City of Peterborough Sanitary Master Plan

VOLUME 2: BACKGROUND AND PLANNING CONTEXT - *DRAFT*

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Sanitary Master Plan for City of Peterborough Class Environmental Assessment (EA) Study Report Outline

This report for the City of Peterborough's Sanitary Master Plan is a comprehensive document that describes the planning, evaluation, and decision-making process for developing the long-term wastewater strategies to service growth in the City of Peterborough to 2051. The master plan documentation is compliant with the requirements of the EA Act and is being placed on public record for the prescribed review period. The Sanitary Master Plan Report is organized into 5 volumes:

Volume 1 – Executive Summary

The executive summary provides a brief overview of the master plan, and summarizes information contained in the subsequent volumes. This includes the problem and opportunity statement, the study objectives, background and planning context, and a description of the preferred servicing strategy and associated capital program.

Volume 2 – Background and Planning Context

Volume 2 describes the master planning process, the legislative and policy planning context, related studies and background information, wastewater servicing principles and policies, population and employment growth forecasts and existing Study Area conditions.

Volume 3 – Sanitary Master Plan

Volume 3 documents the approach to developing the preferred sanitary servicing strategy, including review of the existing system constraints, impacts of growth on system performance, development of servicing concepts and strategies to service growth, evaluation methodologies and criteria, and the results of the evaluation. It also provides a detailed list of proposed projects associated with the preferred strategy, along with an implementation plan that describes phasing and additional studies that may be required.

Volume 4 – Indigenous Engagement

Volume 4 provides a record of all engagement activities with First Nations and indigenous communities. This includes a log of all email and phone correspondence, along with meetings, both in-person and virtual. Finally, a summary of comments provide by Indigenous Communities is provided, that helped to inform the implementation plan and additional required studies described in Volume 3.

Volume 5 – Public and Agency Consultation

Volume 5 contains all relevant documentation of the public and agency consultation process including notices, comments and responses, and distribution information. Presentation materials from both Public Information Centres (PICs) held during the study are included. Additional presentation materials and discussion information from workshops held with relevant agencies, approval bodies and other stakeholders are also included.

This document contains **Volume 2**, which is one of five volumes that make up the complete Sanitary Master Plan Report and should be read in conjunction with the other volumes.

Table of Contents

List of Tables

List of Figures

Appendices

Acronyms and Abbreviations

AMP	Asset Management Plan
BOD	Biological Oxygen Demand
BQRAP	Bay of Quinte Remedial Action Plan
CCME	Canadian Council of Ministers for the Environment
CCTV	Closed-Circuit Television
CHER	Cultural Heritage Evaluation Report
CHR	Cultural Heritage Report
CHSR	Cultural Heritage Screening Report
CHVI	Cultural Heritage Value or Interest
City	City of Peterborough
CLI	Consolidated Linear Infrastructure
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
EA(A)	Environmental Assessment (Act)
ECA	Environmental Compliance Approval
END	Endangered
EPA	Environmental Protection Act
FNWWAP	First Nations Water and Wastewater Action Plan
HIA	Heritage Impact Assessment
I/I	Inflow and Infiltration
MBCA	Migratory Birds Convention Act
MCM	Ministry of Citizenship and Multiculturalism
MECP	Ministry of the Environment, Conservation and Parks
MMAH	Ministry of Municipal Affairs and Housing
MNR	Ministry of Natural Resources
NHS	Natural Heritage System
OP	Official Plan
ORCA	Otonabee Region Conservation Authority
OWRA	Ontario Water Resources Act
Parslow	Parslow Heritage Consultancy Inc
PPS	Provincial Planning Statement
Province	Province of Ontario
PUG	Peterborough Utilities Group
SAR(A)	Species at Risk (Act)
SMP	Sanitary Master Plan
SPS	Sewage Pumping Station
TAZ	Traffic Assessment Zone
THR	Threatened
TM	Technical Memorandum
TMP	Transportation Master Plan
TP	Total Phosphorus
WWTP	Wastewater Treatment Plant

1. Introduction

1.1. Background

The City of Peterborough (the City) has completed a Sanitary Master Plan (SMP) to guide future improvements to all elements of the sanitary system including collection, conveyance, and treatment to meet future capacity needs in alignment with the City's 2023 Official Plan (OP).

The 2023 OP anticipates that the City will grow from a population of 83,000 people in 2016 to a population of 125,000 people by 2051. The City also anticipates growth in employment, aiming to achieve at least 1 job for every 2 residents through 2051. It is anticipated that the employment sector will grow from 45,000 jobs in 2016 to 63,000 by 2051. The City strives to achieve financially responsible and environmentally sustainable growth. This SMP will provide a framework to manage sanitary infrastructure needs to accommodate urban growth and intensification that maximizes use of existing servicing capacity.

The City is responsible for both the sanitary and stormwater systems, while the Peterborough Utilities Group (PUG) was responsible for water servicing when the study began. In 2025, the City assumes control of the water utility. This Master Plan considers sanitary servicing needs only. The City's sanitary system consists of 385 km of gravity sewers, 10 Sewage Pumping Stations (SPS), one by-pass pumping station, 13 forcemains, three siphons, and the Peterborough Wastewater Treatment Plant (WWTP). Additional pumping stations and forcemains are located at Beavermead Park, Peterborough Airport, and 182 Townsend Street. The Peterborough Waste Management Facility has two privately operated SPSs, which are included in the Study Area, shown in **Figure 1-1.**

This volume (Volume 2 – Background and Planning Context) will describe the planning and policy context of the SMP, existing conditions of the Study Area and related studies.

1.2. Problem and Opportunity Statement

At the onset of the study, a problem and opportunity statement was defined as the basis for completing the Sanitary Master Plan, as follows:

> *The City of Peterborough's 2023 Official Plan Update anticipates the City's population will grow from 83,000 people in 2016 to a projected population of 125,000 people by 2051.*
>
> *The City's Sanitary Master Plan will provide a framework for servicing urban growth and intensification that is transparent, sustainable, reliable, environmentally friendly, cost effective, flexible and maximizes use of existing sanitary infrastructure.*

The SMP achieves the following objectives:

- Assesses the capacity of the existing sanitary system, including collection, conveyance, and treatment, and identifies the requirements to continue servicing the existing population while allowing for future development;
- Provides recommendations for short and long-term capital planning to forecast funding requirements and inform any updates to the Development Charges Background Study and DC By-Law;
- Creates a framework for the sanitary servicing of development within the identified Strategic Growth Areas;
- Provides recommendations within an Implementation Plan on how to proceed with the SMP, including a Capital Plan to 2051 and recommendations related to policy, guidance, and operation of the City's Consolidated Linear Infrastructure (CLI) Environmental Compliance Approval (ECA);
- Identifies existing system redundancies, vulnerabilities and risks, and develops a mitigation approach; and
- Engages the public, agencies and First Nations communities throughout the Master Plan process.

Innovative approaches were considered to address the City's need to adapt its infrastructure and operations under a changing climate and plan for infrastructure expansion that is cost-efficient and financially sustainable for the community.

1.3. Study Area

1.3.1. Overview of Study Area

The Study Area encompasses the entirety of the City of Peterborough, as well as Peterborough Airport lands, and Peterborough Waste Management Facility. **Figure 1-1** shows the Study Area boundaries as well as the existing municipal sanitary infrastructure including sewers, sewage pumping stations and the Peterborough WWTP. The City's municipal boundary encompasses approximately 6,000 hectares of land. The Airport and Waste Management Facility lands are located south of the City limits within the Township of Cavan Monaghan and Township of Otonabee-South Monaghan, respectively. Sanitary sewage produced within these lands are received by the City's sanitary system and treated at the Peterborough WWTP.

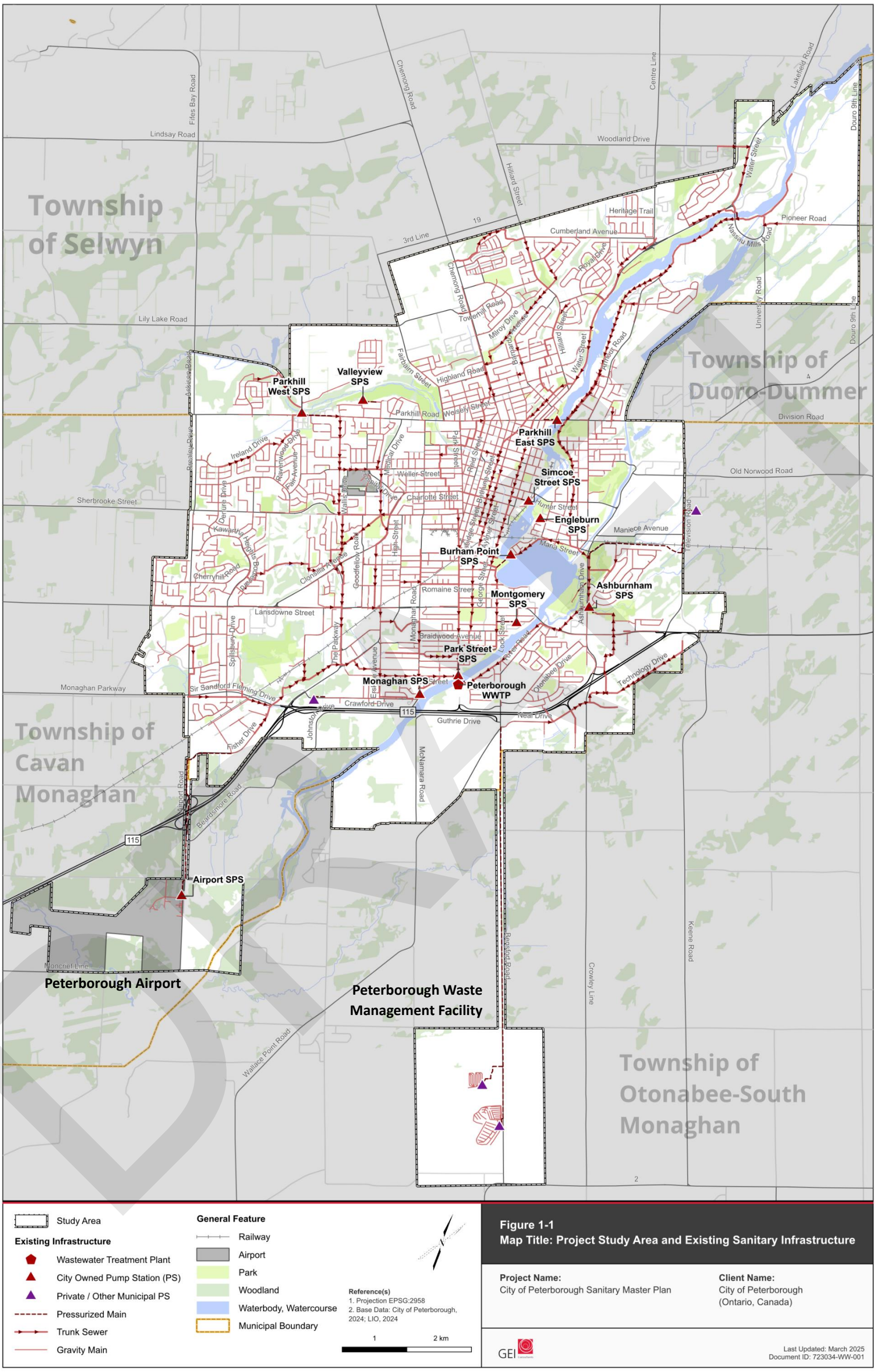


Figure 1-1: Study Area and Existing Sanitary Infrastructure

1.3.2. Urban Structure and Land Use Designations

The Land Use Plan for the City, as described in the 2023 OP, includes Residential, Major Institutional, Major and Minor Mixed-Use Corridor, Major Open Space, Natural Areas, General and Prestige Employment, and Rural Transitional Area designations as well as a Central Area and Coldsprings Special Study Area. Land use designations are illustrated in **Figure 1-3.**

The Central Area, the historic centre of the City, contains the Urban Growth Centre boundary, seven distinct land use designations and Jackson Creek Special Policy Area as shown in **Figure 1-4** (details in **Section 3.6.5**). The 2023 OP also delineated Strategic Growth Areas within the City, including the Urban Growth Centre in the downtown core, and Mixed-Use Corridors along primary transit corridors as shown in **Figure 1-2** and **Figure 1-3.**

Furthermore, the City's 2023 OP identifies Intake Protection Zones around the Otonabee River on the north portion of the municipal boundary in accordance with the approved Trent Source Protection Plan and Assessment Report. Large areas within the City are designated as Significant Groundwater Recharge Areas and contain Highly Vulnerable Aquifers. A small area on the southwest City boundary is designated as a Wellhead Protection Area E.

The Peterborough Waste Management Facility is located within the Township of Otonabee-South Monaghan, in the County of Peterborough. The *County of Peterborough OP* (adopted by Council in 2022 but has not yet been approved by the Minister of Municipal Affairs and Housing (MMAH)) designates the Peterborough Waste Management Facility as a Waste Management Area, surrounded by agricultural, rural and natural core areas. A portion of the Waste Management Facility lands contain floodplain and aggregate resource overlay. This site is not currently designated under the County OP nor the *Township of Otonabee-South Monaghan OP* (2003).

The Peterborough Airport is located within the Township of Cavan Monaghan, in the County of Peterborough. Under the County OP, the Airport has a special airport land use designation and contains natural features including floodplain, significant woodland and non-provincially significant wetland. The site has similar designations under the *Township of Cavan Monaghan OP* (2015).

1.3.3. Key Employment, Residential, Commercial Lands

The City's employment is largely service based. Major institutional employment areas include Trent University, Sir Sandford Fleming College, Ministry of Natural Resources (MNR) and Peterborough Regional Health Centre. The City's 2023 OP identifies a business district designation in the downtown Central Area, which contains diverse clusters of commercial establishments. Three locations along the City boundary are designated as prestige employment and applies to clusters of economic activities such as manufacturing, warehousing, and associated retail along Highway 115 and the rail corridor.

Peterborough is also home to several wet industries, which contribute to the sanitary system, namely Quaker Oats (PepsiCo) in the downtown core and Minute Maid on Lansdowne St West.

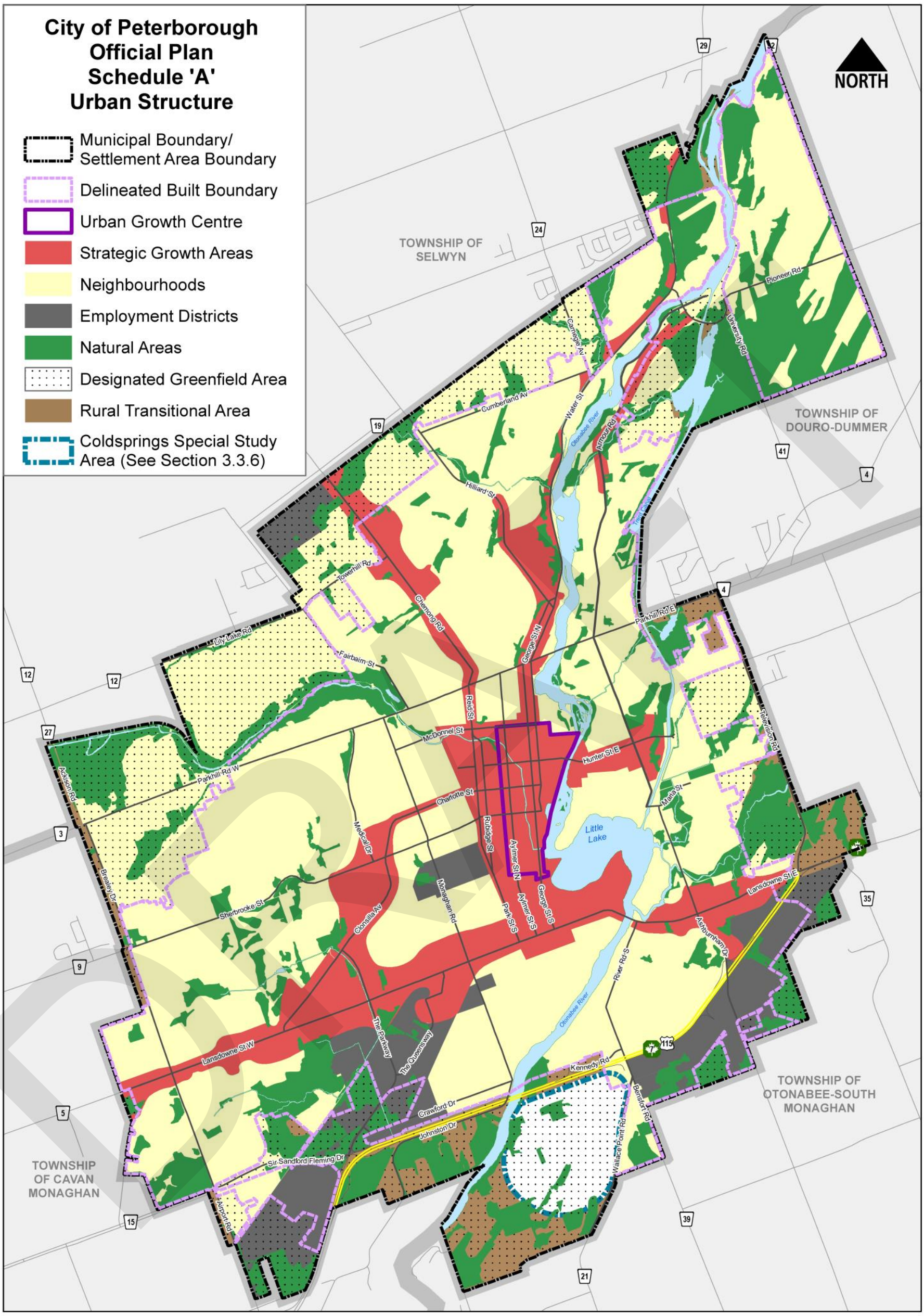


Figure 1-2 Peterborough 2023 Official Plan Schedule 'A' Urban Structure

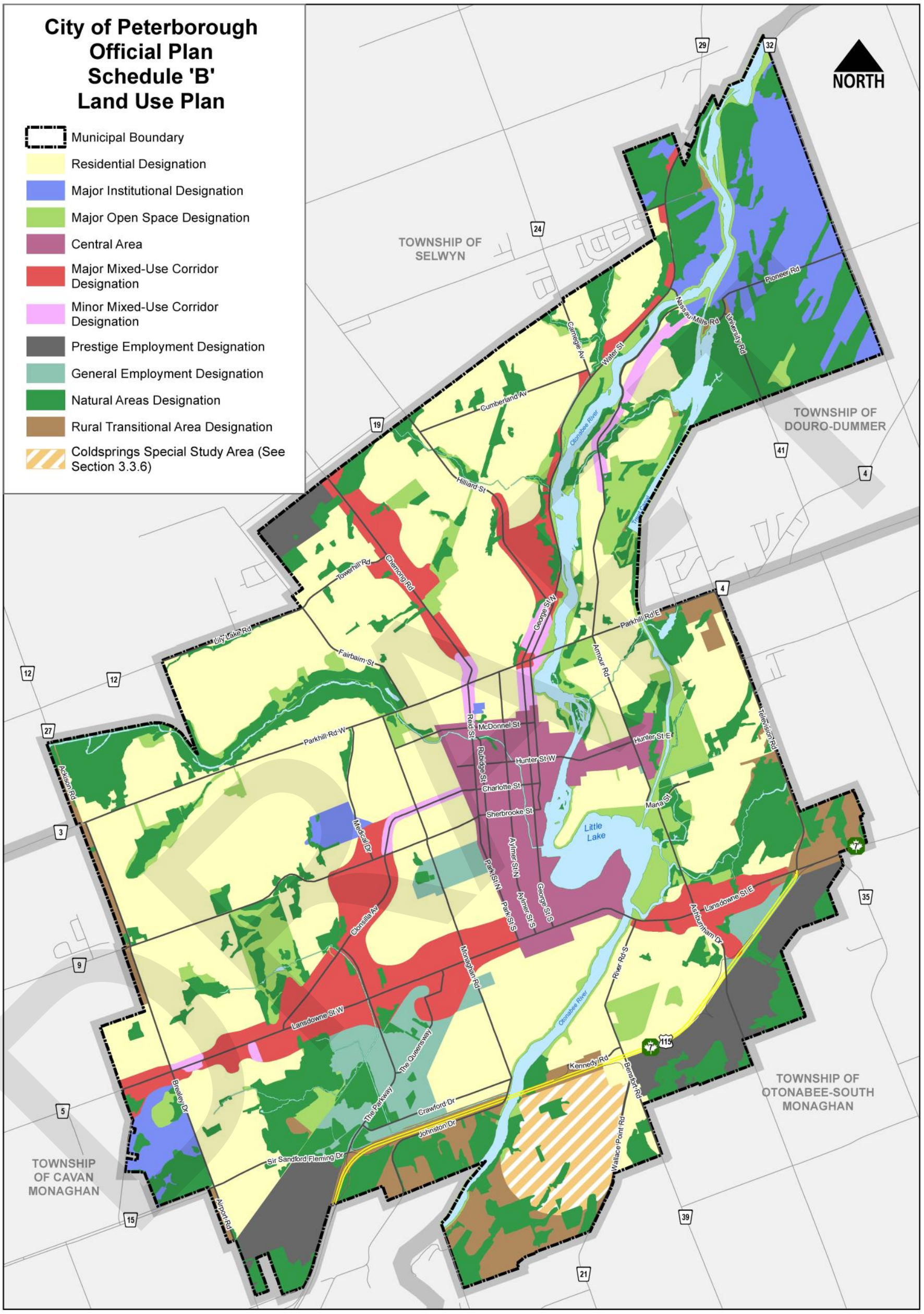


Figure 1-3 City of Peterborough 2023 Official Plan Schedule 'B' Land Use Plan

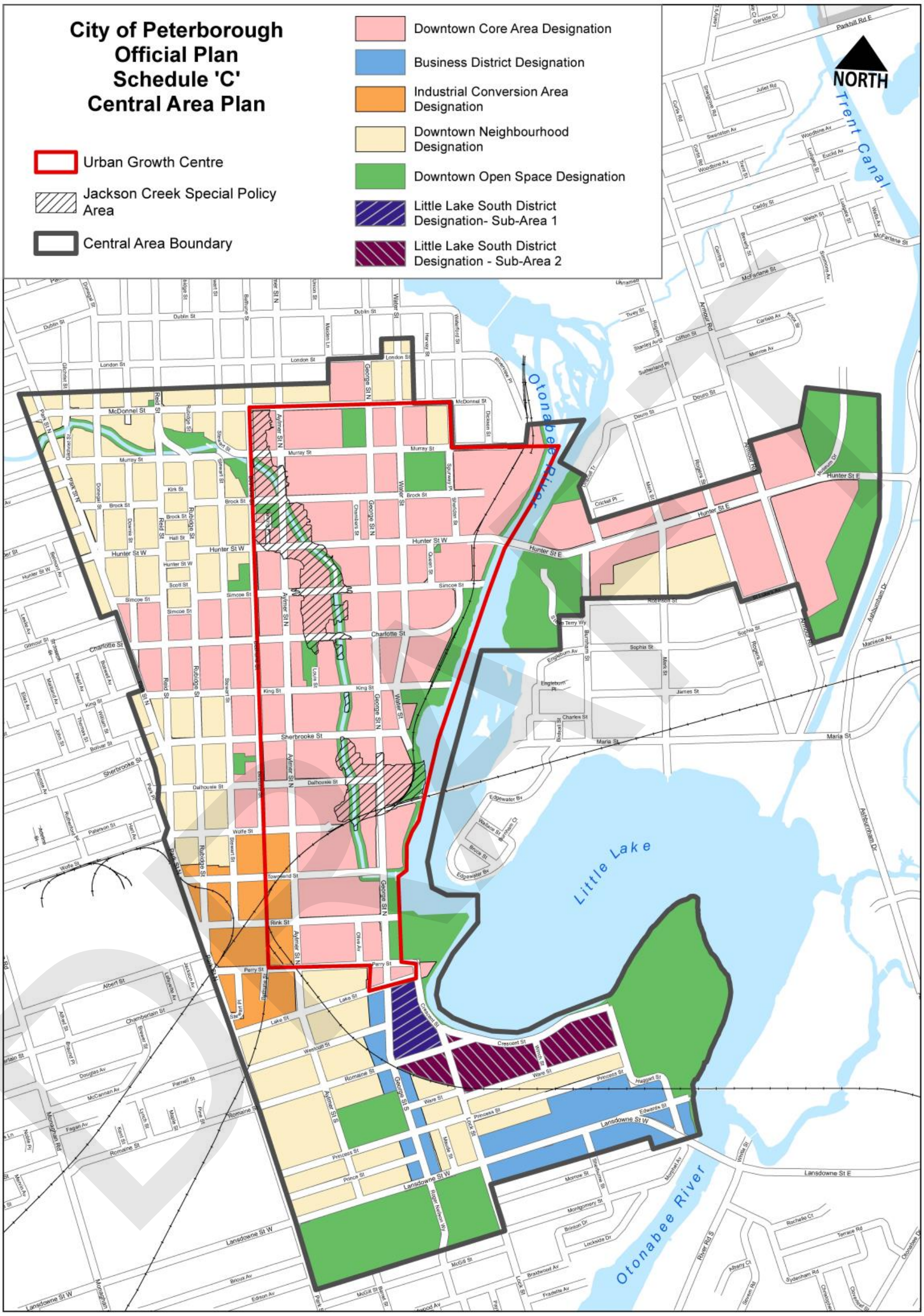


Figure 1-4: City of Peterborough 2023 Official Plan Schedule 'C' Central Area Plan

1.3.4. Special Features and Assets

The Study Area contains special features and assets, which are outlined below:

- **Downtown area** contains shopping, food, entertainment, and other experience opportunities that play an essential role in the cultural life of the City. The downtown area is subject to a number of initiatives focused on the renewal of the City's urban core and community building.
- **Otonabee River** runs through the City from Katchewanooka Lake to Rice Lake and forms part of the Trent-Severn Waterway.
- **Little Lake** is a small lake on the Otonabee River, which is used for fishing, swimming, boating, and a range of significant events. Peterborough's historic downtown opens to Little Lake, providing a scenic waterfront and a marina.
- **Jackson Creek** flows through the developed downtown area and outlets into the Otonabee River at Little Lake. The creek has been significantly altered through the City's urban area. In July 2004, the creek overflowed and caused extensive damage.
- **Trent-Severn Waterway National Historic Site** is a 386 km long waterway first opened in 1922 to connect Lake Ontario to Georgian Bay. Parks Canada maintains and operates the historic lock system as a destination for recreational boaters, paddlers, and local community.
- **Peterborough Lift Lock** was designated a national historic site of Canada because it is the highest hydraulic lift lock in the world. The feature was constructed in 1904 on the Trent-Severn Waterway and holds heritage value for its surviving physical attributes and engineering recognition.
- **Trent University** is situated on the banks of the Otonabee River in the northeastern quadrant of the City, with a student population at the Peterborough campus of approximately 10,500 in 2023. Sanitary flows from the University are higher from September to April, when more students are living on-campus.
- **Sir Sandford Fleming College's** Sutherland Campus is located on the southwest end of the City. The college also has campuses in Lindsay, Cobourg, and Haliburton and has more than 6,800 full-time and 10,000 part-time students.
- **Airport Lands** are located directly south of the City boundary within the Township of Cavan-Monaghan. The airport provides transportation services for emergencies, recreational pilots, charter flight businesses, aviation education, etc.
- **Peterborough Waste Management Facility** is a landfill facility located in the southeastern portion of the Study Area at 1260 Bensfort Rd. in the Township of Otonabee-South Monaghan, approximately 6 km south of the City limits and within County of Peterborough. This facility is jointly owned by the City and County and is operated under a contract by R.W. Tomlinson Ltd. Leachate from this landfill is discharged via forcemain to the sanitary sewer and eventually treated at the Peterborough WWTP.

1.3.5. Natural Environment

A desktop Natural Heritage Background Review of the Study Area was completed by GEI Consultants in March 2025; the report is provided in **Appendix A1**. This review was intended to identify any constraints related to natural heritage features that may impact development or infrastructure projects and to determine the need for further detailed area studies. The Study Area is located within the ORCA jurisdiction and key considerations for natural heritage features related to planning for infrastructure servicing are identified in **Section 4**.

A summary of nature heritage features that were recorded through background review in or within 120 m of the Study Area are summarized below. Maps of the features are provided in the Natural Heritage Review report.

- **Natural Heritage Systems**: natural area, waterbodies/watercourses, regional connections and proximity linkages within the City are mapped within each of the Official Plans.
- **Woodlands**: numerous woodland units and hedgerows are present. Additional woodlands, including those that are significant may also be present.
- **Provincially Significant Wetlands**: Nassau Wetland Complex, the Loggerhead Marsh, Harper Creek Wetland, Cold Springs and Yankee Bonnet Wetland, Peterborough Airport Wetland Complex, Otonabee Midriver Complex, Downer's Corners Provincially Significant Wetland, Jackson Creek Provincially Significant Wetland, Jackson Creek East Provincially Significant Wetland, and the Kiiktaanaa Mash'ing Wetland Complex.
- **Other Wetlands**: numerous other evaluated wetlands including the Burnham Wood, Otonabee River Floodplain Swamp Complex, Cavan Creek Outlet Swamp, Crystal Springs Wetland Complex, as well as unevaluated wetlands.
- **Watercourses**: the Otonabee River and its associated tributaries is the main watercourse flowing through the Study Area. Watercourses in this watershed include warm and cold thermal regime creeks and streams. There are several small, naturally occurring waterbodies including Lily Lake and Little Lake.
- **Significant Valleylands**: Otonabee River Valley and Jackson Creek Valley are identified within the City of Peterborough Official Plan.
- **Other Valleylands**: may be associated with the larger watercourses identified above.
- **Fish Habitat**: Harper Creek contains a unique coldwater urban Brook Trout system. Other fish habitat is not identified within the Official Plans but is assumed to occur within the aquatic features present (watercourses, waterbodies, wetlands, etc.).
- **Areas of Natural and Scientific Interest**: none identified.
- **Linkages**: regional and proximity linkages are identified in the City of Peterborough Official Plan.
- **Minimum Vegetation Protection Zones**: may be associated with the natural heritage features listed above.

Rare species on or within 120 m of the Study Area were identified from a search of federally and/or provincially significant plants, vegetation communities and wildlife databases. Records identified rare

species of birds, insects, fish, reptiles/amphibians, and plants on or adjacent to the Study Area. Of these records, 16 species were listed as Endangered and 11 as Threatened on the Species at Risk (SAR) in Ontario list.

The Natural Heritage Background Review report screened seven proposed projects for ecological constraints. Where ecological constrains are present, a list of additional studies, and permitting and approvals required has been included. For some projects, where the complete avoidance of natural features is not possible, appropriate site-specific studies may be required. This may include field data collection to confirm the extent of natural heritage features where servicing projects are proposed. Additional studies that have been identified include fish community assessments, Ecological Land Classification, species at risk and significant wildlife habitat screenings, tree inventories, and the verification of boundaries of wetlands and woodlands. Supporting reports that have been identified include arborist reports, sediment and erosion control plans, environmental impact studies, and municipal class environmental assessments. Permits and approvals may be required from ORCA, MECP, MNR, or the Department of Fisheries (DFO).

Further engagement with Williams Treaty First Nations will also allow for further refinement and understanding of preliminary constraints, followed by appropriate site-specific field data collection to confirm the extent of natural heritage features where servicing projects are proposed.

1.3.6. Socio-economic and Cultural Environment

1.3.6.1. Cultural Heritage Screening

A draft Cultural Heritage Screening Report (CHSR) for the Study Area was completed by Parslow Heritage Consultancy Inc (Parslow) in November 2023 and is included in **Appendix A2**. The report determined that the Study Area contains a substantial number of properties that exhibit cultural heritage value or interest represented by a mix of Listed Heritage Properties, Designated Heritage Properties, a Heritage Conservation District, and a number of known cemeteries and Indigenous burial sites. The Study Area also contains undocumented properties of potential cultural heritage value. **Figure 1-5** provides an overview of heritage features within the Study Area; the CHSR contains detailed maps of 16 key areas.

The provincial Bill 23, *More Homes Built Faster Act* 2022, proposed amendments to the Ontario Heritage Act, which were proclaimed into force in January 2023. One of the significant impacts of the amendments is a two-year time limitation on the listing of heritage properties. Listed (i.e., non-designated) properties currently included on a municipal register would have to be removed if council does not issue a notice of intention to designate within two years of the amendments coming into force.

In general, potential impacts to heritage resources due to ground disturbing work are deemed low as long as activities are confined to the municipal road right-of-way. However, Parslow's CHSR, as well as the Ministry of Citizenship and Multiculturalism (MCM), recommended that a Cultural Heritage Report (CHR): Existing Conditions and Preliminary Impact Assessment be completed for the proposed capital projects within the Study Area. The CHR, completed in March 2025 by Peninsula Heritage Inc, identified mitigation options, as required, based on the preliminary evaluation of potential impacts. For example, a pre-construction vibration assessment and vibration monitoring during construction is recommended for future projects that are near built structures that may have cultural heritage value, to be confirmed

through further field investigations or assessments. The CHR notes Cultural Heritage Evaluation Report (CHER) or a Heritage Impact Assessment (HIA) should be initiated:

- For site-specific undertakings where there may be impacts to both known and potential built heritage resources and cultural heritage landscapes, a CHER should be prepared to determine whether the property has cultural heritage value or interest (CHVI).
    - If the property (or project area) is determined to be of CHVI and alterations or development is proposed, an HIA be undertaken to assess potential project impacts.

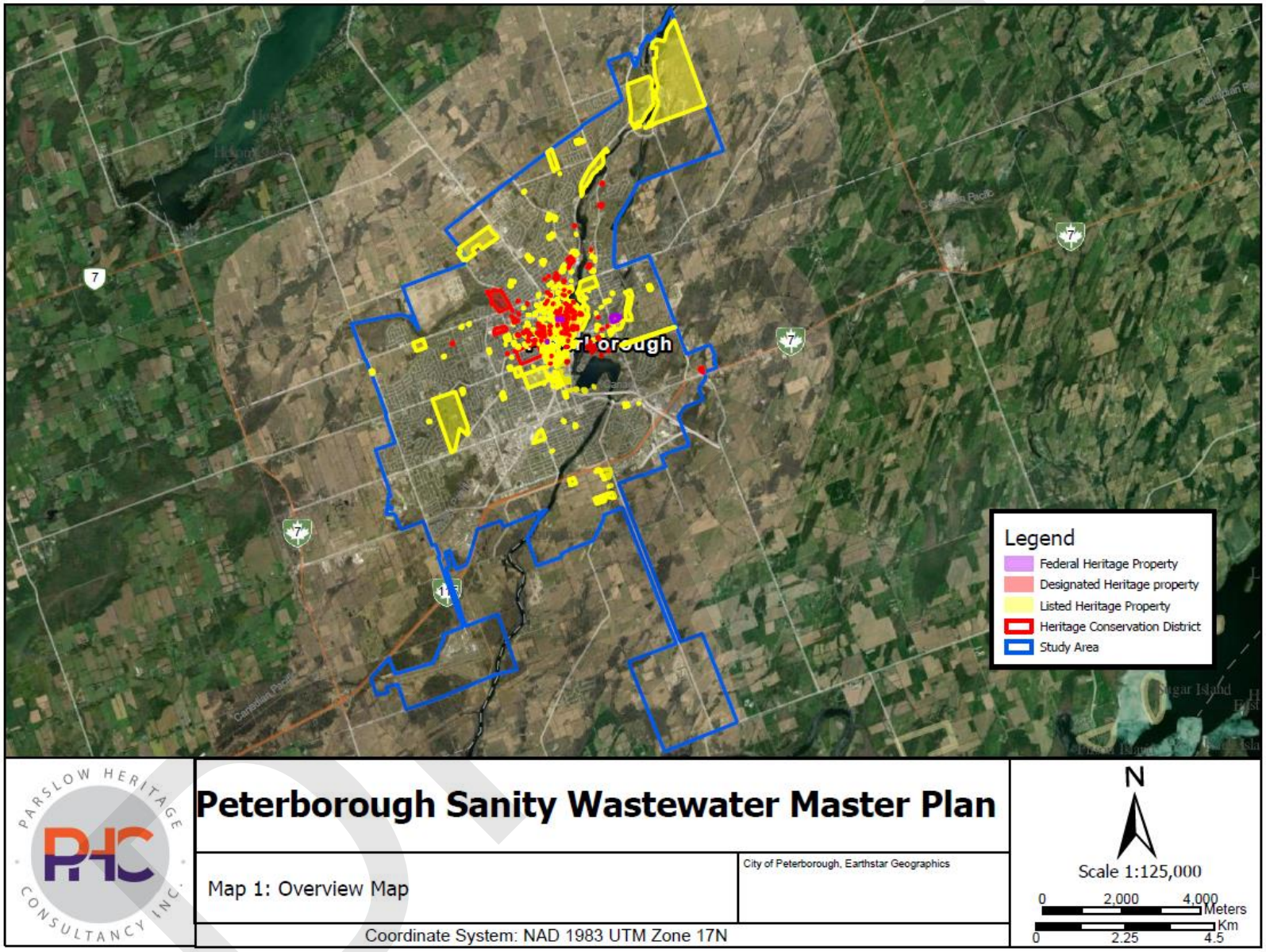


Figure 1-5: Overview Map of Cultural Features

1.3.6.2. Archaeological Assessment

A draft Stage 1 Archaeological Assessment for the Study Area was completed by Parslow in November 2023 and is included in **Appendix A3**. The assessment identified over 100 registered archeological sites, which are known to have significant cultural heritage value or interest. To determine locations where unrecorded archaeological sites are most likely to be found, locations of archeological sites, historic transportation routes, and watercourses were consolidated to map the archeological potential within the Study Area and adjacent 1 km, as shown in map in **Figure 1-6**.

Recommendations of the draft Stage 1 Archaeological Assessment include completing a Stage 2 Archeological Assessment for portions of the Study Area that retain archaeological potential prior to future ground disturbance. Since portions of the Study Area identified as disturbed could have remaining archeological soils, additional Stage 2 Archeological Assessment or construction monitoring is required to make determinations about the severity of previous impacts as they relate to archaeological potential assessments.

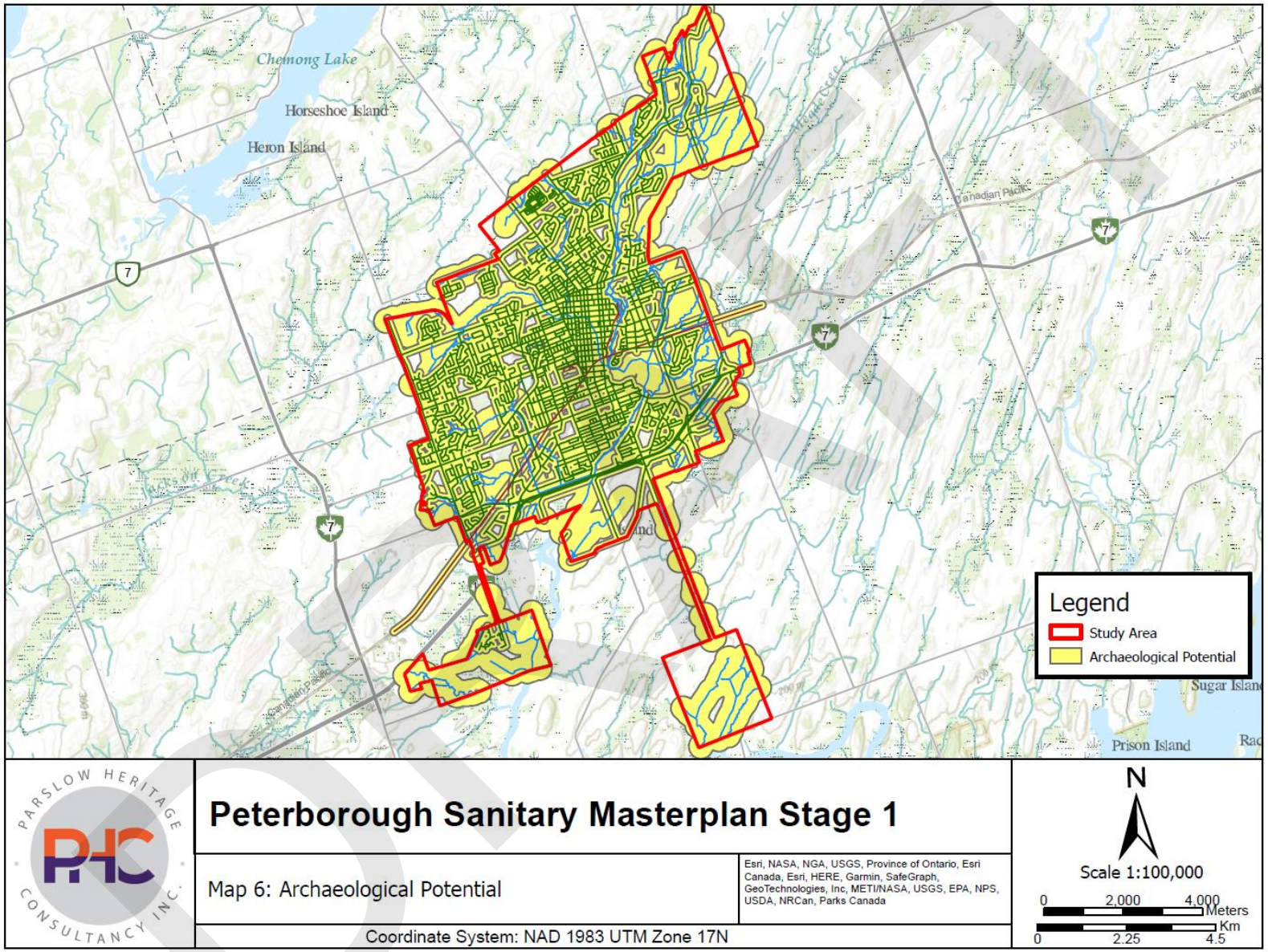


Figure 1-6: Archeological Potential Map Overview of Study Area and Adjacent 1 km Area

2. Master Planning Process

2.1. Environmental Assessment Act

The *Environmental Assessment Act* (EAA), 1990 (amended 2024) has the purpose of the betterment of the people of Ontario by providing for the protection, conservation and wise management of the environment. It outlines three general pathways for a project, a Class Environmental Assessment, a Comprehensive Environmental Assessment, and a Streamlined Environmental Assessment (not yet enforced). The Class Environmental Assessment is further subdivided into several categories, including the Municipal Class Environmental Assessment, which is the process generally used for municipal infrastructure and servicing projects.

An EAA must ensure that decisions result from a rational, objective, transparent, replicable, and impartial planning process. As set out in Section 17.6 (2) of the EAA, an EA document must include a description of the following:

- The purpose of the undertaking;
- The alternative methods of carrying out the undertaking; and,
- Alternatives to the undertaking.

The EA document must also include a description of:

- The environment that will be affected or that might reasonably be expected to be affected, directly or indirectly, by the undertaking or alternatives to the undertaking;
- The effects that will be caused or that might reasonably be expected to be caused to the environment by the undertaking or alternatives to the undertaking;
- The actions necessary or that may reasonable be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment by the undertaking or alternatives to the undertaking;
- An evaluation of the advantages and disadvantages to the environment of the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking; and,
- A description of any consultation about the undertaking and the results of the consultation. (EAA, R.S.O.1990, c. E.18, s.17.6(2)).

2.2. Principles of Environmental Planning

The EAA sets a framework for a rational, objective, transparent, replicable and impartial planning process based on the following five key principles:

1. **Consultation with affected parties.** Consultation with the public, government review agencies and First Nations is an integral part of the planning process. Consultation allows the proponent to identify and address any concerns cooperatively before final decisions are made. Consultation should begin as early as possible in the planning process.

2. **Consideration of a reasonable range of alternatives**. Alternatives include functionally different solutions, "alternatives to" the proposed undertaking and "alternative methods" of implementing the preferred solution. The "do nothing" alternative must also be considered.
3. **Identification and consideration of the effects of each alternative** on all aspects of the environment. These aspects include the natural, social, cultural, technical and economic environments.
4. **Systematic evaluation of alternatives** in terms of their advantages and disadvantages to determine their net environmental effects. The evaluation shall increase in the level of detail as the study moves from the evaluation of "alternatives to" to the evaluation of "alternative methods".
5. **Provision of clean and complete documentation** of the planning process followed to allow "traceability" of decision-making with respect to the project. The planning process must be documented in such a way that it may be repeated with similar results.

2.3. Municipal Class Environmental Assessment

Municipal Class EAs were approved by the Minister of the Environment in 1987 for municipal projects having predictable and mitigable impacts. The Municipal Class EA process was revised and updated in 1993, 2000, 2007, 2011, 2015, 2023 and 2024. This Class EA will follow the 2024 Class EA process. The Class EA approach streamlines the planning and approvals process for municipal projects that are:

- Recurring;
- Similar in nature;
- Usually limited in scale;
- Predictable in the range of environmental impacts; and,
- Responsive to mitigation.

The Municipal Class EA outlines the procedures to be followed to satisfy Class EA requirements for water, wastewater, stormwater management and road projects. The process includes five phases:

1. **Phase 1:** Problem or Opportunity Definition;
2. **Phase 2:** Identification and Evaluation of Alternative Solutions to Determine a Preferred Solution while taking input from the public and other stakeholders into consideration;
3. **Phase 3:** Examination of Alternative Methods of Implementation of the Preferred Solution while taking input from the public and other stakeholders into consideration;
4. **Phase 4**: Documentation of the Class EA process in the form of an Environmental Study Report for public review; and
5. **Phase 5:** Implementation and Monitoring.

Public and agency consultation are integral to the Class EA planning process. Projects subject to the Class EA process are classified into the following four categories depending on the extent of the expected impacts. The Class EA Phases 1 to 4 support Phase 5 which includes the implementation of the preferred

solution pre-construction, the construction of the solution and any monitoring required during and post-construction. **Figure 2-1** illustrates the Municipal Class EA planning and design process with the associated phases.

2.3.1. Project Schedules

Projects subject to the Class EA process are classified into the following four "schedules" depending on the degree of the expected impacts.

- **Exempt projects** (formerly classified as Schedule A and A+ projects) include various municipal maintenance, operational activities, rehabilitation works, minor reconstruction or replacement of existing facilities, and new facilities that are limited in scale and have minimal adverse effects on the environment. These projects are exempt from the requirements of the EAA.
- **Eligible for Screening to Exempt** projects are based on the results of a screening process. Proponents may choose to complete the applicable screening process to determine whether their project is eligible for exemption from the EAA or proceed with the applicable Schedule 'B' or 'C' process.
- **Schedule B** projects have the potential for some adverse environmental effects. The proponent is required to undertake the first two phases of the assessment process, involving mandatory contact with directly affected public and relevant review agencies, to ensure that they are aware of the project and that their concerns are identified and considered. A Project File must be prepared and made available for review by any interested person or party. If there are no outstanding concerns, then the proponent may proceed to implementation once the regulatory process has been completed. Schedule 'B' projects generally include improvements and minor expansions to existing facilities or smaller new projects.
- **Schedule C** projects have the potential for more significant environmental effects than a Schedule 'B' project and as such a proponent is required to complete the full planning and documentation (phases 1 through 4) of the assessment process. For Schedule 'C' projects, proponents are required to prepare an Environmental Study Report for review by the public and review agencies. If there are no outstanding concerns, the proponent may proceed to implementation once the regulatory process has been completed. Schedule 'C' projects generally include the construction of new facilities and major expansions to existing facilities.

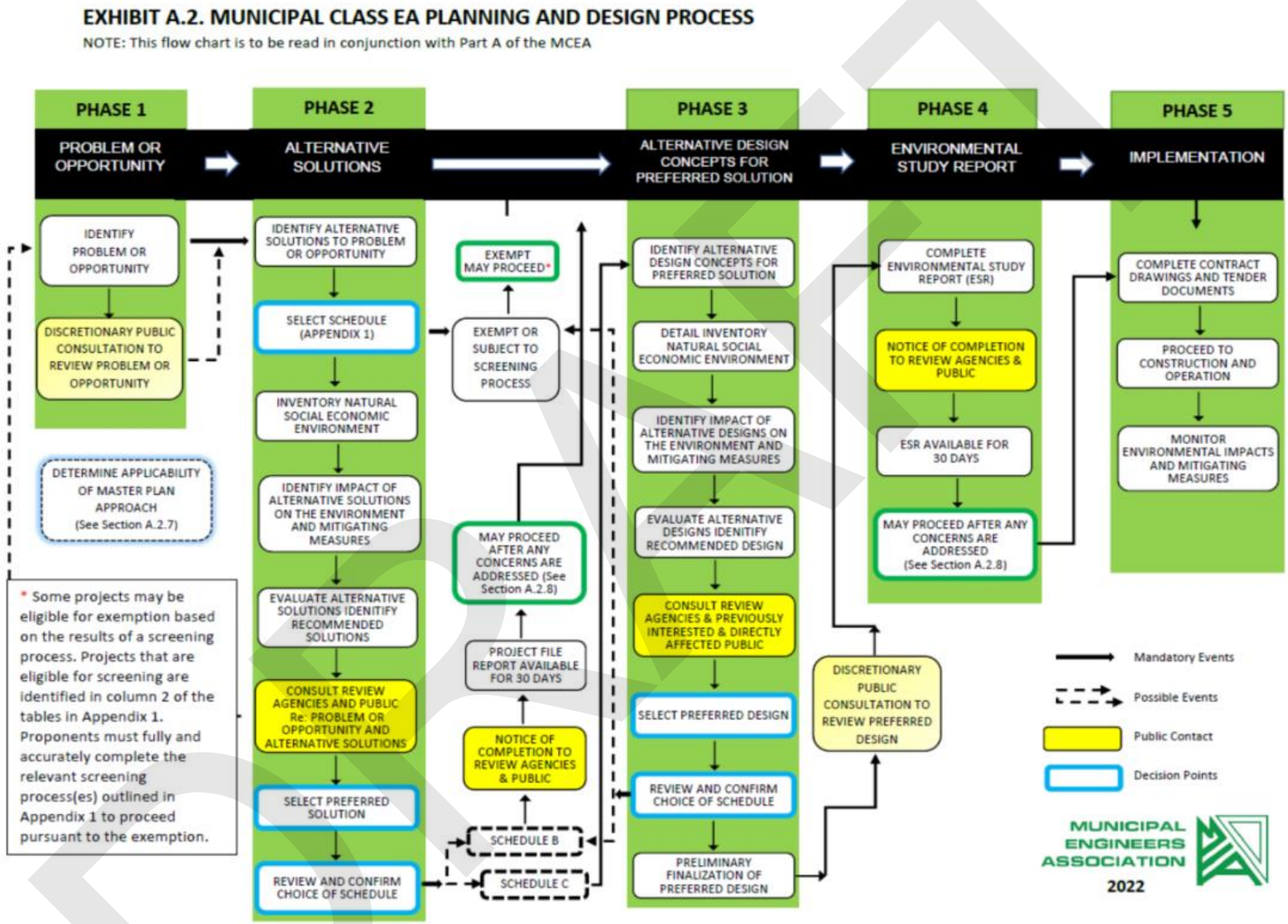


Figure 2-1: Municipal Class EA Process (from MCEA 2024 Amendment)

2.3.2. Master Planning Process

Master plans have distinguishing features that set them apart from project specific studies. These features include the following:

- Master plans are broad in scope and focus on the analysis of a system for the purpose of outlining a framework for the provision of future works and developments; and,
- Specific projects recommended in a master plan are part of a larger management system and are distributed geographically throughout the Study Area. The implementation of specific projects may occur over an extended time frame.

A master plan must at least satisfy the requirements of Phases 1 and 2 of the Class EA process and incorporate the five key principles of environmental planning, as identified in **Section 2.2**. The master plan must document public and agency consultation at each phase of the process and a reasonable range of alternative solutions must be identified and systematically evaluated.

The SMP follows the modified Approach #2 for Master Plan projects as established by the Municipal Engineers Association Class EA process (October 2000, as amended in 2007, 2011, 2015, 2023 and 2024). This approach satisfies the requirements of Schedule 'B' projects required within the next 10 years so they may move forward to design and construction unless otherwise noted. The SMP was prepared as a broad level assessment and recognizes that further detailed assessment will be required through separate studies to satisfy project specific fulfillment of the Municipal Class EA requirements for Schedule 'B' projects required beyond the 10-year horizon and all Schedule 'C' projects.

Table B of the Municipal Engineers Association 2024 Municipal Class EA Guideline outlines the screening criteria for municipal wastewater projects. Row 22a-c reflect projects that "*establish, extend, or enlarge a sewage collection system and all works necessary to connect the system to an existing sewage outlet*". Where all facilities are located within an existing road allowance or an existing utility corridor AND trenchless technology is used for all water crossings, the project is exempt (Row 22b). Where facilities are not located within an existing road allowance, or existing utility corridor, these projects are considered a Schedule 'B'. Watercourse crossings for the purpose of water and wastewater projects have been defined as: "*a sewage, stormwater management or water facility or a component thereof, which crosses over, under or through a naturally occurring water body or surface drainage feature such as a lake, swamp, marsh, bay, river, creek, stream or man-made drainage facility such as a ditch, canal or municipal drain*" under the Municipal Class EA guideline.

At the conclusion of the SMP, a Section 16 Order can be requested for Schedule B projects if a person believes that this request may prevent, mitigate or solve an outstanding concern that the preferred solution may have a potential negative impact on constitutionally protected Indigenous lands and treaty rights.

3. Related Studies and Background Information

3.1. Asset Management Plan

Asset management planning provides a means of guiding investment decisions to meet key strategic and operational goals and define level of service objectives. The latest Asset Management Plan (AMP) was completed in 2024 by GEI Consultants Canada. The AMP noted that the City currently meets all regulatory/legislated requirements relating to provision of services. The City's sanitary system infrastructure has a replacement cost of $1.9 billion (2023) and has an overall good condition. The current level of service targets for the City's sanitary system are summarized below:

- The sanitary collection and treatment system will protect the environment, public and property, with a target of all properties to be connected to the wastewater system.
- Sanitary flow does not pose a risk to health and safety of the public, demonstrated through no sewer back-ups onto private property;
- Reliable sanitary service is provided with minimal public impact demonstrated by no odour complaints, zero WWTP by-passes, and compliance with the WWTP's ECA effluent limits and objectives;
- The sanitary sewers shall be resilient to impacts of inflow and infiltration (I/I), demonstrated through removing cross-connections between the storm and sanitary systems.

The recommendations in this SMP shall be in alignment with Level of Service targets as defined in the 2024 Asset Management Plan.

3.2. Central Area and Mixed-Use Corridors Urban Design Guidelines

In 2023, the City adopted the Central Area Urban Design Guidelines and Mixed-Use Corridors Urban Design Guidelines. Urban Design Guidelines are non-statutory statements which are general rules and recommendations to provide greater clarity on urban design, streetscapes, built form, and sustainability initiatives. The Urban Design Guidelines provide additional considerations for defined Character Areas in the Central Area and corridors., which have unique characteristics and historical significance. Relevant guidelines for green infrastructure and buildings focus on designing for energy and resource conservation, use of third-party certifications, and use of recycled or reclaimed materials for new infrastructure. Sewer heat recovery was identified as an energy conservation consideration.

Recommendations in this SMP related to projects in the Central Area and associated corridors should consider requirements of the above referenced Urban Design Guidelines.

3.3. Flood Reduction Master Plan

In 2005, the City completed a Flood Reduction Master Plan in response to the severe rainfall and flooding event that occurred in July 2004 which caused significant property damage. In addition to insufficient storm sewer capacity, this study also linked flooding to stormwater and groundwater entering the sanitary system and exceeding its capacity. Although not verified through the Flood Reduction Master Plan, this water was believed to enter the sanitary system through foundation drains, roof leader connections, and through aging pipes and maintenance holes, known as I/I.

At the time of the Flood Reduction Master Plan, during 'dry' weather, the Peterborough WWTP received approximately twice the volume of wastewater compared to the water usage by residents based on water meter readings. Under wet weather conditions, the volume of wastewater received at the WWTP was approximately six times the potable water delivered. Flow monitoring under this study identified the areas with the highest inflow to be the City's downtown core and East City that have older pipes and are generally closer to the river. Key recommendations of this study related to the sanitary sewer system include:

- Sewer System investigation (i.e., flow monitoring, dye testing, smoke testing, closed-circuit television (CCTV)) to identify sources of I/I;
- Detailed Class EAs for reduction in basement flooding;
- Review/Update Development Standards; and,
- Reduce I/I through disconnecting foundation drains, sealing maintenance hole covers, and installing backflow preventors.

Key subsequent studies undertaken by the City as recommended in the Flood Reduction Master Plan are detailed below.

3.3.1. Jackson Creek Flood Reduction Master Plan and Diversion Project

In 2010, the City completed the watershed specific Jackson Creek Flood Reduction Master Plan as recommended by the City-wide Flood Reduction Master Plan. The study investigated flood and damage potential in the City from Jackson Creek and overall options to reduce it. A diversion storm sewer to the Otonabee River was determined to be the preferred alternative to mitigate damages from flooding in Jackson Creek for up to the 100-year storm event. To reduce flooding and flood damages from the urban drainage systems, the preferred solution consisted of a combination of upgrading selected storm sewers, adding catch basins and relief sewers, and re-grading areas to contain the major system flows.

The Jackson Creek Diversion Project Environmental Study Report was completed in 2014 to determine a preferred diversion sewer alignment to reduce flood potential in the City's downtown core. An alignment along Bethune Street was the preferred design selected for its ease of construction and potential for coordination with other projects.

3.3.2. Detailed Sanitary Sewer EA for the Mitigation and Management of Extraneous Flows into the Sanitary System

As recommended in the Flood Reduction Master Plan, the City completed a detailed Schedule 'B' Class EA in 2012 to review alternatives to reduce I/I in their sanitary system. The study recommended focusing I/I reduction efforts in two areas with high flood risk, close to the Otonabee River. For other areas of the City, it was suggested to increase sewer conveyance capacity and add inline storage to better manage peak flows and reduce the risk of potential sewage bypasses to the Otonabee River. It was also recommended to increase the capacity of I/I storage at the Peterborough WWTP.

Results of this study are considered under this SMP in assessing potential for additional I/I reduction measures.

3.3.3. Stormwater Quality Management Master Plan

The Stormwater Quality Management Master Plan was completed in 2014 to help the City reduce the amount of pollution carried by the municipal storm drainage system to local creeks and the Otonabee River. The study primarily provides recommendations related to the operation, improvement, management, and funding of stormwater infrastructure. Four potential sites for new end of pipe stormwater treatment facilities were identified on City property.

Stormwater discharge quality to the Otonabee River has potential to impact future effluent quality criteria requirements for the WWTP, as both types of discharge will impact the water quality in the river.

3.4. Transportation Studies

This section summarizes the recent transportation studies that should be aligned with SMP recommendations for areas of potentially overlapping projects.

3.4.1. City of Peterborough Transportation Master Plan

The City of Peterborough Transportation Master Plan (TMP) was completed in June 2023 and replaced the 2012 Comprehensive Transportation Plan. The TMP was developed to identify solutions in response to population and employment growth the City can expect by the year 2051 and focuses on achieving more sustainable modes of transport. The TMP was coordinated with the County's TMP and adjacent municipalities.

The TMP's Active Transportation strategy primarily consists of enhancing the cycling network based on the City's Cycling Master Plan (2022). Details and maps on the recommended cycling network are included in the TMP. The Transit Improvements strategy primarily consists of increasing service frequency along key corridors and introducing transit priority measures to make transit travel faster and more reliable to ultimately make it more competitive than automobiles. The TMP provides details and maps on the proposed transit and cycling network. The City is also completing a Transit Route Review & Long-Term Growth Strategy as a separate study.

The TMP's implementation strategy is to focus on policy directives that strive to promote sustainable modes of travel, create safer roads for pedestrians, cyclists, and vehicles operations, and improve overall travel flow with enhanced streetscapes.

The TMP's Road Network Improvements strategy focuses on improvements that support growth and improve safety. The approach to growth management is to build upon or improve existing infrastructure, while the safety improvements approach involves intersection operations and turning lanes improvements. The TMP identifies four Special Study Areas that require coordination with other levels of government to complete additional detailed studies to determine the preferred improvements, as shown in **Figure 3-1.**

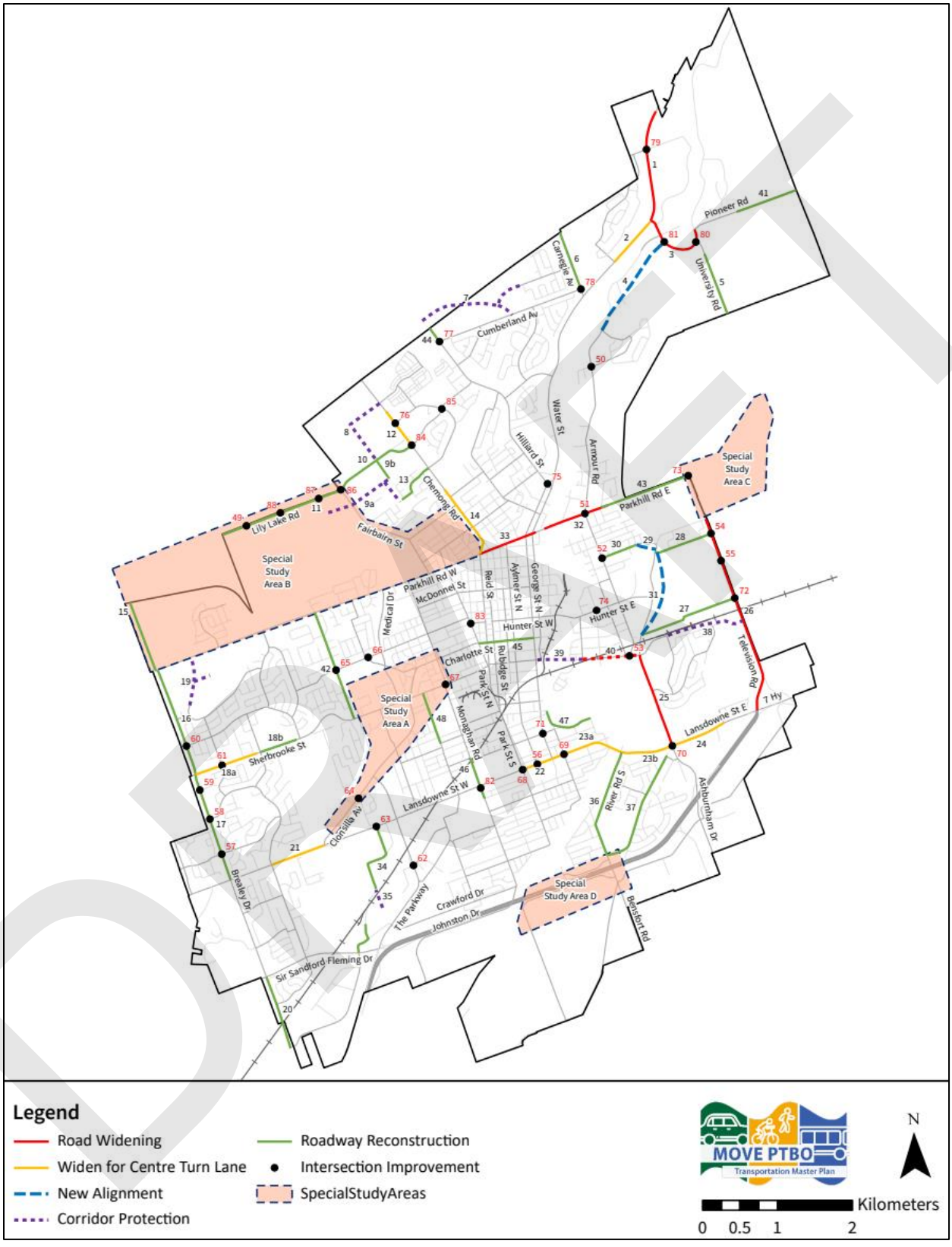


Figure 3-1 Recommended Road Network Improvements to Support Growth by 2051 (TMP, 2023)

3.4.2. Peterborough Eastside Transportation Study

The City completed the Eastside Transportation Study in July 2023 to identify transportation solutions for the area, which is projected have significant growth and lacks sufficient connections across the river and the Trent-Severn Waterway. The eastside area has been identified as Special Study Area in the TMP. The study includes road network, active transportation, and transit strategies, some of which include intersection improvements, road widening, and new waterway crossings. Of note, improvements to County Road 4 to accommodate future demand were identified along with widening of Televison Road, Nassau Mils Road, and improvements to University Road. Since County Road 4 is under the County of Peterborough jurisdiction, implementing proposed solutions will require coordination with the County and local Townships.

3.5. Municipal Cultural Plan

The Municipal Cultural Plan, completed in 2012, is a master plan for use by the City in directing its investment in culture and for identifying municipal priorities. The plan identifies seven strategic directions, some of which include:

- Strengthening the region's waterways, cultural, and natural heritage by protecting the natural environment and historic features, maintaining public access to water, and considering impacts of development and infrastructure; and,
- Strengthening heritage by protecting archeological resources, capitalizing on community consultation processes, and asking the public to consider cultural aspects of an undertaking.
- Recommended projects under this SMP need to consider potential to impact cultural heritage features, including designated heritage properties and heritage conservation districts.

3.6. Area Studies

3.6.1. Peterborough Airport

The City initiated the Peterborough Municipal Airport Sanitary Investigation and Pumping Station / Forcemain Upgrades Class EA (Schedule 'B') in 2016 to study the existing sanitary infrastructure and identify future servicing needs. The study included both the existing SPS and the forcemain that discharges to the City's sewer system, eventually flowing into the Peterborough WWTP. The current Airport SPS is under capacity and servicing upgrades are required to provide for the long-term growth and development at the Airport. The scope of the study was updated to include the investigation of the existing potable water services and identify future water supply requirements and solutions. The City has been assessing options to service the Airport and has identified multiple potential linear infrastructure alignments to connect the existing services at the Airport to existing infrastructure at Fisher Drive.

The Peterborough Airport Master Plan, completed in 2022, identified that airport servicing costs related to the airport pumphouse generator replacement, water and sewer upgrades, fire regulation requirements and water pumping station upgrades account for a significant proportion of capital funding requirements in the short term, estimated at almost $22 million.

3.6.2. Little Lake Area

The Little Lake and Area Master Plan was completed in 2010 for public and private lands surrounding the Otonabee River and Little Lake in the City. Little Lake is a distinctive resource in the heart of the City's urban area, is adjacent to the downtown core, and is an important node on the Trent-Severn Waterway. The 20-year plan visioned to set a new standard for environmental stewardship that focuses on enhancing trails and natural spaces, consolidating cultural facilities, restoration of facilities and play spaces. The plan contains mapping that identifies opportunities for shorelines, habitat, vegetation, and anchored wetlands restoration, as well as stormwater outfall bioswale opportunities.

3.6.3. North End/ Trent University

The North End – Trent University Area Municipal Class EA (Schedule 'C') is an ongoing study which will address various transportation and wastewater upgrades and improvements, including:

- Realignment of Armour Road, north of Cunningham Boulevard;
- Reconstruction or realignment of the Nassau Mills Road bridges over the Otonabee River and Trent-Severn Waterway;
- Development of short-term and long-term solutions to address emerging traffic congestion along Nassau Mills Road and Water Street;
- Development of a stormwater management plan and a sanitary sewage servicing plan; and,
- Improvements to University Road within the City of Peterborough.

A preliminary review of the natural environment existing conditions identified various natural heritage features including the Nassau Provincially Significant Wetland Complex, areas of natural and scientific interest, significant woodlands, unevaluated wetlands, and Significant Wildlife Habitat. Two species at risk (SAR) were also identified, but no aquatic habitat conditions of concern or aquatic SAR were identified.

The SMP will review growth components related to the North End – Trent University Area which will help to determine sanitary needs to be addressed as part of this Class EA.

3.6.4. Coldsprings Development Area

The Coldsprings Development Area is located along the southern limit of the City, south of Highway 7 and east of the Otonabee River. The area is approximately 280 hectares in size, consisting of primarily agricultural land use and single-family residences. These lands were annexed from the Township of Otonabee-South Monaghan in 1998 and were amalgamated with the City of Peterborough in 2008.

A Functional Planning Study for the Coldsprings Planning Area was completed in 2010 to provide a comprehensive review and analysis of the major planning issues. The study's recommended land use distribution identified 202 of the 280 hectares as developable for residential purposes, and concluded the following in regard to the sanitary system:

- Two new SPSs and a separate sanitary forcemain will be required to convey flows to the WWTP;
- A forcemain alignment connecting to the Southpark Drive sewer is the preferred route; however, the sewer has insufficient capacity and requires replacement; and,
- A WWTP capacity increase to 68,000 m^3/day is required (this increase in capacity has since been achieved through rerating).

The City's 2023 OP states that lands within the Coldsprings Special Study Area are anticipated to accommodate growth to 2051, and a Secondary Plan will be completed for the area. The City's 2023 OP policies of the Rural Transitional Area Designation shall apply to the Coldsprings Special Study Area until the Secondary Plan is completed and the 2023 OP is amended.

3.6.5. Jackson Creek Special Policy Area

The Jackson Creek Special Policy Area is an overlay designation in the 2023 OP for lands within the downtown area that are susceptible to flooding under the regulatory flood (i.e., greater of the Timmins Storm and 100-year flood events). Permitted land uses within the special policy area shall be in accordance with OP designations for the Central Area. The area is subject to development policies, some of which include:

- Flood proofing building to the regulatory flood where practical,
- Storing chemicals which can pose an unacceptable threat to public safety during potential flooding above the regulatory flood; and,
- Requirement to flood proof and maintain land uses associated with emergency services (e.g., fire, police and ambulance stations and electrical substations) during a regulatory flood level.

3.7. Township of Cavan Monaghan Water and Wastewater Master Servicing Study

A draft Water and Wastewater Master Servicing Study Class EA report was completed in November 2023 for the Township of Cavan Monaghan. The study considered a 30-year planning horizon to the year 2051 and identified preferred alternatives for master servicing. The preferred wastewater treatment servicing alternative is to expand the existing Millbrook WWTP. The preferred wastewater collection and conveyance servicing alternative for the north catchment was to construct a new SPS and convey wastewater to the east sewer shed. The preferred collection and conveyance servicing alternative for the south catchment is upgrading the existing Tupper St. SPS to increase capacity.

3.8. Development Charges Background Studies

3.8.1. Planning Area-Specific Development Charges Background Study

The 2022 Planning Area-Specific Development Charges Background Study identifies the development-related capital costs that are attributable to 2051 forecasted development in order to build-out of eight planning areas. The planning/growth areas include Jackson, Carnegie East, Carnegie West, Chemong East, Chemong West, Liftlock, Coldsprings, and Lily Lake.

3.8.2. City-Wide Development Charges Background Study

In 2024, Hemson Consulting completed a Development Charges Background Study as part of a process to update the City's City-Wide Development Charges by-law. The updated by-law (24-081) was passed on December 2, 2024, and came into effect on January 1, 2025.

4. Planning and Policy Context

4.1. Federal Legislation and Policy Context

4.1.1. Constitution Act (1867 to 1982)

The Consolidation of the *Constitution Acts, 1867 to 1982* contains the *Constitution Act, 1867* (formerly the *British North America Act, 1867*), the *Canada Act 1982*, the *Constitution Act, 1982*, and the *Canadian Charter of Rights and Freedoms* and other provisions. Section 35 of the *Constitution Act, 1982* recognizes the rights of First Nations, Inuit, and Métis, provides protection for historic and modern treaties, and is the basis for the modern-day duty to consult with indigenous nations.

The Study Area contains lands that are subject to Rice Lake Treaty No. 20 (1818) and the Williams Treaties in 1923; collectively known as the Williams Treaties First Nation and includes the traditional territory of Alderville, Beausoleil, Curve Lake, Georgina Island, Hiawatha, Rama and Scugog Island First Nations. As per Section 35 of the *Constitution Act* (1982), Peoples with Treaty Rights must be consulted and accommodated prior to conducting any activities that could impact the rights or interests of Indigenous Peoples on the territory.

4.1.2. Department of Transport Act (1985)

The *Department of Transport Act* (1985) and *Historic Canals Regulations* (SOR/93-220), administered by the Parks Canada Agency, applies to "*the bed of the Trent-Severn Waterway and its lakes and rivers to the original upper controlled water elevation*". Any in-water, shoreline works, or related activities are subject to the *Rideau Canal and Trent-Severn Waterway National Historic Sites of Canada Policies for In-Water and Shoreline Works and Related Activities* (Parks Canada, 2007).

4.1.3. Species at Risk Act

The *Species at Risk Act* (SARA) focuses on restoring and maintaining populations of species that are at risk of extinction or extirpation due to human activity such as habitat destruction, hunting, introduction of competing species, or other anthropogenic causes.

The SARA incorporates several prohibitions to protect individuals of listed threatened (THR), endangered (END), or extirpated species at risk (SAR), as designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) by using biological information on a species deemed to be in danger. The COSEWIC reviews research information on population and habitat status, trends and threats and applies assessment criteria based on international standards. Once a species is added to *Schedule 1 – List of Wildlife Species at Risk*, it benefits from legal protection afforded and the mandatory recovery planning required under the Act. Per Section 34, Section 58, and Section 61, these prohibitions apply to aquatic species and migratory birds protected by the *Migratory Birds Convention Act* (MBCA) on all lands, and any other listed wildlife species when on federal lands.

4.1.4. Migratory Birds Convention Act

The MBCA was established in 1917, and last amended in 2024, to protect migratory birds, their eggs, their nests and prohibit the deposit of harmful substances in waters and areas frequented by them. The MBCA lists protected families and subfamilies of migratory birds and lays out legislation surrounding activities that may impact migratory birds or nests, including when and where activities may occur. Any tree removals required for construction of the preferred solution will be completed outside of the breeding bird season (April 1 to August 30) to avoid disturbing active nests of migratory birds protected under the MBCA.

4.1.5. Fisheries Act

The Fisheries Act provides provisions on the conservation and protection of freshwater and marine fish habitat in order to sustain fish species. In 2013, the Fisheries Policy statement was released to support the changes made to the Fisheries Act in 2012. The changes made to the Fisheries Act focuses on the protection of the productivity of commercial, recreational, and Aboriginal fisheries, improved implements for both compliance and protection, enhanced stakeholder partnerships (e.g., government agencies, local groups), and ensuring regulatory requirements are clear and consistent. In 2018, amendments for restoration of lost protections and incorporation of modern safeguards were proposed. The Fisheries Act received royal assent and became law as of June 21, 2019.

Developed under the Fisheries Act is the Wastewater Systems Effluent Regulations which aims to deliver on a federal commitment in the 2009 Canadian Council of Ministers for the Environment (CCME) Canada-wide Strategy for the Management of Municipal Wastewater Effluent to establish national baseline effluent quality limits. It requires that all facilities achieve minimum National Performance Standards and develop and manage site-specific Effluent Discharge Objectives. The strategy requires that overflow frequencies for sanitary sewers are not increased due to development or redevelopment. Overflows should not occur during dry weather, except during spring thaw and emergencies. Source control of pollutants is recommended, and monitoring and reporting on effluent quality is required. The 2014 Progress Report outlined the progress made by signatory federal, provincial, and territorial jurisdictions on the commitments made in the 2009 Strategy.

4.1.6. Bay of Quinte Remedial Action Plan

The Otonabee River, which passes through the City, is a tributary to the Trent River which discharges into the Bay of Quinte. The Bay of Quinte was designated an Area of Concern in 1985 by the International Joint Commission (a Canadian-American organization established to cooperatively manage and protect waters affecting both countries) under the *Great Lakes Water Quality Agreement* (1972). Areas of Concern are communities, bays and rivers on the Great Lakes system where human activities have severely damaged the quality of the environment. Environmental concerns in the Bay of Quinte are due to excess nutrients, persistent toxic contamination, bacterial contamination and the loss or destruction of fish and wildlife habitat.

The *Bay of Quinte Remedial Action Plan* (BQRAP) was initiated in 1985 and aims to remove the Area of Concern designation through ecological restoration works. It is managed and implemented jointly by Environment and Climate Change Canada and the Ministry of the Environment, Conservation and Parks

(MECP). As part of this plan, a phosphorus management strategy was developed to set long term phosphorus concentration and loading targets. The recommended phosphorus management actions described in the *"Draft Discussion Paper – A Long-Term Phosphorus Management Strategy of the Bay of Quinte"* involve reducing point source phosphorus loadings by sewage treatment plants by 60% based on current ECA limits. This equates to maintaining a phosphorus effluent limit of 0.1 mg Total Phosphorus (TP) per litre as an objective for all WWTPs that discharge into the Bay of Quinte watershed, including the Peterborough WWTP.

4.2. First Nations Legislation and Policy Context

The First Nations Water Declaration is an established Indigenous law and policy, asserting Indigenous rights, responsibilities, and sovereignty over their water resources. It emphasizes the sacred relationship between First Nations and water, recognizing water as a living entity essential to all life. The declaration serves as a call to action for governments and the public to respect Indigenous water rights and ensure clean, accessible water for all.

In contrast, the Canada Water Act (1970) is federal legislation that governs the conservation, management, and protection of Canada's water resources. However, it does not explicitly recognize Indigenous water rights or include provisions for water governance and water stewardship traditions. The federal government has been working with Indigenous groups to address this issue, particularly through programs like the First Nations Water and Wastewater Action Plan (FNWWAP). The FNWWAP aims to improve access to safe drinking water and wastewater systems in First Nations communities across Canada by providing funding for water infrastructure, operations, and training. The Safe Drinking Water for First Nations Class Action Settlement (2021) allocated $8 billion to address water issues, including infrastructure and compensation.

4.3. Provincial Legislation and Policy Context

4.3.1. Planning Act

The *Planning Act*, *1990* (amended 2024) establishes a land use planning system led by provincial policy and allows for the integration of matters of provincial interest into provincial and municipal planning decisions. The *Planning Act* also defines the roles and responsibilities of the province and municipalities, as listed below:

Provincial Responsibility

- Issuance of the Provincial Planning Statements;
- Promotion of provincial interests;
- Preparation of provincial plans, such as the Greenbelt Plan
- Provision of advice to municipalities and the public on land use planning issues; and,
- Administration of local planning controls and approvals where required.

Municipal Responsibility

- Make local planning decisions for future communities;
- Preparation of planning documents such as Official Plans and Zoning By-Laws; and,
- Ensure that planning decisions and documents are consistent with the *Provincial Planning Statement* and conform or do not conflict with provincial plans.

4.3.2. Provincial Planning Statement

The Province of Ontario (Province)released the *Provincial Planning Statement* (PPS) which came into effect on October 20, 2024. This document replaces the previous *Provincial Policy Statement* (2020) and *A Place to Grow: Growth Plan for the Greater Golden Horseshoe* (2020). The PPS provides an overview of the land use goals and objectives for the Province to the year 2031 and provides policy direction for land use planning matters related to provincial interests. It includes key chapters outline how the Province will achieve their goals for the creation of strong and competitive communities, development of appropriate infrastructure and facilities, wise use and management of resources, and the protection of public health and safety. The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together.

Key general infrastructure policies included in the PPS relevant to water and wastewater services include the following:

- Infrastructure and public service facilities shall be provided in an efficient manner while accommodating projected needs;
- Planning for infrastructure and public service facilities shall be coordinated and integrated with land use planning and growth management so that they:
    - are financially viable over their life cycle, which may be demonstrated through asset management planning;
    - leverage the capacity of development proponents, where appropriate; and,
    - are available to meet current and projected needs.
- Before consideration is given to developing new infrastructure and public service facilities:
    - the use of existing infrastructure and public service facilities should be optimized; and,
    - opportunities for adaptive re-use should be considered, wherever feasible.
- Infrastructure and public service facilities should be strategically located to support the effective and efficient delivery of emergency management services, and to ensure the protection of public health and safety in accordance with the policies in Chapter 5: Protecting Public Health and Safety; and,
- Public service facilities should be co-located to promote cost-effectiveness and facilitate service integration, access to transit and active transportation.

More specifically, the PPS recommended that water and wastewater services should:

- Accommodate forecasted growth in a timely manner that promotes the efficient use and optimization of existing municipal sewage services and municipal water services and existing private communal sewage services and private communal water services;
- Ensure that these services are provided in a manner that:
  - can be sustained by the water resources upon which such services rely;
  - is feasible and financially viable over their life cycle;
  - protects human health and safety, and the natural environment, including the quality and quantity of water; and,
  - aligns with comprehensive municipal planning for these services, where applicable.
- Promote water and energy conservation and efficiency;
  - integrate servicing and land use considerations at all stages of the planning process;
  - consider opportunities to allocate, and re-allocate if necessary, the unused system capacity of municipal water services and municipal sewage services to support efficient use of these services to meet current and projected needs for increased housing supply; and,
  - be in accordance with the servicing options outlined through policies 3.6.2, 3.6.3, 3.6.4 and 3.6.5.

The PPS marks a shift towards local autonomy in planning while incentivizing infrastructure projects that enable rapid housing and economic growth. Where applicable, the PPS provides opportunities for infrastructure projects supporting transit, utilities, and settlement expansion that align with the growth goals.

4.3.3. Environmental Protection Act

The *Environmental Protection Act* (EPA), 1990 (amended 2024) was enacted by the Province to provide for the protection and conservation of the natural environment. Under Section 6(1) of the Act, "*No person shall discharge into the natural environment any contaminant, and no person responsible for a source of contaminant shall permit the discharge into the natural environment of any contaminant from the source of contaminant, in an amount, concentration or level in excess of that prescribed by the regulations*".

In conjunction with the *Ontario Water Resources Act* (OWRA), 1990 (amended 2021), the EPA provides exemptions for projects that complete an ECA. A CLI ECA is one of the many types of ECAs, and is generally completed for municipal sewage collection systems, but does not apply to municipal sewage treatment plants or privately owned systems.

4.3.4. Ontario Water Resources Act

The OWRA provides for the conservation, protection and management of Ontario's waters and for their efficient and sustainable use, in order to promote Ontario's long-term environmental, social and economic well-being. It provides policy direction and regulations for the efficient use of water,

management of wells, water quality, water taking, sewage works, and others. It works in conjunction with the EPA, to manage and regulate sewage works in the Province (Section 53 through 62).

There are a number of guidelines and procedures relating to municipal sewage works that have been issued under the act, including the MECP Procedure *F-5-1 Determination of Treatment Requirements for Municipal and Private Sewage Treatment Works*, 2016 (updated in 20221).

4.3.4.1. MECP Procedure F-5-1

Procedure F-5-1 outlines the treatment requirements for municipal and private sewage treatment works discharging to surface waters. Effluent requirements are established on a case-by-case basis considering the characteristics of the receiving water body. Guideline F-5 takes the approach that all sewage treatment works should provide secondary treatment or equivalent as the "normal" level of treatment unless individual receiving water assessment studies indicate the need for higher levels of treatment. Existing works not complying with this Guideline are required to upgrade as soon as possible.

This procedure gives Effluent Design Objectives for biochemical oxygen demand (BOD), suspended solids, total phosphorus, and Effluent Guidelines for the former two. An Effluent Design Objective for ammonia is given for conventional activated sludge treatment with nitrification. Sewage treatment works designed according to the MECP "*Guidelines for the Design of Sewage Treatment Works*" should be able to produce annual average effluent quality approximately equal to the Effluent Design Objectives, but not to exceed the Effluent Guidelines criteria.

4.3.5. Sustainable Water and Wastewater Systems Improvement and Maintenance Act

The *Sustainable Water and Sewage Systems Act* (2002) legislates financial planning and sustainability of municipal water and wastewater systems and specifies reporting requirements. In 2010, Bill 13 *Sustainable Water and Wastewater Systems Improvement and Maintenance Act* repealed the 2002 act.

Key purposes of Bill 13 are as follows:

- Sets out the purposes of the Act, which include ensuring that public ownership of water services and wastewater services is maintained;
- Establishes the Ontario Water Board as an agent of the Crown and sets out the Board's objectives, powers and duties which relate to the regulation of water services and wastewater services;
- Sets out the responsibilities of municipalities or groups of municipalities that are designated as regulated entities by regulation; and,
- Regulated entities must prepare business plans for the provision of water services or wastewater services. The plan must contain, among other things, an assessment of the full cost of providing water services or wastewater services to the public and a description of how the regulated entity intends to pay this full cost.

4.3.6. *Conservation Authorities Act*

The legislative mandate of the Conservation Authority, as set out in Section 20 of the *Conservation Authorities Act*, 1990 (amended 2024) is to establish and undertake programs designed to further the conservation, restoration, development, and management of natural resources. Conservation Authorities are local agencies that protect and manage water and other natural resources at the watershed level. These agencies have a number of responsibilities and functions in the land use planning and development process.

The Study Area is located within the Otonabee Region Conservation Authority (ORCA) jurisdiction. The Otonabee Region Watershed covers an area of approximately 2000 km^2 and includes the sub-watersheds of the Otonabee, Indian, and Ouse Rivers. Through Section 28 of the *Conservation Authorities Act,* ORCA is responsible for administering Ontario Regulation 41/24: *Prohibited Activities, Exemptions and Permits* (O. Reg. 41/24).

4.4. Municipal Legislation

While the Study Area is mostly located within the single tier municipality of the City of Peterborough and subject to the *City of Peterborough Official Plan* (2023), portions of the Study Area, including the Peterborough Landfill site and the Peterborough Airport site, are located outside of the City. These additional Official Plans, as outlined in **Table 4-1** below have been reviewed for provisions related to public infrastructure planning and natural heritage priorities.

Table 4-1: Municipalities located within the Study Area

Study Area	Sub-Study Area	Single Tier Municipality	Upper Tier Municipality	Lower Tier Municipality
Study Area	City of Peterborough	City of Peterborough		
	Peterborough Landfill Site (all)		County of Peterborough	Township of Otonabee-South Monaghan
	Peterborough Airport Site (western lands)		County of Peterborough	Township of Cavan Monaghan, and the
	Peterborough Airport Site (eastern lands)			Township of Otonabee-South Monaghan

4.4.1. *City of Peterborough Official Plan*

The 2023 OP is designed to be a guiding document to provide direction on the management of communities, land-use changes and physical development. The Province approved the OP with modifications on April 11, 2023. On November 16, 2023, the Province introduced Bill 150, the Planning Statute Law Amendment Act, 2023 that reversed the OP decisions made in April 2023.

Section 1.1 outlines the City's population and employment growth projections and its growth approach. The 2023 OP identifies Strategic Growth Areas, which will be the focus of higher density forms of intensification and will have secondary plans developed. The 2023 OP identifies major development and redevelopment opportunities that may include infill, brownfield sites, the expansion or conversion of existing buildings, greyfields, or the development of new mixed-use, higher density corridors and centres

serving emerging greenfield communities. The OP's Designated Greenfield Areas are expected to accommodate a maximum of 50 percent of the City's residential growth to 2051.

Within the 2023 OP, Natural Heritage Systems (NHS) are defined as "*a system made up of natural heritage features and areas, and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems.*" As per Section 6.1.2.f and Section 4.6.2.l of the 2023 OP municipal infrastructure projects should avoid areas designated as Natural Areas, however they may be permitted where they have been identified within the 2023 OP and/or an approved EA and they are subject to the completion of a satisfactory Environmental Impact Study.

4.4.2. County of Peterborough Official Plan

The County of Peterborough has recently undergone Official Plan updates, including the preparation of the *County Official Plan,* which was adopted by Council in 2022, but is still awaiting approval from the Minister of MMAH. Until such time, the 1994 *County of Peterborough Official Plan* remains in force.

Natural Heritage goals and policies are identified within Section 4.1 of the County OP and aim to "*protect and enhance natural features and ecological systems, conserve natural resources, reduce pollution, and protect people and property from environmental hazards*". It also sets the land use and planning framework for local Official Plans and decision-making, and its policies are broad and meant to guide local Townships in creating detailed policies in their own Official Plans. The County OP indicates local municipalities shall establish water and sewer service schedules in local Official Plans and monitor collection and treatment capacities.

The County OP was reviewed for provisions related to public infrastructure planning and natural heritage priorities. It designates the Peterborough Landfill site as a Waste Management Area, with a NHS Overlay that includes a locally significant wetland (outlined in Map OSM-3 'Land Use Schedule' and 'Schedule – Land Use Plan – County's Proposed Refined NHS'). The County OP's permitted uses of the Waste Management Area land is for predominantly solid waste disposal. Construction of buildings, structures and hard surface paving is permitted if sufficient background investigations are completed. The County OP requires an environmental impact assessment to be completed for proposed development in or adjacent to natural heritage features including all lands within 120 m of significant wetlands.

4.4.3. Township of Otonabee-South Monaghan Official Plan

The *Township of Otonabee-South Monaghan Official Plan* was prepared in 2003 and covers a 20-year planning period to the year 2023. It outlines objectives for the environment, use and management of natural resources, preservation of agricultural and rural communities, economic development, provision of culture, recreation and community social needs, tourism, transportation, public utilities and infrastructure, and community improvement.

Once approved by the Minister of MMAH, the 2022 *County Official Plan* will replace the *Township of Otonabee-South Monaghan Official Plan*.

4.4.4. Township of Cavan Monaghan Official Plan

The *Township of Cavan Monaghan Official Plan* (2015) was approved by the County of Peterborough in 2013 and the Ontario Municipal Board in 2015, and has been amended recently, in 2021. Although the Township of Cavan Monaghan falls within Peterborough County, the Township opted to maintain their own separate OP. The goals of the plan are to build a sense of community in the Township, preserve the rural character, protect and preserve the natural environment, improve the economy, ensure development is attractive, accessible, and reflects the historic character of the Township, and manage change in a manner that has the greatest positive impact on the Township.

The Township OP lists the Peterborough Airport to contain Natural Core Area designations and a NHS overlay that includes provincially and locally significant wetlands. The Township OP's Natural Core Area designation is intended to recognize wetlands and streams, together with lands that form a vegetation protection zone around these key hydrologic features. Permitted uses within the Natural Core Area include infrastructure uses, amongst others.

The Township OP defines planning priorities related to water and sanitary servicing as follows:

> "*Planning for sewage and water services shall promote efficient use and optimization of existing water and sewage infrastructure. These systems should be provided in a manner that can be sustained by the water resources upon which such services rely, prepares for the impacts of changing climate, is feasible and financially viable over their lifecycle and protects human health and safety and the natural environment.*"

Section 6.2.e of the Township OP outlines that all infrastructure subject to and approved under the EAA, the *Planning Act*, or others, are permitted within the NHS where it serves the significant growth and economic development expected in Southern Ontario.

4.5. SMP Growth Projections

Per the City's 2023 OP, "*growth to 2051 will occur through a combination of intensification within the Delineated Built-Up Area and development within the Designated Greenfield Area*". The 2023 OP targets a minimum of 50% of new housing units approved by the City each year to be identified as intensification, with a focus on areas that have existing capacity or can be readily improved, particularly within Strategic Growth Areas. Designated Greenfield Areas, which lie outside the Delineated Built Boundary, but within the City limits, are expected to accommodate a maximum of 50% of the City's residential growth to 2051.

The SMP uses growth projections based on development applications and growth projection data allocated to Traffic Assessment Zone (TAZ) spatial areas. Future flow projections are thereby based on total expected population growth and a flow rate per capita using current City design standards. The growth areas shown in **Figure 4-1** indicate property parcels that have some planned growth somewhere within that parcel. Growth may not be evenly distributed across the site, and any development would need to comply with restrictions associated with applicable land use designations within the property (i.e. no development within provincially significant wetlands).

Table 4-2: Revised Residential and Employment Growth (2016-2051)

Year	Residential	Employment
2016	81,951	39,088
2031	108,139	44,340
2041	123,594	49,671
2051	138,341	53,962

Through a separate growth projection exercise, the City anticipates increased growth beyond the 2023 OP projections, with a revised 2051 population of 138,341 and revised 2051 employment of 53,962. The residential and employment growth over time is shown in **Table 4-2.** Specifically, four areas contribute to this added growth, as indicated by the numbered sites in **Figure 4-1,** and listed below:

1. Trent University (Greenfield),
2. Fleming College (Greenfield),
3. General Electric Site (Intensification), and,
4. Coldsprings Secondary Plan Area (Greenfield).

The SMP will consider impacts of this larger growth projection on servicing needs.

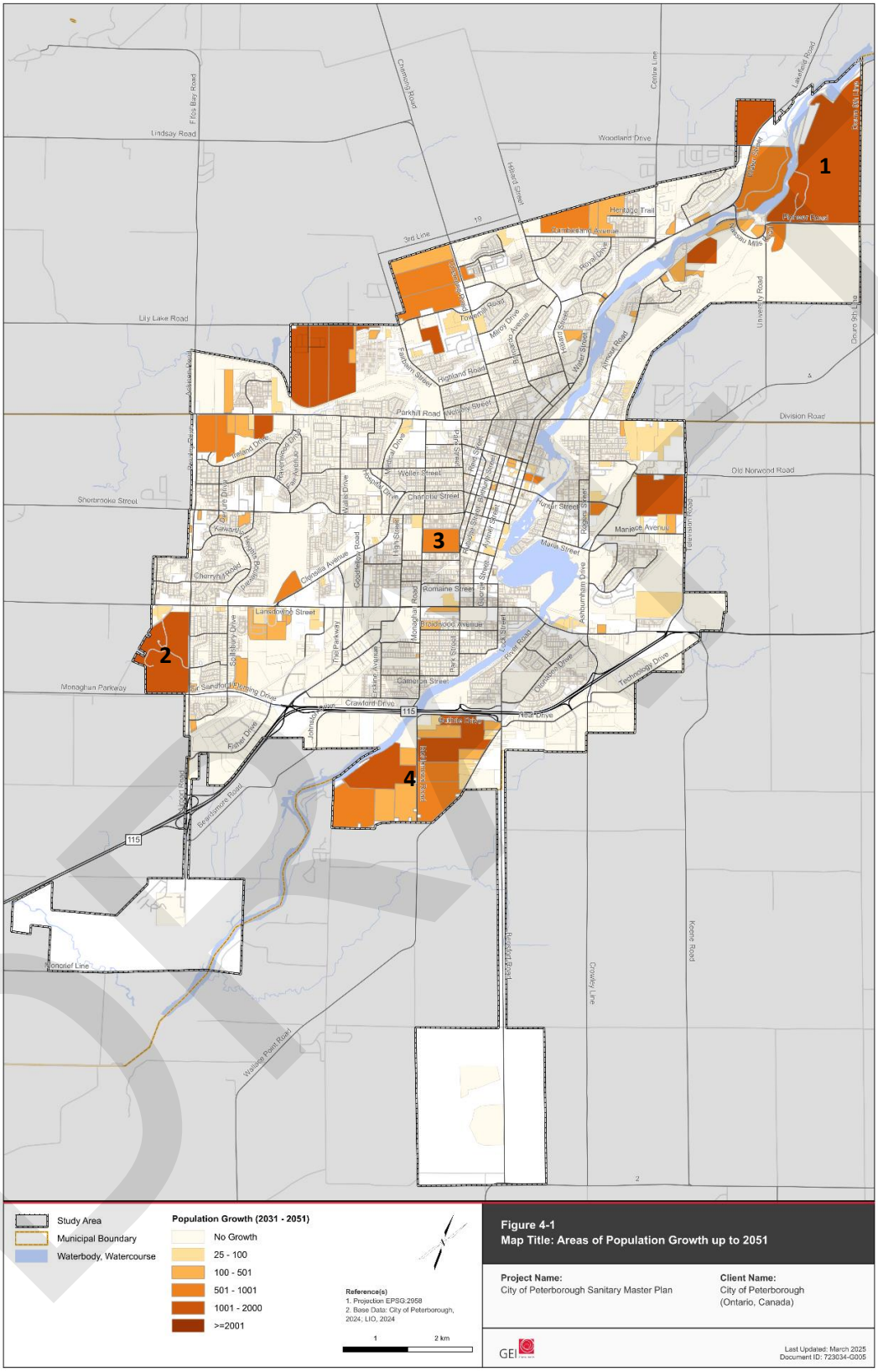
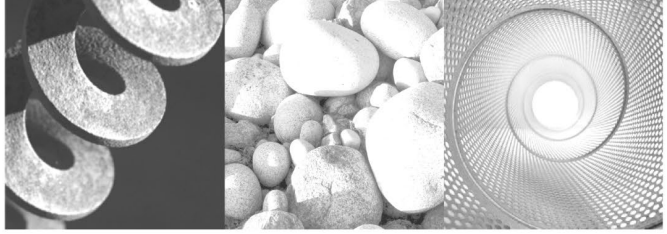


Figure 4-1: Areas of Population Growth up to 2051

5. Summary

Overall, the legislation and planning policies, background studies and existing study area conditions described in this document provide a framework for developing sanitary servicing strategies under this Master Plan, in alignment with the Official Plan growth projections.

The subsequent Volume 3 will review existing system constraints, future system needs to service growth, and development and evaluation of sanitary servicing strategies. Volume 3 will also describe the proposed capital program and implementation plan to proceed with the recommended projects.



GEI Consultants

peterborough

City of Peterborough Sanitary Master Plan

VOLUME 2*:* APPENDIX A

Technical Memorandum (TM) 1 - Background Review

Prepared by:
GEI Consultants Canada

April 2025

The City of Peterborough is committed to ensuring that all City services, programs, and facilities are inclusive and accessible. Please contact the Project Team if you need any accommodations to provide comments and/or feedback for this Study.

Version Updates

The following is a record of the changes/updates that have occurred on this document:

Version	Changes / Updates	Author	Reviewer	Date	Reviewer Signature
1	Draft Document	Ana Brankovan	Laura Verhaeghe	Dec 18, 2023	
2	Final Document	Bailey Cole Ashley An	Laura Verhaeghe	April 2025	

Table of Contents

List of Tables

List of Figures

Appendices

Acronyms and Abbreviations

CHSR	Cultural Heritage Screening Report
CLI	Consolidated Linear Infrastructure
EA	Environmental Assessment
ECA	Environmental Compliance Approval
ESA	Endangered Species Act
I&I	Inflow and Infiltration
MCEA	Municipal Class Environmental Assessment
MEA	Municipal Engineers Association
MECP	Ministry of the Environment, Conservation and Parks
MMAH	Ministry of Municipal Affairs and Housing
MLD	Million liters per day
MNRF	Ministry of Natural Resources and Forestry
NHS	Natural Heritage System
OP	Official Plan
ORCA	Otonabee Region Conservation Authority
PPS	Provincial Policy Statement
SAR	Species at Risk
SMP	Sanitary Master Plan
SPS	Sewage Pumping Station
TDH	Total Dynamic Head
TM	Technical Memorandum
TMP	Transportation Master Plan
WWTP	Wastewater Treatment Plant

TECHNICAL MEMORANDUM 1: BACKGROUND REVIEW AND DATA GAP ANALYSIS

CITY OF PETERBOROUGH SANITARY MASTER PLAN

APRIL 2025

1 Introduction

1.1 Study Objectives

The City of Peterborough (the City) has initiated a Sanitary Master Plan to guide future improvements to all elements of the sanitary system including collection, conveyance, and treatment to meet existing and future capacity needs in alignment with the *City of Peterborough Official Plan, 2023* (OP).

The City of Peterborough's OP anticipates that the City will grow from a population of 83,000 people in 2016 to a projected population of 125,000 people by 2051. It is also anticipated that the employment sector will grow from 45,000 jobs in 2016 to 63,000 by 2051. The City will need to achieve both financially and environmentally sustainable growth. This Sanitary Master Plan (SMP) will provide a framework to manage sanitary infrastructure needs to accommodate urban growth and intensification that maximizes use of existing servicing capacity.

The Sanitary Master Plan will achieve the following objectives:

- Assess the capacity of the existing sanitary system, including collection, conveyance, and treatment, and identify the requirements to service existing and future development areas;
- Provide recommendations for short and long term capital planning to forecast funding requirements and form the basis of a Development Charges Background Study;
- Create a framework for development within the identified Strategic Growth Areas;
- Provide recommendations within an Implementation Plan on how to proceed with the SMP, including a Capital Plan to 2051, monitoring and enforcement programs, and recommendations related to policy, guidance, and operation of the City's Consolidated Linear Infrastructure (CLI) Environmental Compliance Approval (ECA);
- Identify existing system redundancies, vulnerabilities and risk, and develop a mitigation approach; and
- Engage the public, agencies and First Nations communities throughout the Master Plan process.

GEI must consider innovative approaches that address the City's need to reduce greenhouse gas emissions, adapt its infrastructure and operations under a changing climate and plan for infrastructure expansion that is cost-efficient and financially sustainable for the community.

This study will be undertaken in accordance with the Modified Approach #2 of the Master Planning process as set out in the Municipal Class Environmental Assessment (EA) of the Class EA process and will include two Public Information Centres.

Technical Memorandum (TM) 1 provides a review of previous related studies, study area characteristics and existing sanitary infrastructure in the City of Peterborough, as well as a data gap analysis. This background information will inform the detailed analysis of the City's existing sanitary infrastructure and current constraints that will be documented in TM 2.

1.2 Technical Memorandum Outline

This technical memorandum is organized into the following sections:

1. **Introduction:** This section describes the purpose of the Sanitary Master Plan and TM outline.
2. **Study Area:** This section reviews the social, cultural, and natural environment of the study area.
3. **Planning Context:** This section describes the key policies that provide a framework for development within the study area.
4. **Existing Sanitary System:** This section provides an overview of the existing sanitary system, including sewers, wastewater pumping stations and wastewater treatment plant.
5. **Background Review and Previous Studies:** This section provides a review of recommendations from previous related studies in the City of Peterborough and surrounding areas.
6. **Gap Analysis and Next Steps:** The final section documents additional required information or analysis and summarizes the major findings and the next steps in the assessment process.

2 Study Area

2.1 Overview of Study Area

The Study Area encompasses the entirety of the City of Peterborough, as well as Peterborough Airport lands, and Peterborough Waste Management Facility. **Figure 2-1** shows the Study Area boundaries as well as the existing municipal sanitary infrastructure including sewers, sewage pumping stations and the Peterborough Wastewater Treatment Plant (WWTP). The City's municipal boundary encompasses approximately 6,000 hectares of land. The Airport and Waste Management Facility lands are located south of the City limits within the County of Peterborough, and the Townships of Cavan Monaghan and Otonabee-South Monaghan. Sanitary sewage produced within these lands are received by the City's sanitary system and treated at the Peterborough WWTP.

Further details on the City's existing sanitary system are provided in **Section 4** of this TM.

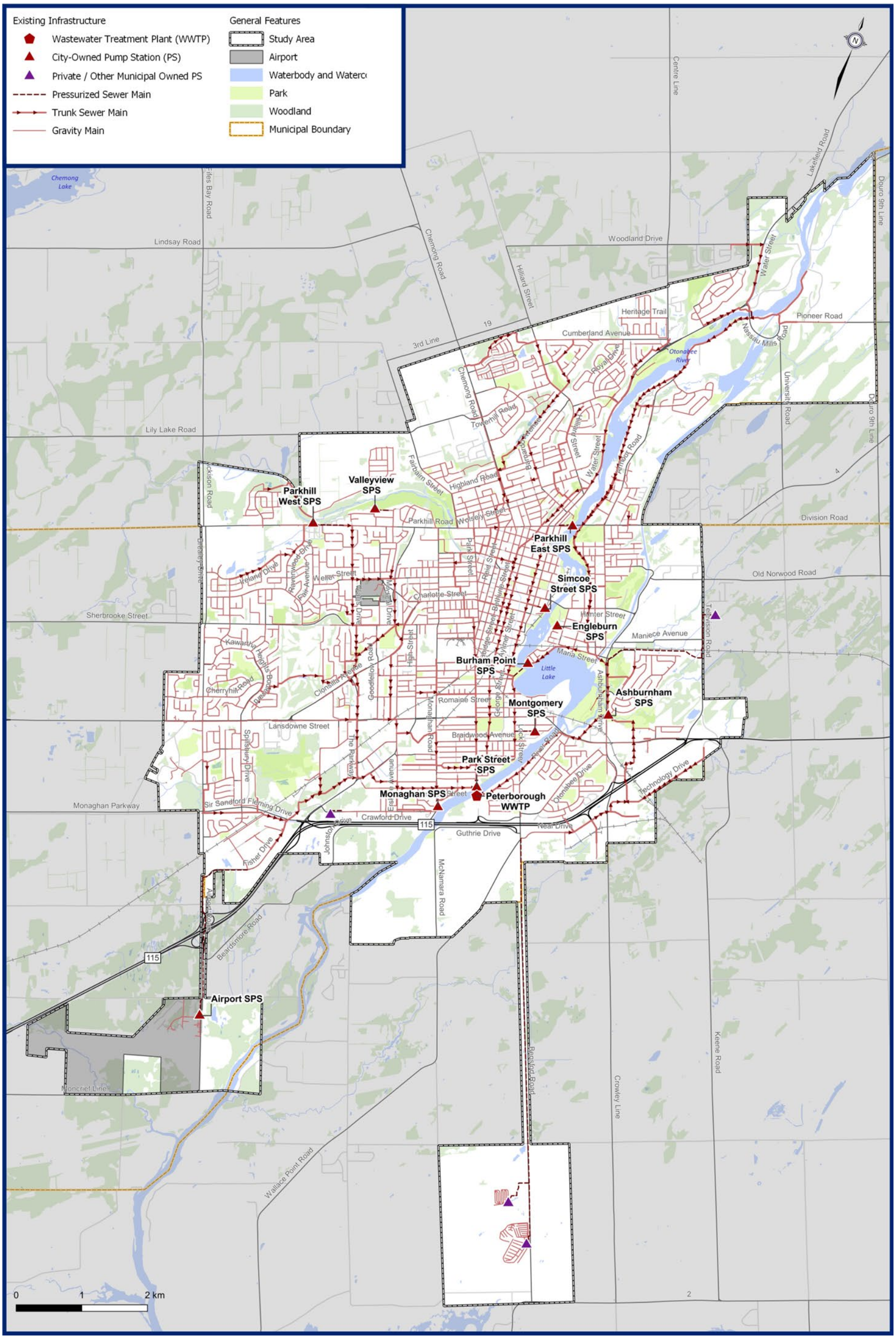


Figure 2-1 Study Area Map and Existing Municipal Sanitary System

2.2 Urban Structure and Land Use Designations

The Land Use Plan for the City, as described in the 2023 OP, includes Residential, Major Institutional, Major and Minor Mixed-Use Corridor, Major Open Space, Natural Areas, General and Prestige Employment, and Rural Transitional Area designations as well as a Central Area and Coldsprings Special Study Area (details in **Section 5.8.4**). Land use designations are illustrated in **Figure 2-3**.

The Central Area, the historic centre of the City, contains the Urban Growth Centre boundary, seven distinct land use designations and Jackson Creek Special Policy Area as shown in **Figure 2-4** (details in **Section 5.4.2**). The OP also delineated Strategic Growth Areas within the City, including the Urban Growth Centre in the downtown core, and Mixed-Use Corridors along primary transit corridors as shown in **Figure 2-2**.

Furthermore, the City's OP identifies Intake Protection Zones around the Otonabee River on the north portion of the municipal boundary in accordance with the approved Trent Source Protection Plan and Assessment Report. Large areas within the City are designated as Significant Groundwater Recharge Areas and contain Highly Vulnerable Aquifers. A small area on the southwest City boundary is designated as a Wellhead Protection Area E.

The Peterborough Waste Management Facility is located within the County of Peterborough and the Township of Otonabee-South Monaghan. The *County of Peterborough Official Plan* (adopted by Council in 2022 but not yet been approved by the Minister of Municipal Affairs and Housing) designates the Peterborough Waste Management Facility as a Waste Management Area, surrounded by agricultural, rural and natural core areas. A portion of the Waste Management Facility lands contain floodplain and aggregate resource overlay. This site is not currently designated under the *County of Peterborough Official Plan* (1994, Amended 2022) nor the *Township of Otonabee-South Monaghan Official Plan (2003).*

The Peterborough Airport is located within the Township of Cavan Monaghan and the Township of Otonabee-South Monaghan, in Peterborough County. Under the *County of Peterborough Official Plan* (adopted by Council in 2022, but has not yet been approved by the Minister of Municipal Affairs and Housing), the Airport has a special airport land use designation and contains natural features including floodplain, significant woodland and non-provincially significant wetland. The site has similar designations under the *Township of Cavan Monaghan Official Plan* (2015).

2.3 Key Employment, Residential, Commercial Lands

The City's employment is largely service based. Major institutional employment areas include Trent University, Sir Sandford Fleming College, Ministry of Natural Resources and Peterborough Regional Health Centre. The City of Peterborough OP identifies a business district designation in the downtown Central Plan Area, which contains diverse clusters of commercial establishments. A prestige employment designation at three locations on the City boundary applies to clusters of economic activities such as manufacturing, warehousing, and associated retail along Highway 115 and the rail corridor.

Peterborough is also home to several wet industries, which contribute to the sanitary system, namely Quaker Oats (PepsiCo) in the downtown core and Minute Maid on Lansdowne St West.

2.4 Special Features

The Study Area contains special features, which are outlined below:

- **Downtown area** contains shopping, food, entertainment, and other experience opportunities that play an essential role in the cultural life of the City. The downtown area is subject to a number of initiatives focused on the renewal of the City's urban core and community building.
- **Otonabee River** runs through the City from Katchewanooka Lake to Rice Lake and forms part of the Trent-Severn Waterway.
- **Little Lake** is a small lake on the Otonabee River, which is used for fishing, swimming, boating, and a range of significant events. Peterborough's historic downtown opens to Little Lake, providing a scenic waterfront and a marina.
- **Jackson Creek** flows through the developed downtown area and outlets into the Otonabee River at Little Lake. The creek has been significantly altered through the City's urban area. In July 2004, the creek overflowed and caused extensive damage.
- **Trent-Severn Waterway National Historic Site**: the 386 km long waterway first opened in 1922 to connects Lake Ontario to Georgian Bay. Parks Canada maintains and operates the historic lock system as a destination for recreational boaters, paddlers, and local community.
- **Peterborough Lift Lock** was designated a national historic site of Canada because it is the highest hydraulic lift lock in the world. The feature was constructed in 1904 on the Trent-Severn Waterway and holds heritage value for its surviving physical attributes and engineering recognition.
- **Trent University** is situated on the banks of the Otonabee River in the northeastern quadrant of the City, with a student population at the Peterborough campus of approximately 10,500 in 2023. Sanitary flows from the University are higher from September to April, when more students are living on-campus.
- **Sir Sandford Fleming College**'s Sutherland Campus is located on the southwest end of the City. The college also has campuses in Lindsay, Cobourg, and Haliburton and has more than 6,800 full-time and 10,000 part-time students.
- **Airport Lands** are located directly south of the City boundary within the Township of Cavan-Monaghan. The airport provides transportation services for emergencies, recreational pilots, charter flight businesses, aviation education, etc.
- **Peterborough Waste Management Facility** is a landfill located in the southeastern portion of the study area at 1260 Bensfort Rd in Otonabee-South Monaghan, approximately 6 km south of the City limits and within Peterborough County. This facility is jointly owned by the City of Peterborough and Peterborough County and is operated under a contract to the County and City by R.W. Tomlinson Ltd. Leachate from this landfill is discharged via forcemain to the sanitary sewer and eventually treated at the Peterborough Wastewater Treatment Plant (WWTP).

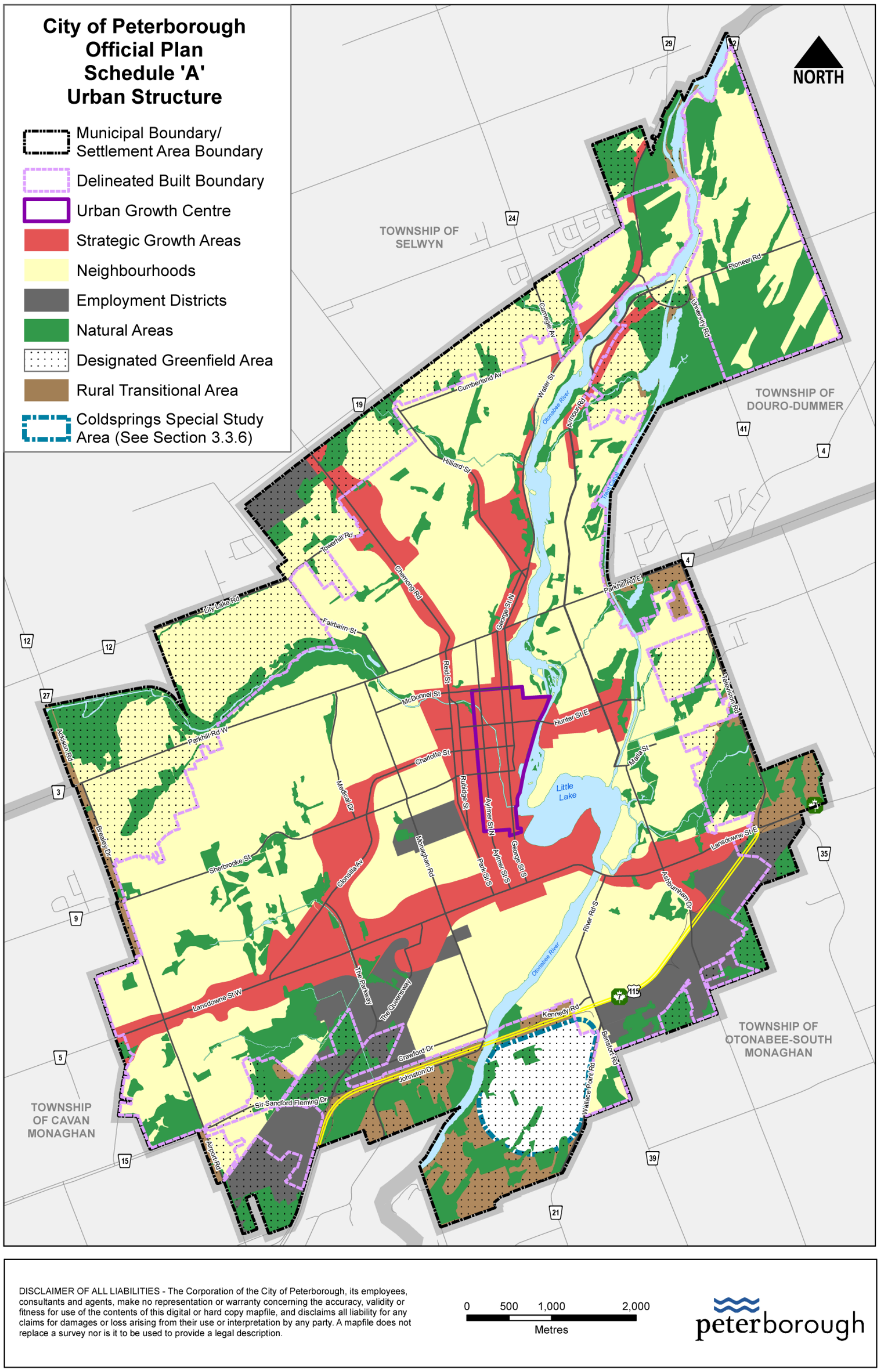


Figure 2-2 Peterborough 2023 Official Plan Schedule 'A' Urban Structure

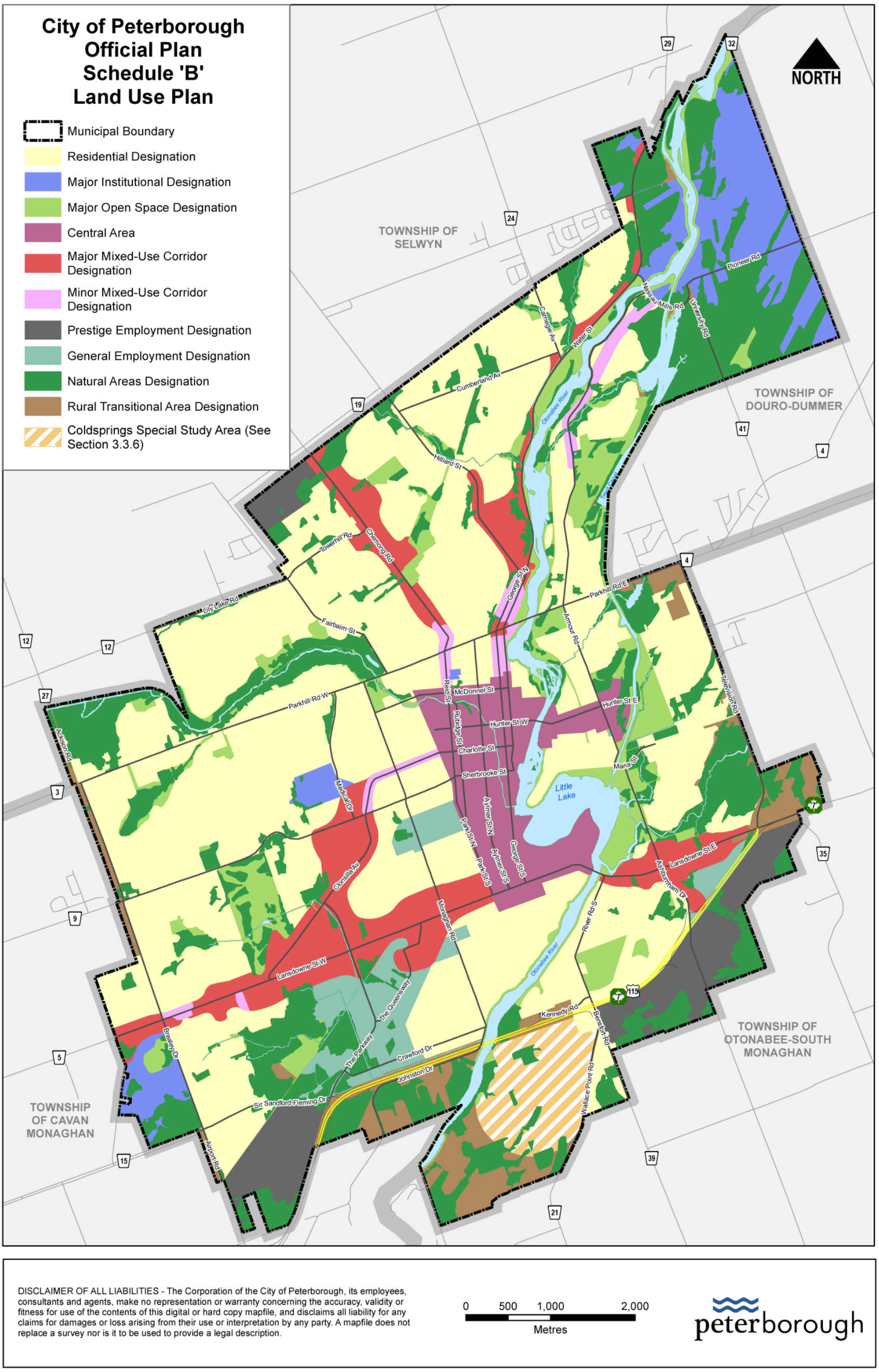


Figure 2-3 City of Peterborough 2023 Official Plan Schedule 'B' Land Use Plan

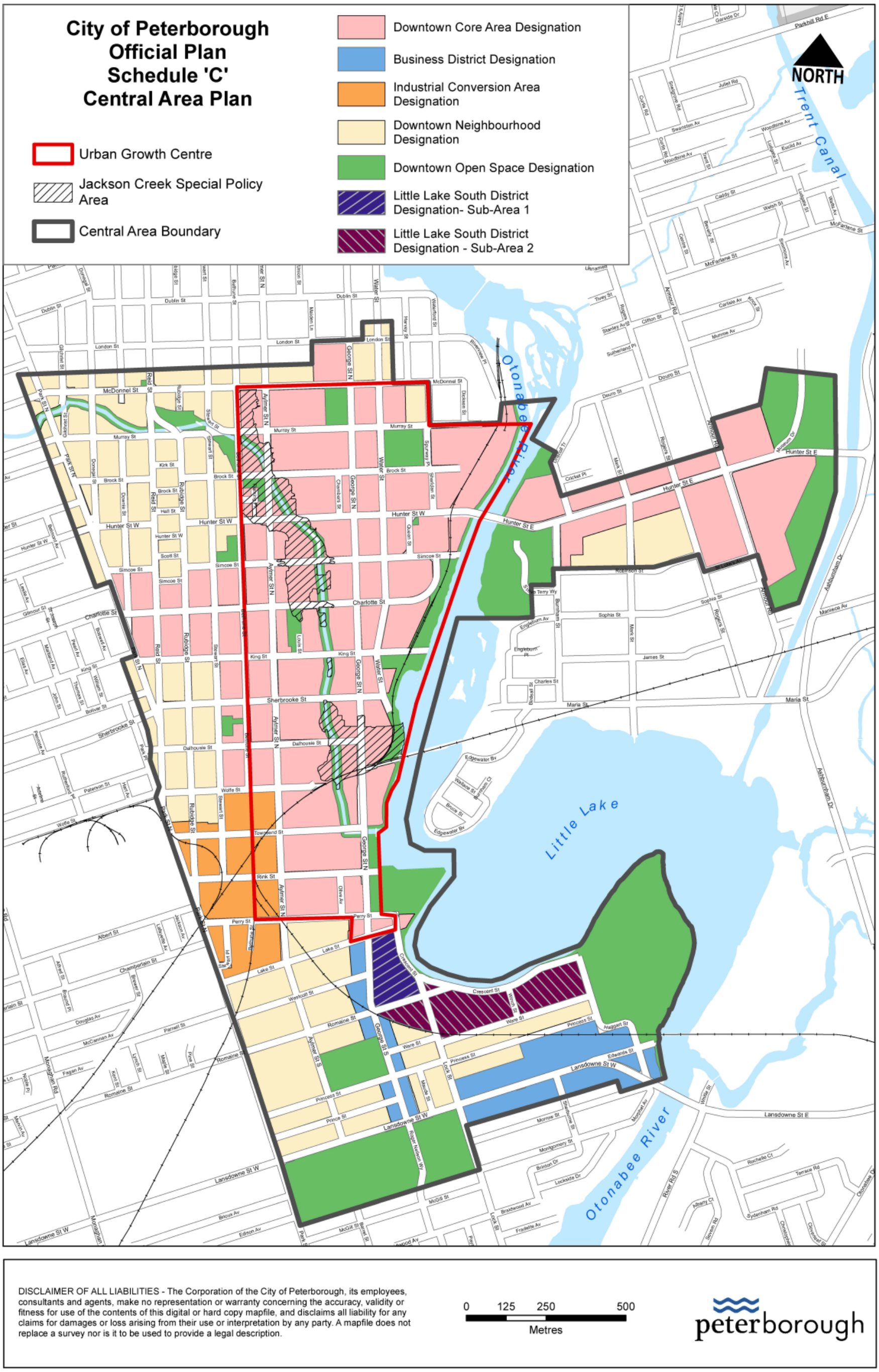


Figure 2-4: City of Peterborough 2023 Official Plan Schedule 'C' Central Area Plan

2.5 Natural Heritage

A desktop Natural Heritage Background Review of the Study Area was completed by GEI Consultants Canada (GEI) in March 2025; the report is provided in **Appendix A**.

This review was intended to identify any constraints related to natural heritage features that may impact development or infrastructure projects and to determine the need for further detailed area studies.

2.5.1 Natural Heritage Policy

The Study Area is located within the Otonabee Region Conservation Authority (ORCA) jurisdiction. Key considerations for natural heritage features related to planning for infrastructure servicing are identified in the following acts and policies that are further described under **Section 3**, Planning Context.

Relevant Federal Legislation:

- *Department of Transport Act* (1985)
  - Historic Canals Regulations (SOR/93-220)
  - *Rideau Canal and Trent-Severn Waterway National Historic Sites of Canada Policies for In-Water and Shoreline Works and Related Activities* (Parks Canada, 2007)
- *Species at Risk Act* (2002)
- *Migratory Birds Convention Act* (1994)
  - Migratory Birds Regulations (2022)
- *Fisheries Act* (1985)

Relevant Provincial Legislation:

- *Planning Act* (1990)
  - *Provincial Planning Statement* (2024)
- *Endangered Species Act* (2007)
- *Conservation Authorities Act* (1990)
  - *Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits*
  - *DRAFT Watershed Planning & Procedures Manual* (Otonabee Region Conservation Authority, 2025)

Relevant Municipal Legislation:

- *City of Peterborough Official Plan* (2023)

- *County of Peterborough Official Plan* (1994, Consolidated 2022)
- *County Official Plan* (Peterborough County, 2022; Not yet approved by MMAH)
- *Township of Otonabee-South Monaghan Official Plan* (2013, Consolidated 2017)
- *Official Plan for the Township of Cavan Monaghan* (2015, Amended 2021)

2.5.2 Natural Heritage Features and Areas

A summary of nature heritage features that were recorded through background review in or within 120 m of the Study Area are summarized below. Maps of the features are provided in the Natural Heritage Review report appendices.

- **Natural Heritage Systems**: natural area, waterbodies/watercourses, regional connections and proximity linkages within the City are mapped within each of the Official Plans.
- **Woodlands:** numerous woodland units and hedgerows are present. Additional woodlands, including those that are significant may also be present.
- **Provincially Significant Wetlands***:* Nassau Wetland Complex, the Loggerhead Marsh, Harper Creek Wetland, Cold Springs and Yankee Bonnet Wetland, Peterborough Airport Wetland Complex, Otonabee Midriver Complex, Downer's Corners Provincially Significant Wetland, Jackson Creek Provincially Significant Wetland, Jackson Creek East Provincially Significant Wetland, and the Kiiktaanaa Mash'ing Wetland Complex.
- **Other Wetlands:** numerous other evaluated wetlands including the Burnham Wood, Otonabee River Floodplain Swamp Complex, Cavan Creek Outlet Swamp, Crystal Springs Wetland Complex, as well as unevaluated wetlands.
- **Watercourses**: the Otonabee River and its associated tributaries is the main watercourse flowing through the Study Area. Watercourses in this watershed include warm and cold thermal regime creeks and streams. There are several small, naturally occurring waterbodies including Lily Lake and Little Lake.
- **Significant Valleylands**: Otonabee River Valley and Jackson Creek Valley are identified within the *City of Peterborough Official Plan*.
- **Other Valleylands**: may be associated with the larger watercourses identified above.
- **Fish Habitat**: Harper Creek contains a unique coldwater urban Brook Trout system. Other fish habitat is not identified within the Official Plans but is assumed to occur within the aquatic features present (watercourses, waterbodies, wetlands, etc.).
- **Areas of Natural and Scientific Interest:** none identified.
- **Linkages:** regional and proximity linkages are identified in the *City of Peterborough Official Plan*.
- **Minimum Vegetation Protection Zones:** may be associated with the natural heritage features listed above.

2.5.3 Rare Species Records

Rare species on or within 120 m of the Study Area were identified from a search of federally and/or provincially significant plants, vegetation communities and wildlife databases. Records identified rare species of birds, insects, fish, reptiles/amphibians, and plants on or adjacent to the Study Area. Of these records, 16 species were listed as Endangered and 11 as Threatened on the Species at Risk (SAR) in Ontario list.

2.5.4 Future Natural Heritage Studies

The Natural Heritage Background Review Report (**Appendix A1**) screens seven proposed projects for ecological constraints. Where ecological constraints are present, a list of additional studies, and permitting and approvals required has been included. For some projects, where the complete avoidance of natural features is not possible, appropriate site-specific studies may be required. This may include field data collection to confirm the extent of natural heritage features where servicing projects are proposed. Additional studies that have been identified include fish community assessments, Ecological Land Classification, species at risk and significant wildlife habitat screenings, tree inventories, and the verification of boundaries of wetlands and woodlands. Supporting reports that have been identified include arborist reports, sediment and erosion control plans, environmental impact studies, and municipal class environmental assessments. Permits and approvals may be required from ORCA, DFO, MECP, and MNR.

2.6 Cultural Heritage Screening

A Cultural Heritage Screening Report (CHSR) for the Study Area was completed by Parslow Heritage Consultancy Inc (Parslow) in November 2023 and is included in **Appendix A2**. The report determined that the Study Area contains a substantial number of properties that exhibit cultural heritage value or interest represented by a mix of Listed Heritage Properties, Designated Heritage Properties, a Heritage Conservation District, and a number of known cemeteries and Indigenous burial sites. The study area also contains undocumented properties of potential cultural heritage value. **Figure 2-5** provides an overview of heritage features within the Study Area; the CHSR contains detailed maps of 16 key areas.

The provincial government's Bill 23, the More Homes Built Faster Act 2022, proposed amendments to the Ontario Heritage Act, which were proclaimed into force in January 2023. One of the significant impacts of the amendments is a two-year time limitation on the listing of heritage properties. Listed (i.e., non-designated) properties currently included on a municipal register would have to be removed if council does not issue a notice of intention to designate within two years of the amendments coming into force.

Parslow's revised CHSR recommendations for the Study Area are as follows:

- For site-specific undertakings where there may be impacts to both known and potential built heritage resources and cultural heritage landscapes, a Cultural Heritage Evaluation Report (CHER) should be prepared to determine whether the property has cultural heritage value or interest.
    - If the property (or project area) is determined to be of cultural heritage value or interest and alterations or development is proposed, MCM recommends that a Heritage Impact Assessment (HIA) be undertaken to assess potential project impacts.
- For projects involving a larger area (e.g., a corridor), a Cultural Heritage Report (CHR) may be more appropriate to assess multiple properties.

The number of properties requiring these two assessments will be determined upon updating of the CHSR once areas of potential capital projects are identified.

Potential impacts to heritage resources due to ground disturbing work are deemed low as long as activities are confined to the municipal rights-of-way. Pre-construction vibration assessment and

vibration monitoring during construction is recommended for future projects that are near built structures that may have cultural heritage value as identified in the CHSR and subsequent evaluation.

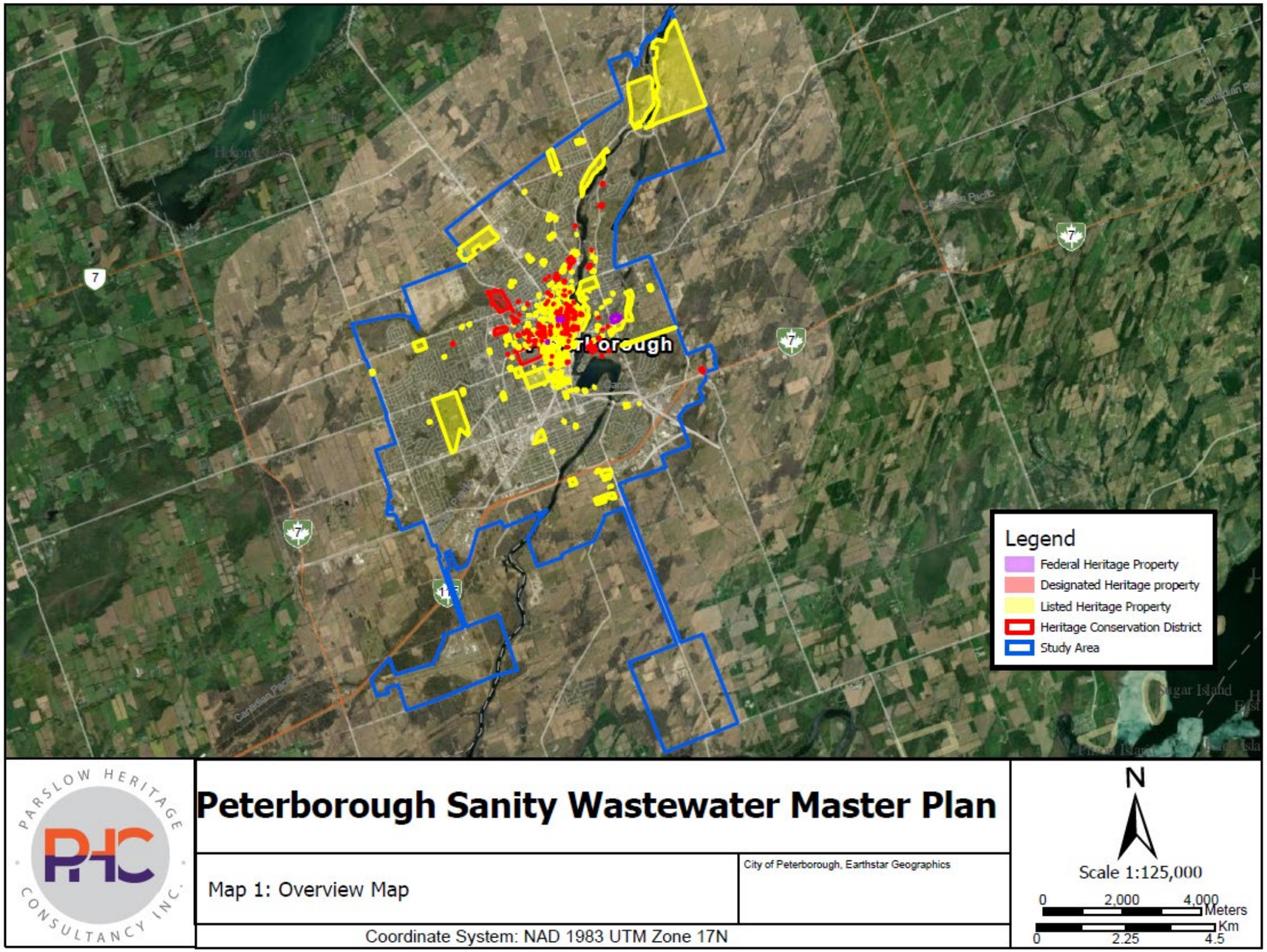


Figure 2-5 Overview Map of Cultural Features

2.7 Archaeological Assessment

A draft Stage 1 Archaeological Assessment for the Study Area was completed by Parslow Heritage Consultancy Inc (Parslow) in November 2023 and is included in **Appendix C**. The assessment identified over 100 registered archeological sites, which are known to have significant cultural heritage value or interest. To determine locations where unrecorded archaeological sites are most likely to be found, locations of archeological sites, historic transportation routes, and watercourses were consolidated to map the archeological potential within the Study Area and adjacent 1 km (refer to map in **Figure 2-6**).

Recommendations of the draft Stage 1 Archaeological Assessment include completing a Stage 2 Archeological Assessment for portions of the Study Area that retain archaeological potential prior to future ground disturbance. Since portions of the Study Area identified as disturbed could have remaining archeological soils, additional Stage 2 Archeological Assessment or construction monitoring is required to make determinations about the severity of previous impacts as they relate to archaeological potential assessments.

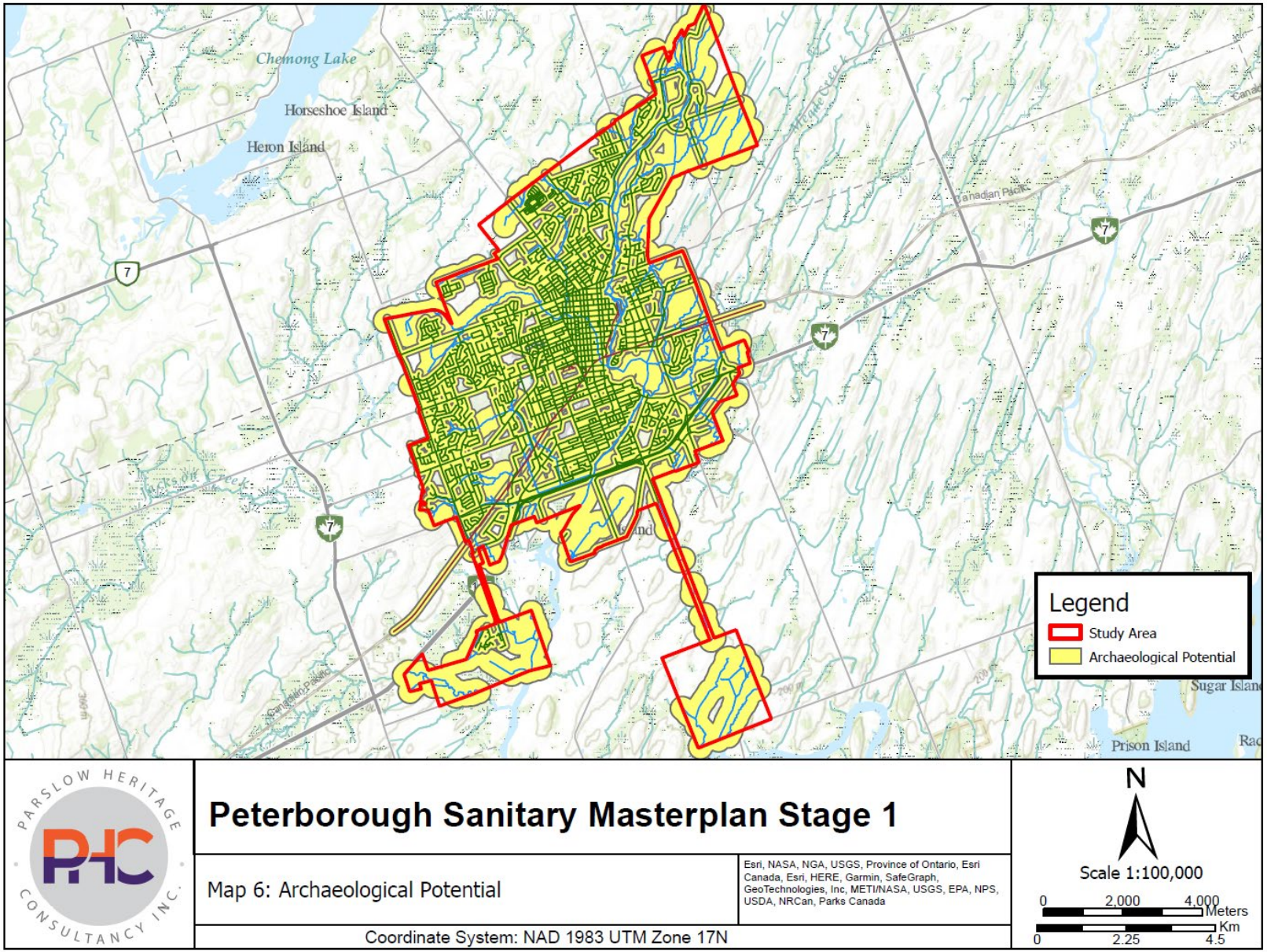


Figure 2-6: Archeological Potential Map Overview of Study Area and Adjacent 1 km Area

3 Planning Context

3.1 Federal Legislation and Policy Context

While there are no federally regulated lands within the Study Area, the Parks Canada Agency has ownership and jurisdiction over the bed of the Trent-Severn Waterway. Other federal legislation, as described below, may also apply in specific situations within provincially regulated lands.

3.1.1 Constitution Act (1867 to 1982)

The Consolidation of the *Constitution Acts, 1867 to 1982* contains the *Constitution Act, 1867* (formerly the *British North America Act, 1867*), the *Canada Act 1982*, the *Constitution Act, 1982*, and the *Canadian Charter of Rights and Freedoms* and other provisions. Section 35 of the *Constitution Act, 1982* recognizes the rights of First Nations, Inuit, and Métis, provides protection for historic and modern treaties, and is the basis for the modern-day duty to consult indigenous nations.

The Study Area contains lands that are subject to Rice Lake Treaty No. 20 (1818) and the Williams Treaties in 1923; collectively known as the Williams Treaties First Nation and includes the traditional territory of Alderville, Beausoleil, Curve Lake, Georgina Island, Hiawatha, Rama and Scugog Island First Nations. As per Section 35 of the *Constitution Act* (1982), Peoples with Treaty Rights must be consulted and accommodated prior to conducting any activities that could impact the rights or interests of Indigenous Peoples on the territory.

3.1.2 Department of Transport Act (1985)

The *Department of Transport Act* (1985) and *Historic Canals Regulations* (SOR/93-220), administered by the Parks Canada Agency, applies to “the bed of the Trent-Severn Waterway and its lakes and rivers to the original upper controlled water elevation” (Parks Canada Agency, 2024). Any in-water, shoreline works, or related activities are subject to the *Rideau Canal and Trent-Severn Waterway National Historic Sites of Canada Policies for In-Water and Shoreline Works and Related Activities* (Parks Canada, 2007).

3.1.3 Species at Risk Act

The *Species at Risk Act* (SARA) focuses on restoring and maintaining populations of species that are at risk of extinction or extirpation due to human activity such as habitat destruction, hunting, introduction of competing species, or other anthropogenic causes.

The SARA incorporates several prohibitions to protect individuals of listed threatened (THR), endangered (END), or extirpated species at risk (SAR), as designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) by using biological information on a species deemed to be in danger. The COSEWIC reviews research information on population and habitat status, trends and threats and applies assessment criteria based on international standards. Once a species is added to *Schedule 1 – List of Wildlife Species at Risk*, it benefits from legal protection afforded and the mandatory recovery planning required under the Act. Per Section 34, Section 58, and Section 61, these prohibitions apply to aquatic species and migratory birds protected by the *Migratory Birds Convention Act* (MBCA) on all lands, and any other listed wildlife species when on federal lands.

3.1.4 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (MBCA) was established in 1917, and last amended in 2024, to protect migratory birds, their eggs, their nests and prohibit the deposit of harmful substances in waters and areas frequented by them. The MBCA lists protected families and subfamilies of migratory birds and lays out legislation surrounding activities that may impact migratory birds or nests, including when and where activities may occur. Any tree removals required for construction of the preferred solution will be completed outside of the breeding bird season (April 1 to August 30) to avoid disturbing active nests of migratory birds protected under the MBCA.

3.1.5 Fisheries Act

The Fisheries Act provides provisions on the conservation and protection of freshwater and marine fish habitat in order to sustain fish species. In 2013, the Fisheries Policy statement was released to support the changes made to the Fisheries Act in 2012. The changes made to the Fisheries Act focuses on the protection of the productivity of commercial, recreational, and Aboriginal fisheries, improved implements for both compliance and protection, enhanced stakeholder partnerships (e.g., government agencies, local groups), and ensuring regulatory requirements are clear and consistent. In 2018, amendments for restoration of lost protections and incorporation of modern safeguards were proposed. The Fisheries Act received royal assent and became law as of June 21, 2019.

Developed under the Fisheries Act is the Wastewater Systems Effluent Regulations which aims to deliver on a federal commitment in the 2009 Canadian Council of Ministers for the Environment (CCME) Canada-wide Strategy for the Management of Municipal Wastewater Effluent to establish national baseline effluent quality limits. It requires that all facilities achieve minimum National Performance Standards and develop and manage site-specific Effluent Discharge Objectives. The strategy requires that overflow frequencies for sanitary sewers are not increased due to development or redevelopment. Overflows should not occur during dry weather, except during spring thaw and emergencies. Source control of pollutants is recommended, and monitoring and reporting on effluent quality is required. The 2014 Progress Report outlined the progress made by signatory federal, provincial, and territorial jurisdictions on the commitments made in the 2009 Strategy.

3.1.6 Bay of Quinte Remedial Action Plan

The Otonabee River, which passes through the City, is a tributary to the Trent River which discharges into the Bay of Quinte. The Bay of Quinte was designated an Area of Concern in 1985 by the International Joint Commission (a Canadian-American organization established to cooperatively manage and protect waters affecting both countries) under the Great Lakes Water Quality Agreement (1972). Areas of Concern are communities, bays and rivers on the Great Lakes system where human activities have severely damaged the quality of the environment. Environmental concerns in the Bay of Quinte are due to excess nutrients, persistent toxic contamination, bacterial contamination and the loss or destruction of fish and wildlife habitat.

The Bay of Quinte Remedial Action Plan (BQRAP) was initiated in 1985 and aims to remove the Area of Concern designation through ecological restoration works. It is managed and implemented jointly by Environment and Climate Change Canada and the MECP. As part of this plan, a phosphorus management strategy was developed to set long term phosphorus concentration and loading targets. The recommended phosphorus management actions described in the *"Draft Discussion Paper – A Long-Term Phosphorus Management Strategy of the Bay of Quinte"* involve

reducing point source phosphorus loadings by sewage treatment plants by 60% based on current Environmental Compliance Approval (ECA) limits. This equates to maintaining a phosphorus effluent limit of 0.1 mg Total Phosphorus (TP) per litre as an objective for all WWTPs that discharge into the Bay of Quinte watershed, including the Peterborough WWTP.

3.2 Provincial Legislation and Policy Context

3.2.1 Planning Act

The *Planning Act*, *1990* (Amended 2024) establishes a land use planning system led by provincial policy and allows for the integration of matters of provincial interest into provincial and municipal planning decisions. The *Planning Act* also defines the roles and responsibilities of the province and municipalities, as listed below:

Provincial Responsibility

- Issuance of the Provincial Policy (Planning) Statements;
- Promotion of provincial interests;
- Preparation of provincial plans, such as the Greenbelt Plan
- Provision of advice to municipalities and the public on land use planning issues; and,
- Administration of local planning controls and approvals where required.

Municipal Responsibility

- Make local planning decisions for future communities;
- Preparation of planning documents such as Official Plans and Zoning By-Laws; and,
- Ensure that planning decisions and documents are consistent with the *Provincial Planning Statement* and conform or do not conflict with provincial plans.

3.2.2 Provincial Planning Statement

The Province of Ontario released the *Provincial Planning Statement* (PPS; MMAH, 2024) which came into effect on October 20, 2024. This document replaces the previous *Provincial Policy Statement* (2020) and *A Place to Grow: Growth Plan for the Greater Golden Horseshoe* (2020). The PPS provides an overview of the land use goals and objectives for the province of Ontario to the year 2031 and provides policy direction for land use planning matters related to provincial interests. It includes key chapters outline how the province will achieve their goals for the creation of strong and competitive communities, development of appropriate infrastructure and facilities, wise use and management of resources, and the protection of public health and safety. The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together.

Key general infrastructure policies included in the PPS relevant to water and wastewater services include the following:

- Infrastructure and public service facilities shall be provided in an efficient manner while accommodating projected needs;
- Planning for infrastructure and public service facilities shall be coordinated and integrated with land use planning and growth management so that they:
    - are financially viable over their life cycle, which may be demonstrated through asset management planning;
    - leverage the capacity of development proponents, where appropriate; and,
    - are available to meet current and projected needs.
- Before consideration is given to developing new infrastructure and public service facilities:

  - the use of existing infrastructure and public service facilities should be optimized; and,
  - opportunities for adaptive re-use should be considered, wherever feasible.
- Infrastructure and public service facilities should be strategically located to support the effective and efficient delivery of emergency management services, and to ensure the protection of public health and safety in accordance with the policies in Chapter 5: Protecting Public Health and Safety; and,
- Public service facilities should be co-located to promote cost-effectiveness and facilitate service integration, access to transit and active transportation.

More specifically, the PPS recommended that water and wastewater services should:

- Accommodate forecasted growth in a timely manner that promotes the efficient use and optimization of existing municipal sewage services and municipal water services and existing private communal sewage services and private communal water services;
- Ensure that these services are provided in a manner that:
  - can be sustained by the water resources upon which such services rely;
  - is feasible and financially viable over their life cycle;
  - protects human health and safety, and the natural environment, including the quality and quantity of water; and,
  - aligns with comprehensive municipal planning for these services, where applicable.
- Promote water and energy conservation and efficiency;
  - integrate servicing and land use considerations at all stages of the planning process;
  - consider opportunities to allocate, and re-allocate if necessary, the unused system capacity of municipal water services and municipal sewage services to support efficient use of these services to meet current and projected needs for increased housing supply; and,
  - be in accordance with the servicing options outlined through policies 3.6.2, 3.6.3, 3.6.4 and 3.6.5.

The PPS marks a shift towards local autonomy in planning while incentivizing infrastructure projects that enable rapid housing and economic growth. Where applicable, the PPS provides opportunities for infrastructure projects supporting transit, utilities, and settlement expansion that align with the growth goals.

3.2.3 Environmental Assessment Act

The *Environmental Assessment Act*, 1990 (Amended 2024) has the purpose of the betterment of the people of Ontario by providing for the protection, conservation and wise management of the environment. It outlines three general pathways for a project, a Class Environmental Assessment, a Comprehensive Environmental Assessment, and a Streamlined Environmental Assessment (not yet enforce). The Class Environmental Assessment is further subdivided into several categories, including the Municipal Class Environmental Assessment (MCEA), which is the process generally used for municipal infrastructure and servicing projects.

The *Municipal Class Environmental Assessment Guideline* (2023) is managed by the Municipal Engineers Association, and includes municipal road, water, and wastewater projects. Projects are classified into four categories:

- **Exempt projects** are minor in nature, and include maintenance, operational activities, rehabilitation, and replacement of existing facilities, as well as new facilities that are limited in scale and have minimal adverse effects on the environment.
- **Projects that are eligible for screening** must fully and accurately complete the screening process to determine whether they are exempt or whether a Schedule B/C is required.
- **Schedule B projects** have some potential for adverse environmental effects and generally include improvements and minor expansions to existing facilities. These projects follow a scoped MCEA process.
- **Schedule C projects** have the potential for more significant environmental effects and the full planning and documentation process is required under the MCEA.

Table B of the MCEA Guideline (Municipal Engineers Association, 2023) outlines the screening criteria for Municipal Water and Wastewater Projects. Row 22a-c reflect projects that "*establish, extend, or enlarge a sewage collection system and all works necessary to connect the system to an existing sewage outlet"*. Where all facilities are located within an existing road allowance or an existing utility corridor AND trenchless technology is used for all water crossings, the project is exempt (Row 22b). Where facilities are not located within an existing road allowance, or existing utility corridor, these projects are considered a Schedule B. Watercourse crossings for the purpose of water and wastewater projects have been defined as: "*a sewage, stormwater management or water facility or a component thereof, which crosses over, under or through a naturally occurring water body or surface drainage feature such as a lake, swamp, marsh, bay, river, creek, stream or man-made drainage facility such as a ditch, canal or municipal drain*" under the MCEA guideline.

3.2.4 Endangered Species Act

The *Endangered Species Act* (ESA; 2007) was developed to identify and protect species at risk and their habitats, and to promote stewardship activities that support those protection and recovery efforts. The ESA protects all Threatened, Endangered and Extirpated species listed on the Species at Risk in Ontario (SARO) list (Government of Ontario 2007b). These species are legally protected from harm or harassment, and their associated habitats are legally protected from damage or destruction, as defined under the ESA. The Ministry of Environment, Conservation, and Parks manages the ESA and its regulations.

3.2.5 Environmental Protection Act

The *Environmental Protection Act*, 1990 (EPA; Amended 2024) was enacted by the Province of Ontario to provide for the protection and conservation of the natural environment. Under Section 6(1) of the Act, "*No person shall discharge into the natural environment any contaminant, and no person responsible for a source of contaminant shall permit the discharge into the natural environment of any contaminant from the source of contaminant, in an amount, concentration or level in excess of that prescribed by the regulations".*

In conjunction with the *Ontario Water Resources Act, 1990,* the EPA provides exemptions for projects that complete an Environmental Compliance Approval (ECA). A Consolidated Linear Infrastructure ECA (CLI ECA) is one of the many types of ECA's, and is generally completed for municipal sewage collection systems, but does not apply to municipal sewage treatment plants or privately owned systems.

3.2.6 Ontario Water Resources Act

The *Ontario Water Resources Act, 1990,* (Amended 2021) provides for the conservation, protection and management of Ontario's waters and for their efficient and sustainable use, in order to promote

Ontario's long-term environmental, social and economic well-being. It provides policy direction and regulations for the efficient use of water, management of wells, water quality, water taking, sewage works, and others. It works in conjunction with the *Environmental Protection Act*, 1990, to manage and regulate sewage works in the province (Section 53 through 62).

There are a number of guidelines and procedures relating to municipal sewage works that have been issued under the act, including *F-5-1 Determination of Treatment Requirements for Municipal and Private Sewage Treatment Works* (MECP, 2016).

3.2.6.1 Procedure F-5-1

Procedure *F-5-1 Determination of Treatment Requirements for Municipal and Private Sewage Treatment Works* is a guideline that was prepared by the MECP in 2016 (updated in 2021), which outlines the treatment requirements for municipal and private sewage treatment works discharging to surface waters. Effluent requirements are established on a case-by-case basis considering the characteristics of the receiving water body. Guideline F-5 takes the approach that all sewage treatment works should provide secondary treatment or equivalent as the "normal" level of treatment unless individual receiving water assessment studies indicate the need for higher levels of treatment. Existing works not complying with this Guideline are required to upgrade as soon as possible.

This procedure gives Effluent Design Objectives for biochemical oxygen demand (BOD), suspended solids, total phosphorus, and Effluent Guidelines for the former two. An Effluent Design Objective for ammonia is given for conventional activated sludge treatment with nitrification. Sewage treatment works designed according to the Ministry "Guidelines for the Design of Sewage Treatment Works" should be able to produce annual average effluent quality approximately equal to the Effluent Design Objectives, but not to exceed the Effluent Guidelines criteria.

3.2.7 Sustainable Water and Wastewater Systems Improvement and Maintenance Act

The *Sustainable Water and Sewage Systems Act* (2002) legislates financial planning and sustainability of municipal water and wastewater systems and specifies reporting requirements. In 2010, Bill 13 *Sustainable Water and Wastewater Systems Improvement and Maintenance Act* repealed the 2002 act.

Key purposes of Bill 13 are as follows:

- Sets out the purposes of the Act, which include ensuring that public ownership of water services and wastewater services is maintained;
- Establishes the Ontario Water Board as an agent of the Crown and sets out the Board's objectives, powers and duties which relate to the regulation of water services and wastewater services;
- Sets out the responsibilities of municipalities or groups of municipalities that are designated as regulated entities by regulation; and,
- Regulated entities must prepare business plans for the provision of water services or wastewater services. The plan must contain, among other things, an assessment of the full cost of providing water services or wastewater services to the public and a description of how the regulated entity intends to pay this full cost.

3.2.8 Conservation Authorities Act

The legislative mandate of the Conservation Authority, as set out in Section 20 of the *Conservation Authorities Act*, 1990 (Amended 2024) is to establish and undertake programs designed to further the conservation, restoration, development, and management of natural resources. Conservation Authorities are local agencies that protect and manage water and other natural resources at the watershed level. These agencies have a number of responsibilities and functions in the land use planning and development process.

The Study Area is located within the Otonabee Region Conservation Authority (ORCA) jurisdiction. The Otonabee Region Watershed covers an area of approximately 2000 km^2 and includes the sub-watersheds of the Otonabee, Indian, and Ouse Rivers. Through Section 28 of the *Conservation Authorities Act,* ORCA is responsible for administering Ontario Regulation 41/24: *Prohibited Activities, Exemptions and Permits* (O. Reg. 41/24).

3.3 Municipal Legislation

While the Study Area is mostly located within the single tier municipality of the City of Peterborough (the City) and subject to the *City of Peterborough Official Plan* (2023), portions of the study area, including the Peterborough Landfill site and the Peterborough Airport site, are located outside of the City. These additional Official Plans, as outlined in **Table 3-1** below have been reviewed for provisions related to public infrastructure planning and natural heritage priorities.

Table 3-1 Municipalities located within the Study Area

Study Area	Sub-Study Area	Single Tier Municipality	Upper Tier Municipality	Lower Tier Municipality
Study Area	City of Peterborough	City of Peterborough		
	Peterborough Landfill Site (all)		County of Peterborough	Township of Otonabee-South Monaghan
	Peterborough Airport Site (western lands)		County of Peterborough	Township of Cavan Monaghan, and the
	Peterborough Airport Site (eastern lands)			Township of Otonabee-South Monaghan

3.3.1 City of Peterborough Official Plan

The *City of Peterborough Official Plan,* (2023) is designed to be a guiding document to provide direction on the management of communities, land-use changes and physical development. The Province of Ontario approved the City of Peterborough's OP with modifications on April 11, 2023. On November 16, 2023, the Province introduced Bill 150, the Planning Statute Law Amendment Act, 2023 that reversed the City's OP decisions made in April 2023.

Section 1.1 outlines the City's population and employment growth projections and its growth approach. The City OP identifies Strategic Growth Areas, which will be the focus of higher density forms of intensification and will have secondary plans developed. The OP identifies major development and redevelopment opportunities that may include infill, brownfield sites, the expansion or conversion of existing buildings, greyfields, or the development of new mixed-use, higher density corridors and centres serving emerging greenfield communities. The OP's

Designated Greenfield Areas are expected to accommodate a maximum of 50 percent of the City's residential growth to 2051.

Within the *City of Peterborough Official Plan, 2023*, Natural Heritage Systems are defined as "*a system made up of natural heritage features and areas, and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems."* As per Section 6.1.2.f and Section 4.6.2.l of the City OP municipal infrastructure projects should avoid areas designated as Natural Areas, however they may be permitted where they have been identified within the City OP and/or an approved Environmental Assessment and they are subject to the completion of a satisfactory Environmental Impact Study.

3.3.2 County of Peterborough Official Plan (1994, Amended 2022)

The County of Peterborough has recently undergone Official Plan updates, including the preparation of the *County Official Plan,* which was adopted by Council in 2022, but is still awaiting approval from the Minister of MMAH. Until such time, the 1994 *County of Peterborough Official Plan* remains in force. Natural Heritage goals and policies are identified within Section 4.1 of the County OP and aim to "*protect and enhance natural features and ecological systems, conserve natural resources, reduce pollution, and protect people and property from environmental hazards*".

3.3.3 County of Peterborough Official Plan (2022, not yet in force)

As mentioned above, the *County of Peterborough Official Plan* was adopted by Council in 2022 but has not yet been approved by the Minister of MMAH.

It sets the land use and planning framework for local Official Plans and decision-making, and its policies are broad and meant to guide local Townships in creating detailed policies in their own Official Plans. The OP indicates local municipalities shall establish water and sewer service schedules in local Official Plans and monitor collection and treatment capacities.

The County's OP was reviewed for provisions related to public infrastructure planning and natural heritage priorities. The County of Peterborough OP (2022) designates the Peterborough Landfill site as a Waste Management Area, with a Natural Heritage System (NHS) Overlay that includes a locally significant wetland (outlined in Map OSM-3 'Land Use Schedule' and 'Schedule – Land Use Plan – County's Proposed Refined NHS'). The OP's permitted uses of the Waste Management Area land is for predominantly solid waste disposal. Construction of buildings, structures and hard surface paving is permitted if sufficient background investigations are completed. The OP requires an environmental impact assessment to be completed for proposed development in or adjacent to natural heritage features including all lands within 120 m of significant wetlands.

3.3.4 Township of Otonabee-South Monaghan Official Plan (2003)

The *Township of Otonabee-South Monaghan Official Plan* was prepared in 2003 and covers a 20-year planning period to the year 2023. It outlines objectives for the environment, use and management of natural resources, preservation of agricultural and rural communities, economic development, provision of culture, recreation and community social needs, tourism, transportation, public utilities and infrastructure, and community improvement.

Once approved by the Minister of Municipal Affairs and Housing, the *County Official Plan* (Peterborough County, 2022) will replace the *Township of Otonabee-South Monaghan Official Plan* (2003).

3.3.5 Township of Cavan Monaghan Official Plan (2015)

The *Official Plan for the Township of Cavan Monaghan* (2015) was approved by the County of Peterborough in 2013 and the Ontario Municipal Board in 2015, and has been amended recently, in 2021. Although the Township of Cavan Monaghan falls within Peterborough County, the Township opted to maintain their own separate OP. The goals of the plan are to build a sense of community in the Township, preserve the rural character, protect and preserve the natural environment, improve the economy, ensure development is attractive, accessible, and reflects the historic character of the Township, and manage change in a manner that has the greatest positive impact on the Township.

The Township's OP list's the Peterborough Airport to contain Natural Core Area designations and a NHS overlay that includes provincially and locally significant wetlands. The OP's Natural Core Area designation is intended to recognize wetlands and streams, together with lands that form a vegetation protection zone around these key hydrologic features. Permitted uses within the Natural Core Area include infrastructure uses, amongst others.

The OP defines planning priorities related to water and sanitary servicing as follows:

> "*Planning for sewage and water services shall promote efficient use and optimization of existing water and sewage infrastructure. These systems should be provided in a manner that can be sustained by the water resources upon which such services rely, prepares for the impacts of changing climate, is feasible and financially viable over their lifecycle and protects human health and safety and the natural environment."*

Section 6.2.e of the *Township of Cavan Monaghan Official Plan,* 2015, outlines that all infrastructure subject to and approved under the *Environmental Assessment Act*, the *Planning Act*, or others, are permitted within the NHS where it serves the significant growth and economic development expected in Southern Ontario.

4 Existing Sanitary System

4.1 Overview

The City of Peterborough's existing sanitary system consists of trunk sewers, local sewers, SPSs, forcemains, and wet-weather inceptor tanks which discharge to a single WWTP. An overview of the existing collection system was shown previously in **Figure 2-1**.

4.2 Sanitary Collection System

The sanitary system is distinctively separated, meaning that it exclusively manages sewage without combining it with stormwater. This aspect of the system is crucial in managing flows effectively and reducing the potential for sanitary surcharge, basement flooding and overflow of sewage into the river associated with a combined sewer system, especially during heavy rainfall. Additionally, the City's sanitary system includes two inverted siphons: one crossing the Otonabee River near Trent University and another crossing Jackson Creek north of Little Lake on George Street. The siphons demonstrate the City's existing approach to addressing geographical challenges for conveyance within the sanitary system.

The collection system including 10 SPSs within the City operates under a Consolidated Linear Infrastructure (CLI) ECA No. 145-W601 issued August 11, 2022. Per the CLI ECA, the City's sanitary collection system consists of trunk sewers, separate sewers (i.e., collect only sanitary flows), partially separate sewers (i.e., retrofitted to collect stormwater from roof leaders or foundation drains and are considered combined sewers), nominally separate sewers (i.e., have connections to roof leaders and foundation drains but are not considered combined sewers), SPSs, wet-weather interceptor tanks, and forcemains which discharge to a single WWTP. The City's sanitary system does not have combined sewers.

The Burnham Meadows pumping station at Television Rd and Old Norwood Rd serves the subdivision in Otonabee-South Monaghan Township bordering the City operates under ECA No. 5631-95HS8M issued April 30, 2013. This station is operated by the City, is but outside of the study area. Because it discharges into the municipal sewer within the Study Area, it is considered a contributing source of flow, but capacity needs for this station were not considered. The study area also incorporates three sewage pumping stations and forcemains outside of the CLI ECA located at Beavermead Park Campground (managed by Otonabee Conservation), 182 Townsend Street (Public Works Garbage and Greenwaste Collection Depot) and at the Peterborough Airport. ECAs are not available for these SPSs. Of these three stations, only the Airport SPS is considered under the SMP as it is owned and operated by the City.

The wastewater is collected via one of two general drainage paths, the first collecting sewage from the western side of the City and flowing to the Park St Bypass Station, and the second generally collecting sewage from the area east of the Otonabee River. Existing sewage pumping stations are summarized in **Table 4-1**.

Table 4-1 Existing Sewage Pumping Stations in City of Peterborough(1)

Name and Location	Firm Capacity (L/s)	Emergency Storage Capacity (m^3)	Forcemain	Description
CLI ECA 145-W601 (Issued August 11, 2022)				
Parkhill West SPS (1100 Parkhill Rd. W)	405.2	37	400 mm dia. Approx. 474 m long	Wet well has two cell each 5 m long, 5 m wide, and 14.6 deep. Station has 4 submersible pumps (3 duty, 1 standby), each capable of handling 135 L/s at a TDH of 49 m. Valve chamber contains flow meter. Overflow to Jackson Creek provided via a 450 mm pipe and overflow storage tank. Standby power provided by 650 kW diesel generator and 1800 L fuel tank.
Valleyview Drive SPS (850 Valleyview Dr.)	23.2	N/A	200 mm dia.	Two submersible pumps (1 duty, 1 standby) each capable of pumping 23.2 L/s at 14 m total head. One wet well of 8.8 m^3 capacity. Station has no overflow pipe. Overflowing sewage would discharge to Jackson Creek via hatches and overland flow. Standby power via portable generator connection.
Parkhill East SPS (43 Parkhill Rd W)	12.62	43.8	152 mm dia.	Two submersible pumps (1 duty, 1 standby) each capable of pumping 12.62 L/s at 7.92 m total head. One wet well of 2.23 m^3 capacity. Bypass fixture adjacent to the collector manhole 6.1 m north station allows for portable pump connection to existing forcemain. Overflow discharges to storage tank prior to overflow into the Otonabee River. Standby power provided via portable generator connection.
Simcoe Street SPS (73 Simcoe St.)	62	N/A	200 mm dia. Approx. 120 m long	Two submersible pumps (1 duty, 1 standby) each capable of pumping 62 L/s at 20 m total head. One wet well of 9.4 m^3 capacity. Two flow meters installed. Overflow provided via storm sewer manhole discharging to the Otonabee River. Standby power provided via 70 kW natural gas generator.
Engleburn SPS (279 Engleburn Ave.)	13.88	N/A	203 mm dia. Approx. 98 m long	Two pumps (1 duty, 1 standby) each capable of pumping 13.88 L/s at 7.32 m total head. One wet well of 1.81 m^3 capacity. Standby power via portable generator connection.
Burnham Point SPS (64 Edgewater Blvd.)	35	20.6 (Vol. from high to overflow level alarms)	250 mm dia. Approx. 285 m long	Wet well of 20.5 m^3 capacity. Dry well with 2 pumps (1 duty, 1 standby) each capable of pumping 35 L/s at 4.8 m total head. Overflow pipe is connected to a sanitary sewer manhole discharging to the Otonabee River. Standby power provided with 60 kW natural gas generator.
Ashburnham SPS (1880 Ashburnham Dr.)	300	25 (Vol. from high to overflow level alarms)	900 mm dia. Approx. 6.9 m long	A dry well/wet well configured station with a twin chambered wet well each with 66.6 m^3 capacity. Four pumps (3 duty, 1 standby), each with 107 L/s and 6.5 m total head. Overflow discharges to a sanitary sewer manhole discharging to the south branch of Meade Creek. Standby power provided by 100 kW natural gas generator.
Montgomery SPS (95 Montgomery Rd.)	27.5	2.8 (Vol. from high to overflow level alarms)	150 mm dia. Approx. 329 m long	Two pumps (1 duty, 1 standby), each pumping 27.5 L/s at 14.0 m total head. One wet well of 7.1 m^3 capacity. Overflow discharges to the Otonabee River via a sewer connection to a storm sewer. Standby power provided by 50 kW natural gas generator.
Monaghan Road SPS (506 Monaghan Rd)	80	1.8 (Vol. from high to overflow level alarms)	200 mm dia. Approx. 138 long	Two pumps (1 duty, 1 standby) with 80 L/s and 9 m total head. Wet well of 4.3 m^3 capacity. Overflow discharge to the Otonabee River via connection to storm sewer manhole. Standby power provided by 80 kW natural gas generator.
Park Street Emergency Overflow Station (586 Park St. S)	1,136	N/A	1200 mm dia.	Station is located directly across the river from the WWTP. One diesel powered vertical dry pit pump with 1,136 L/s and 3.66 m TDH, connected to a 1200 mm discharge outlet discharging to the Otonabee River. One 250 Gallon diesel tank on site.
ECA 5631-95HS8M (Issued April 30, 2013)				
Burnham Meadows PS	12.8L/s to 21.5L/s	N/A	150 mm dia. Approx. 2400 m long	Consists of 2.4 m diameter, 7.1 m deep wet well located south of Safe Harbour Way. There are two submersible pumps each with a rated capacity of 12.8 L/s at 28.5 m TDH with allowance for replacement pumps, each with capacity 21.5 L/s at 58 m TDH. Standby power provided via connection to portable generator. Forcemain by-pass pumping connection available.
Certificate of Approval 9439-5AAPCWW (Issued May 23, 2002)				
Peterborough Airport PS	3.1	N/A	75 mm dia.	Station has a 3 m by 2.4 m wet well with two grinder submersible pumps each rated for 3.1 L/s, operating alternatively at 47.8 m TDH. A 60 kW standby diesel generator is located in a nearby fire pumping station.

Note: *(1) Station information was sourced from specified ECAs. Specific asset details at each station were not field verified under the SMP.*

4.3 Peterborough WWTP

The Peterborough WWTP is located at 425 Kennedy Road, on the south shore of the Otonabee River. The WWTP is rated for 68,200 m^3/day (68.2 MLD) and is a Class 4 Conventional Treatment Plant. The wastewater treated at the WWTP is comprised of domestic, industrial, commercial, and institutional wastewater produced in the City, leachate from the Peterborough County/City Landfill, and hauled waste (i.e., septic tank, holding tank and portable toilet wastes) from Peterborough and surrounding areas. The treated wastewater is discharged to the Otonabee River through a gravity outfall. A detailed description of the WWTP processes is provided in Technical Memo No. 2: Existing Servicing and Hydraulic Analysis.

The WWTP provides preliminary treatment through screening and grit removal, primary treatment by sedimentation, secondary treatment by a combination of conventional activated sludge and an integrated fixed film activated sludge (IFAS) process, final clarification and disinfection using ultraviolet light prior to discharge to the Otonabee River. The primary treatment and UV disinfection system are rated for 190,900 m^3/day for peak flow. The biological treatment consists of two parallel plants: Plant 1 and Plant 2. The IFAS system is equipped with a fine-pore aeration system containing free-floating rigid plastic media.

A peak flow attenuation facility was built with four inflow and infiltration (I&I) tanks in 2015 with 25,000 m^3 total capacity to store temporary primary effluent when the flow exceeds 120,000 m^3/day, rated peak flow for secondary treatment. The I&I tanks are typically filled twice per year.

The sludge produced at the WWTP is thickened by polymer and stabilized by anaerobic digestion. The biosolids produced in the digesters are dewatered by centrifuge and hauled off site for further processing.

Peterborough WWTP is operated in accordance with MECP ECA No. 0001107542, Version 1.2, issued August 31, 2020. **Table 4-2** summarizes the effluent quality objectives and limits of WWTP as per the ECA.

Table 4-2: Summary of Effluent Water Quality Criteria

Parameter	Symbol	Objectives (Concentration)	Limits (Concentration)	Limits (Loading)
Carbonaceous Biochemical Oxygen Demand (5-day)	$CBOD_5$	10 mg/L	17.5 mg/L	1,200 kg/d
Total Suspended Solids	TSS	10 mg/L	17.5 mg/L	1,200 kg/d
Total Ammonia Nitrogen	TAN	2.98 mg/L (Jun. 1 to Sep. 30)	6.0 mg/L (Jun. 1 to Sep. 30)	N/A
		5.0 mg/L (Oct. 1 to May 31)	10.0 mg/L (Oct. 1 to May 31)	
Total Phosphorus	TP	0.35 mg/L	0.39 mg/L	27 kg/d
Escherichia Coli	*E. Coli*	100 CFU/100 mL(1) (Jan. 01 to Dec. 31)	200 CFU/100 mL(1) (Jan. 01 to Dec. 31)	N/A
Un-ionized Ammonia		0.1 mg/L	N/A	N/A
pH	pH	6.5 to 8.5 inclusive	6.0 to 9.5 inclusive	N/A
Toxicity to Rainbow Trout and Daphnia magna		N/A	non-acutely lethal	N/A

Note:

(1) If the MPN method is utilized for E. coli analysis, the objective and limit shall be 100 MPN/100 mL and 200 MPN/100 mL respectively.

5 Background Review and Previous Studies

The following section provides an overview of key related studies, standards and guidelines that will impact the Sanitary Master Plan. Any capital projects recommended through the Sanitary Master Plan should consider proposed road and storm upgrade requirements and potential efficiencies in construction.

5.1 City Asset Management Plan

Asset Management Planning provides a means of guiding investment decisions to meet key strategic and operational goals and define level of service objectives. The last asset management plan was completed in 2021 and is currently in the process of being updated. The 2021 Plan noted

that the City currently meets all regulatory/legislated requirements relating to provision of services. Wastewater is the highest valued service area in the City and has an overall good condition. The current level of service targets for the City's wastewater system are summarized below:

- Wastewater does not pose a risk to health and safety of the public, demonstrated through no sewer back-ups onto private property;
- Reliable wastewater service is provided with minimal public impact demonstrated by no odour complaints, zero WWTP by-passes, and an compliance with the WWTP's ECA effluent limits and objectives;
- The sanitary system provides servicing to all areas of the City; and
- The sanitary sewers shall be resilient to impacts of inflow and infiltration, demonstrated through removing cross-connections between the storm and sanitary systems.

It is expected that the updated Asset Management Plan will be completed before the Sanitary Master Plan is completed, so the outcomes of the Asset Management Plan can be incorporated.

5.2 Central Area Urban Design Guidelines and Mixed-Use Corridors Urban Design Guidelines

In 2023, the City adopted the Central Area Urban Design Guidelines and Mixed-Use Corridors Urban Design Guidelines. Urban Design Guidelines are non-statutory statements which are general rules and recommendations to provide greater clarity on urban design, streetscapes, built form, and sustainability initiatives. The Guidelines provide additional considerations for defined Character Areas in the Central Area and corridors. Relevant guidelines for green infrastructure and buildings focus on designing for energy and resource conservation, use of third-party certifications, and use of recycled or reclaimed materials for new infrastructure. Sewer heat recovery is identified as an energy conservation consideration.

5.3 Stormwater and Inflow and Infiltration Studies

5.3.1 Flood Reduction Master Plan

In 2005, the City completed a Flood Reduction Master Plan in response to the severe rainfall and flooding event that occurred in July 2004 and caused significant property damage. In addition to insufficient storm sewer capacity, this study also linked flooding to stormwater and groundwater entering the sanitary system and exceeding its capacity. Although not verified through this study, this water was believed to enter the sanitary system through foundation drains, roof leader connections, and inflow through aging pipes and maintenance holes.

At the time of this study, during 'dry' weather, the Peterborough WWTP received approximately twice the volume of wastewater compared to the water usage by residents based on water meter readings. Under wet weather conditions, the volume of wastewater received at the WWTP is approximately six times the potable water delivered. Flow monitoring identified the areas with the highest inflow to be the City's downtown core and East City that have older pipes and are generally closer to the river.

Key recommendations of this study related to the sanitary sewer system include:

- Sewer System investigation (i.e., flow monitoring, dye testing, smoke testing, CCTV) to identify sources of inflow and infiltration
- Detailed Class EAs for reduction in basement flooding

- Review/Update Development Standards
- Reduce inflow and infiltration (I&I) through disconnecting foundation drains, sealing maintenance hole covers, and installing backflow preventors

5.3.2 Jackson Creek Flood Reduction Master Plan and Diversion Project

In 2010, the City completed the watershed specific Jackson Creek Flood Reduction Master Plan as recommended by the city-wide Flood Reduction Master Plan Study. The study investigated flood and damage potential in the City from Jackson Creek and overall options to reduce it. A diversion sewer to the Otonabee River was determined to be the preferred alternative to mitigate damages from flooding in Jackson Creek for up to the 100-year storm event. To reduce flooding and flood damages from the urban drainage systems, the preferred solution consisted of a combination of upgrading selected storm sewers, adding catch basins and relief sewers, and re-grading areas to contain the major system flows.

The Jackson Creek Diversion Project Environmental Study Report was completed in 2014 to determine a preferred diversion sewer alignment to reduce flood potential in the Peterborough core area. An alignment along Bethune Street was the preferred design selected for its ease of construction and potential for coordination with other projects. With adequate planning, a single large construction contract can construct the Jackson Diversion, the planned replacement of the Bethune Street trunk sanitary sewer, and the implementation of the pedestrian/cycling corridor envisioned in the Central Area Master Plan and Transportation Master Plan.

5.3.3 Detailed Sanitary Sewer EA for the Mitigation and Management of Extraneous Flows into the Sanitary System

As recommended in the Flood Reduction Master Plan, the City completed a detailed sanitary sewer Schedule ‘B’ Class EA in 2012 to review alternatives to reduce I&I. The study recommended focusing I&I reduction efforts in two areas with high flood risk, close to the Otonobee River. For other areas of the City, it was suggested to increase sewer conveyance capacity and add inline storage to better manage peak flows and reduce the risk of potential sewage bypasses to the Otonabee River. It was also recommended to increase the capacity of I&I storage at the Peterborough WWTP.

5.3.4 Stormwater Quality Management Master Plan

The Stormwater Quality Management Master Plan was completed in 2014 to help the City reduce the amount of pollution carried by the municipal storm drainage system to local creeks and the Otonabee River. The study primarily provides recommendations related to the operation, improvement, management, and funding of stormwater infrastructure. Four potential sites for new end of pipe stormwater treatment facilities were identified on City property.

5.4 Transportation Studies

An overview of key transportation studies are included in this section and related studies are referenced. Note that the North End-Trent University Area Transportation and Wastewater Municipal Class Environmental Assessment is included in Section 5.9.3.

5.4.1 City of Peterborough Transportation Master Plan

The City of Peterborough Transportation Master Plan (TMP) was completed in June 2023 and replaced the 2012 Comprehensive Transportation Plan. The TMP was developed to identify solutions in response to population and employment growth the City can expected by the year

2051 and focuses on achieving more sustainable modes of transport. The TMP was coordinated with the County's TMP and adjacent municipalities.

The TMP's Active Transportation strategy primarily consists of enhancing the cycling network based on the City's Cycling Master Plan (2022). Details and maps on the recommended cycling network are included in the TMP. The Transit Improvements strategy primarily consists of increasing service frequency along key corridors and introducing transit priority measures to make transit travel faster and more reliable to ultimately make it more competitive than automobiles. The TMP provides details and maps on the proposed transit and cycling network. The City is also completing a Transit Route Review & Long-Term Growth Strategy as a separate study.

The TMP's implementation strategy is to focus on policy directives that strive to promote sustainable modes of travel, create safer roads for pedestrians, cyclists, and vehicles operations, and improve overall travel flow with enhanced streetscapes.

The TMP's Road Network Improvements strategy focuses on improvements that support growth and improve safety. The approach to growth management is to build upon or improve existing infrastructure, while the safety improvements approach involves intersection operations and turning lanes improvements. The TMP identifies four Special Study Areas that require coordination with other levels of government to complete additional detailed studies to determine the preferred improvements**. Figure 5-1** shows the TMP's recommended road network. Details on the specific road improvements are provided in Section 6.3 of the TMP.

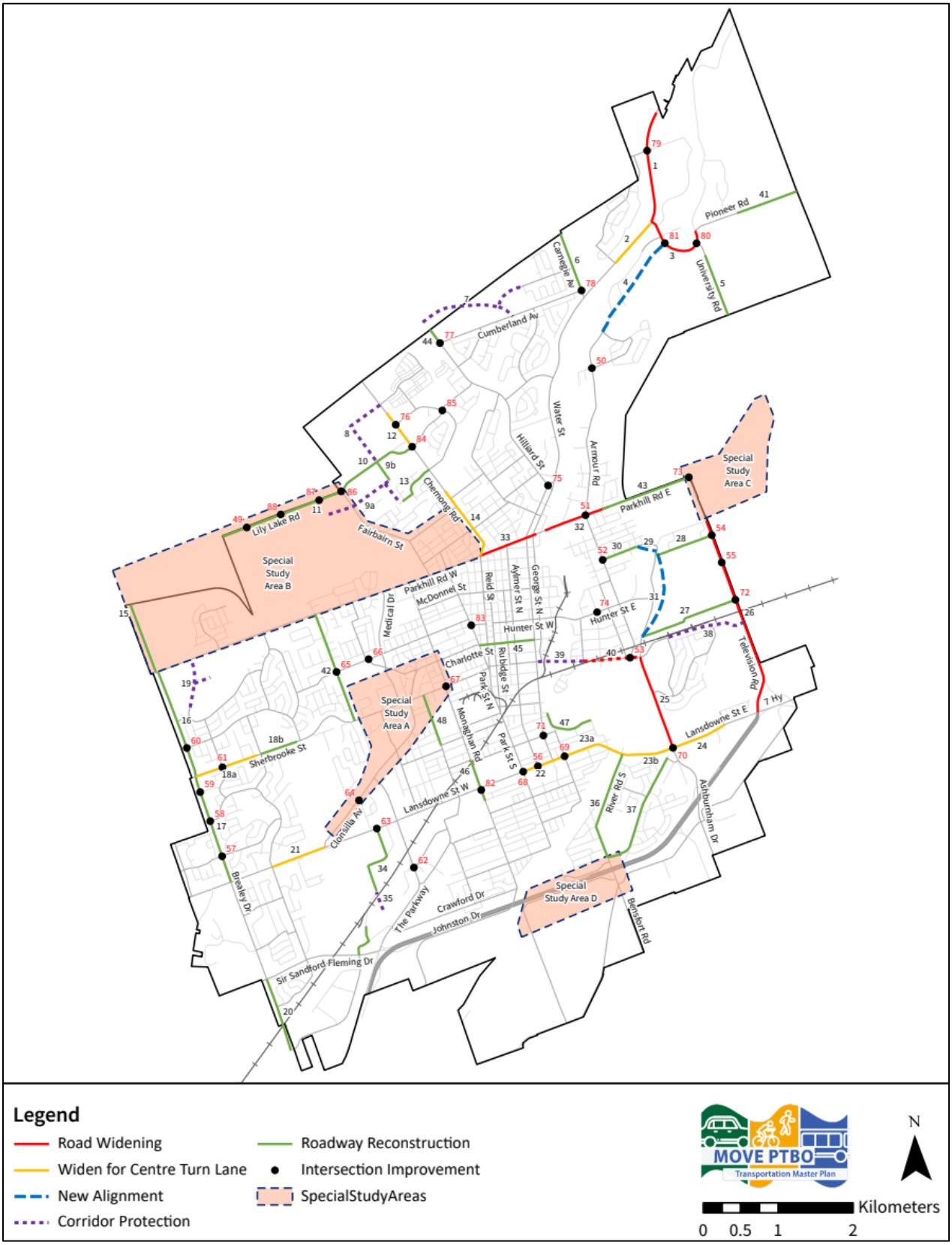


Figure 5-1: Recommended Road Network Improvements to Support Growth by 2051 (TMP, 2023)

5.4.2 Peterborough Eastside Transportation Study

The City completed the Eastside Transportation Study in July 2023 to identify transportation solutions for the area, which is projected have significant growth and lacks sufficient connections across the river and the Trent-Severn Waterway. The eastside area has been identified as Special Study Area in the TMP. The study includes road network, active transportation, and transit strategies, some of which include intersection improvements, road widening, and new waterway crossings. Of note, improvements to County Road 4 to accommodate future demand were identified along with widening of Televison Road, Nassau Mils Road, and improvements to University Road. Since County Road 4 is under the County of Peterborough jurisdiction, implementing proposed solutions will require coordination with the County and local Townships.

5.5 Municipal Cultural Plan

The Municipal Cultural Plan, completed in 2012, is a master plan for use by the City in directing its investment in culture and for identifying municipal priorities. The plan identifies seven strategic directions, some of which include:

- Strengthening the region's waterways, cultural, and natural heritage by protecting the natural environment and historic features, maintaining public access to water, and considering impacts of development and infrastructure
- Strengthening heritage by protecting archeological resources, capitalize on community consultation processes, and asking public to consider cultural aspects of an undertaking.

5.6 Area Studies

5.6.1 Peterborough Airport

The City started the Peterborough Municipal Airport Sanitary Investigation and Pumping Station / Forcemain Upgrades Class EA (Schedule B) in 2016 to study the existing sanitary infrastructure and identify future servicing needs. The study included both the existing sewage pumping station and the forcemain that discharges to the City's sewer system, eventually flowing into the Peterborough WWTP. The current Airport SPS is reaching capacity due to airport expansion; the servicing upgrades are intended to provide for the long-term growth and development at the Airport. The scope of the study was updated to include the investigation of the existing potable water services and identify future water supply requirements and solutions. The City has been assessing options to service the Airport and has identified multiple potential linear infrastructure alignments to connect the existing services at the Airport to existing infrastructure at Fisher Drive.

The Peterborough Airport Master Plan completed in 2022 identifies airport servicing costs related to the airport pumphouse generator replacement, water and sewer upgrades, fire regulation requirements and water pumping station upgrades account for a significant proportion of capital funding requirements in the short term, estimated at almost $22 million.

5.6.2 Little Lake Area

The Little Lake and Area Master Plan was completed in 2010 for public and private lands surrounding the Otonabee River and Little Lake in the City. Little Lake is a distinctive resource in the heart of the City's urban area, is adjacent to the downtown core, and is an important node on the Trent-Severn Waterway. The 20-year plan has a vision to set a new standard for environmental stewardship and focuses on enhancing trails and natural spaces, consolidating cultural facilities, restoration of facilities and play spaces. The plan contains mapping that identifies opportunities for

shorelines, habitat, vegetation, and anchored wetlands restoration as well as stormwater outfall bioswale opportunities.

5.6.3 North End / Trent University

The City of Peterborough North End – Trent University Area Municipal Class EA is an ongoing Schedule 'C' study, which will address various transportation and wastewater upgrades and improvements, which includes evaluating alternative solutions for:

- Realignment of Armour Road, north of Cunningham Boulevard;
- Reconstruction or realignment of the Nassau Mills Road bridges over the Otonabee River and Trent-Severn Waterway;
- Development of short-term and long-term solutions to address emerging traffic congestion along Nassau Mills Road and Water Street;
- Development of a stormwater management plan and a sanitary sewage servicing plan;
- Improvements to University Road within the City of Peterborough

A preliminary review of the natural environment existing conditions identified natural heritage features including the Nassau Provincially Significant Wetland Complex, areas of natural and scientific interest, significant woodlands, unevaluated wetlands, and Significant Wildlife Habitat. Two SAR species were identified. No aquatic habitat conditions of concern or aquatic SAR were identified.

During this study, new information related to the sanitary system was compiled. The City's SMP being completed under this assignment will identify growth components related to the North End – Trent University Area, which will identify sanitary needs that will then be inputted into this Class EA.

5.6.4 Coldsprings Development Area

The Coldsprings development area is located in the southern limit of the City, south of Highway 7 and east of the Otonabee River. The area is approximately 280 hectares in size, consisting of primarily agricultural land use and single family residences. These lands were annexed from Otonabee-South Monaghan in 1998 and were amalgamated with the City of Peterborough in 2008.

A Functional Planning Study for the Coldsprings Planning Area was completed in 2010 to provide a comprehensive review and analysis of the major planning issues. The study's recommended land use distribution identified 202 of the 280 hectares as developable for residential purposes. Additional environmental and archeological investigations were recommended. Associated background studies included a 2004 hydrogeological and geotechnical assessment, a 2005 natural environment report, and 2009 drainage and storm water management report.

The Functional Servicing Report completed in 2010 concluded the following in regard to the sanitary system:

- Two new pumping stations and a separate sanitary forcemain will be required to convey flows to the WWTP.
- A forcemain alignment connecting to the Southpark Drive sewer is the preferred route; however, the sewer has insufficient capacity and requires replacement.
- A WWTP capacity increase to 68,000 m^3/day is required (this increase in capacity has since been achieved through rerating)

The City's Official Plan (OP) states lands within the Coldsprings Special Study Area are anticipated to accommodate growth to 2051. The City will complete a secondary plan for the area. The City's OP policies of the Rural Transitional Area Designation shall apply to the Coldsprings Special Study area until the secondary plan is completed and the OP is amended.

5.6.5 Jackson Creek Special Policy Area

The Jackson Creek Special Policy Area is an overlay designation in the City's OP for lands within the downtown area that are susceptible to flooding under the regulatory flood (i.e., greater of the Timmins Storm and 100-year flood events). Permitted land uses within the special policy area shall be in accordance with OP designations for the Central Area. The area is subject to development policies, some of which include:

- Flood proofing building to the regulatory flood where practical,
- Storing chemicals which can pose an unacceptable threat to public safety during potential flooding above the regulatory flood
- Requirement to flood proof and maintain land uses associated with emergency services (e.g., fire, police and ambulance stations and electrical substations) during a regulatory flood level.

5.6.6 Planning Area-Specific Development Charges Background Study

The 2022 Planning Area-Specific Development Charges Background Study identifies the development-related capital costs that are attributable to the development that is forecast to occur in the City to build-out of eight planning areas. The planning/growth areas include Jackson, Carnegie East, Carnegie West, Chemong East, Chemong West, Liftlock, Coldsprings, and Lily Lake.

5.6.7 Township of Cavan Monaghan Water and Wastewater Master Servicing Study

A draft Water and Wastewater Master Servicing Study Class EA report was completed in November 2023 for the Township of Cavan Monaghan. The study considered a 30-year planning horizon to the year 2051 and identified preferred alternatives for master servicing. The preferred wastewater treatment servicing alternative is to expand the existing Millbrook WWTP. The preferred wastewater collection and conveyance servicing alternative for the north catchment was to construct a new SPS and convey wastewater to the east sewer shed. The preferred collection and conveyance servicing alternative for the south catchment is upgrading the existing Tupper St. SPS to increase capacity.

5.7 Forcemain Condition Assessments

Condition assessment of five forcemains was completed from 2020 to 2021, which include Burnham Point, Engleburn, Parkhill Street E, Valleyview Drive, Simcoe Street. Condition assessment of one gravity sewer on Park Street was also completed.

The assessment included leak detection, transient pressure monitoring (where applicable) and AWWA design check. The condition assessment reports found all but Simcoe forcemain linear assets to be in good condition. Replacement of the Simcoe forcemain is recommended in the near to medium future. The Park Street gravity sewer was determined to be adequately designed under 24 feet of earth cover but it is overloaded once concrete spalling starts to occurs and rebars started corroding, which would then result in a high risk of failure. The Park Street sewer was otherwise found to be in overall good condition.

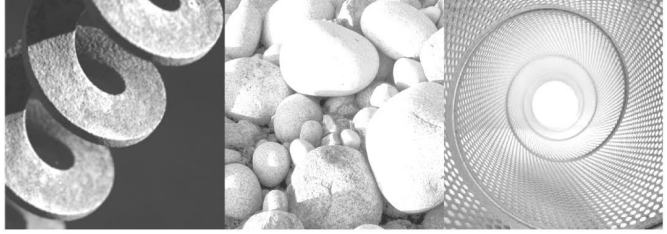
6 Gap Analysis and Next Steps

Through review of the study area, past studies, and the existing sanitary system, the following gaps in information were identified that require further review:

1. Recalibrate the hydraulic model to incorporate more representative flow monitor data (completed in December 2023).

2. Incorporate Indigenous knowledge in assessment of existing natural environment, cultural heritage and archaeological constraints.

Next steps that are currently underway and will be summarized in TM 2 are the review of the existing sanitary system, and identification of constraints and risk.



GEI Consultants

peterborough

City of Peterborough Sanitary Master Plan

VOLUME 2*:* APPENDIX A1

Natural Heritage Background Review Report

Prepared by:
GEI Consultants Canada

April 2025

The City of Peterborough is committed to ensuring that all City services, programs, and facilities are inclusive and accessible. Please contact the Project Team if you need any accommodations to provide comments and/or feedback for this Study.

March 28, 2025

City of Peterborough
City Hall
500 George Street North
Peterborough, ON K9H 3R9

RE: City of Peterborough Sanitary Master Plan: Desktop Natural Heritage Review

1. INTRODUCTION

GEI Consultants Canada Ltd. (GEI) is working on behalf of the City of Peterborough, to conduct a desktop natural heritage review and high-level constraints analysis as part of larger background review for the development of the City of Peterborough's Sanitary Master Plan. This Sanitary Master Plan (SMP) is intended to guide improvements to the entire sanitary system in the City of Peterborough and align with capacity requirements outlined in the City of Peterborough's Official Plan (2023).

The Sanitary Master Plan area (henceforth referred to as the Study Area), encompasses the City of Peterborough, the Peterborough Airport, and the Peterborough Landfill, in Ontario **(Appendix A, Figure 1)**. This technical memorandum provides a detailed background information review of relevant natural heritage policies, identifies natural heritage features, and highlights plant and wildlife records within and adjacent to the Study Area. The intent is for this background review is to support the identification of sensitive environmental features located within the study area to inform strategies and servicing opportunities within the SMP. Future assessments will be required to identify potential impacts posed by the proposed SMP to the natural environment and subsequent mitigation measures.

2. TRADITIONAL LANDS AND TREATY RIGHTS

The Study Area contains lands that are subject to Rice Lake Treaty No. 20 (1818) and the Williams Treaties in 1923; collectively known as the Williams Treaties First Nation and includes the traditional territory of Alderville, Beausoleil, Curve Lake, Georgina Island, Hiawatha, Rama and Scugog Island First Nations. As per Section 35 of the *Constitution Act* (1982), Peoples with Treaty Rights must be consulted and accommodated prior to conducting any activities that could impact the rights or interests of Indigenous Peoples on the territory. To accommodate Section 35 rights and develop a more fulsome constraints analysis, this report will seek to highlight opportunities moving forward to develop a more comprehensive understanding of Traditional Ecological Knowledge to inform natural heritage characterization in the Study Area. This will be accomplished through meaningful consultations with the

Williams Treaty First Nations which ensures that natural heritage assessments and constraints analyses are considerate and inclusive of the rights and interests of these Nations.

At this time, traditional knowledge has not been incorporated and as such, the content provided in this technical memorandum has been prepared strictly using Western science and therefore is not considered a complete review of natural heritage features and/or constraints.

3. NATURAL HERITAGE PLANNING CONSIDERATIONS

The Study Area is subject to federal, provincial, and municipal legislation, land use policies established by the City of Peterborough and the County of Peterborough and is located within the Otonabee Region Conservation Authority (ORCA) jurisdiction and is subject to their regulations.

Natural heritage features should be identified early in the Sanitary Master Planning process to help align project outcomes with legislation and policy to avoid the disruption of significant natural heritage features. When avoidance is not possible, then the SMP should seek out opportunities to minimize and mitigate adverse impacts. To help characterize the Study Area, the following legislation and policies were reviewed in the context of the quality and extent of natural heritage features found on, and within 120 m of the Study Area. This review is intended to identify key considerations for natural heritage features related to planning for infrastructure servicing in the Study Area.

Relevant Federal Legislation:

- *Department of Transport Act* (1985)
  - Historic Canals Regulations (SOR/93-220)
  - *Rideau Canal and Trent-Severn Waterway National Historic Sites of Canada Policies for In-Water and Shoreline Works and Related Activities* (Parks Canada, 2007)
- *Species at Risk Act* (2002)
- *Migratory Birds Convention Act* (1994)
  - Migratory Birds Regulations (2022)
- *Fisheries Act* (1985)

Relevant Provincial Legislation:

- *Planning Act* (1990)
  - *Provincial Planning Statement* (2024)
- *Endangered Species Act* (2007)

- *Conservation Authorities Act* (1990)
    - *Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits*
    - *DRAFT Watershed Planning & Procedures Manual* (Otonabee Region Conservation Authority, 2025)

Relevant Municipal Legislation:

- *City of Peterborough Official Plan* (2023)
- *County of Peterborough Official Plan* (1994, Consolidated 2022)
- *County Official Plan* (Peterborough County, 2022; Not yet approved by MMAH)
- *Township of Otonabee-South Monaghan Official Plan* (2013, Consolidated 2017)
- *Official Plan for the Township of Cavan Monaghan* (2015, Amended 2021)

3.1 Relevant Federal Legislation

While there are no federally regulated lands within the Study Area, the Parks Canada Agency "has ownership and jurisdiction over the bed of the Trent-Severn Waterway and its lakes and rivers to the original upper controlled water elevation" (Parks Canada Agency, 2024).

Other federal legislation, as described below, may also apply in specific situations within provincially regulated lands.

Department of Transport Act (1985)

The *Department of Transport Act* (1985) and *Historic Canals Regulations* (SOR/93-220), administered by the Parks Canada Agency, applies to "the bed of the Trent-Severn Waterway and its lakes and rivers to the original upper controlled water elevation" (Parks Canada Agency, 2024). Any in-water, shoreline works, or related activities are subject to the *Rideau Canal and Trent-Severn Waterway National Historic Sites of Canada Policies for In-Water and Shoreline Works and Related Activities* (Parks Canada, 2007).

Species at Risk Act (2002)

The *Species at Risk Act* (SARA; 2002) applies principally on federally regulated lands, however there are general prohibitions in the SARA against killing an individual of a protected aquatic or migratory bird species, or destroying their residence, which apply to all lands, and with respect to critical habitat for aquatic Species at Risk identified in Schedule 1 of SARA. SARA is administered by Fisheries and Oceans Canada for aquatic species. Where Species at Risk are listed on Schedule 1 of the Federal SARA and are also listed on the Species at Risk in Ontario (SARO) List as Threatened or Endangered, they are offered provincial protection under the *Endangered Species Act* – which is described later in this section.

While there are no federally regulated lands within the Study Area, it should be noted that federal orders can be issued on non-federally owned land under SARA, if statutory conditions are met. These conditions are detailed in Section 80 of the SARA and must be directly related to concerns of imminent threats to survival or recovery of a species.

Fisheries Act (2019)

Fisheries and Oceans Canada (DFO) administers the *Fisheries Act* (1985) which prohibits the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat. There are several watercourses and waterbodies within the Study Area (discussed further in **Section 3.0**) that will merit consideration should they be impacted by strategies or siting proposed by the SMP.

Where projects have the potential to impact fish or fish habitat, a "Request for Review" must be submitted to the DFO. This process allows the DFO to review the project to determine whether there is potential to impact an aquatic species at risk, cause the death of fish, or result in harmful alteration, disruption, or destruction of fish habitat (HADD). It should be noted that any proposed infrastructure activities that may disturb the instream or riparian area should be assessed comprehensively to identify potential impacts to fish communities in impacted watercourses and identify ways to ensure the intent of the *Fisheries Act* is upheld.

Migratory Birds Convention Act (1994)

Environment and Climate Change Canada (ECCC) administers the *Migratory Birds Convention Act* (MBCA; 1994) and the *Migratory Birds Regulation* (MBR; 2022), which protects the nests of migratory birds from destruction, including incidental take (i.e. the unintentional destruction of a nest), as well as from disturbance. Currently, 700 migratory bird species are protected under this Act, including songbirds, woodland birds, waterfowl, shorebirds, and seabirds. Appropriate timing constraints on potentially disruptive activities such as vegetation clearing (e.g., tree removal) where migratory birds may be nesting are required to avoid contravention of this Act.

It should be noted that this desktop review does not include migratory bird habitat assessment; instead, this policy has been reviewed to flag that further investigations may be required to assess potential SMP project sites for migratory bird habitat. Should there be evidence of migratory birds, it will be important to ensure preventative and mitigative measures are taken to ensure that works do not contravene this Act and that migratory bird species and their nests are protected.

3.2 Relevant Provincial Legislation

Provincial Planning Statement (2024)

The Province of Ontario has released the *Provincial Planning Statement* (PPS; MMAH, 2024) under the *Planning Act* (1990); which came into effect on October 20, 2024. This document replaces the previous

Provincial Policy Statement (2020) and *A Place to Grow: Growth Plan for the Greater Golden Horseshoe* (2020). Many of the Natural Heritage considerations remain the same. In general, the PPS provides direction on matters of provincial interest related to land use planning and development. It "…supports a comprehensive, integrated and long-term approach to planning…" The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together.

This technical memorandum addresses those policies within the PPS (2024) that are specific to Natural Heritage (Section 4) with some reference to other policies with relevance to the Sanitary Master Plan process and the development of infrastructure (Section 3) including water and wastewater servicing, stormwater management (SWM), and the importance of indigenous consultation (Section 1).

Infrastructure Planning:

Section 3.0 of the PPS provides planning guidance for Infrastructure and Public Service Facilities, Land Use Compatibility, as well as Sewage, Water, and Stormwater.

"Section 3.1: General Policies for Infrastructure and Public Service Facilities

1. *Infrastructure and public service facilities shall be provided in an efficient manner while accommodating projected needs. Planning for infrastructure and public service facilities shall be coordinated and integrated with land use planning and growth management so that they:*
    a) *are financially viable over their life cycle, which may be demonstrated through asset management planning;*
    b) *leverage the capacity of development proponents, where appropriate; and*
    c) *are available to meet current and projected needs.*
2. *Before consideration is given to developing new infrastructure and public service facilities:*
    a) *the use of existing infrastructure and public service facilities should be optimized; and*
    b) *opportunities for adaptive re-use should be considered, wherever feasible."*

Where infrastructure means the physical structures (facilities and corridors) that make up sewage and water systems, septage treatment systems, stormwater management, and others as defined in the PPS.

"Section 3.5: Land Use Compatibility

1. *Major facilities and sensitive land uses shall be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of major facilities in accordance with provincial guidelines, standards and procedures."*

Where *Major facilities* mean all facilities that require separation from sensitive land uses, including but not limited to sewage treatment facilities.

"*Section 3.6: Sewage, Water and Stormwater*

1. *Planning for sewage and water services shall:*
    a) *accommodate forecasted growth in a timely manner that promotes the efficient use and optimization of existing municipal sewage services and municipal water services and existing private communal sewage services and private communal water services;*
    b) *ensure that these services are provided in a manner that:*
        1. *can be sustained by the water resources upon which such services rely;*
        2. *is feasible and financially viable over their life cycle;*
        3. *protects human health and safety, and the natural environment, including the quality and quantity of water; and*
        4. *aligns with comprehensive municipal planning for these services, where applicable.*
    c) *promote water and energy conservation and efficiency;*
    d) *integrate servicing and land use considerations at all stages of the planning process;*
    e) *consider opportunities to allocate, and re-allocate if necessary, the unused system capacity of municipal water services and municipal sewage services to support efficient use of these services to meet current and projected needs for increased housing supply…"*

and

2. *Municipal sewage services and municipal water services are the preferred form of servicing for settlement areas to support protection of the environment and minimize potential risks to human health and safety..."*

Natural Heritage:

Section 4.1 of the PPS outlines provincial policies related to natural heritage. Eight types of significant natural heritage features are defined in the PPS, as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat (SWH);

- Fish habitat;
- Habitat of endangered and threatened species; and
- Significant Areas of Natural and Scientific Interest (ANSIs).

The PPS indicates the following as it relates to natural heritage goals for the province:

"*Section 4.1: Natural Heritage*

1. *Natural features and areas shall be protected for the long term.*
2. *The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.*
3. *Natural heritage systems shall be identified in Ecoregions 6E & 7E1, recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas."*

Indigenous Consultation:

Section 1 of the PPS outlines the importance of Indigenous consultation in land use planning decisions:

"The Province's rich cultural diversity is one of its distinctive and defining features. Indigenous communities have a unique relationship with the land and its resources, which continues to shape the history and economy of the Province today."

and

"Ontario will continue to recognize the unique role Indigenous communities have in land use planning and development, and the contribution of Indigenous communities' perspectives and traditional knowledge to land use planning decisions. Meaningful early engagement and constructive, cooperative relationship-building between planning authorities and Indigenous communities will facilitate knowledge-sharing and inform decision-making in land use planning."

and

"The Province recognizes the importance of consulting with Aboriginal communities on planning matters that may affect their section 35 Aboriginal or treaty rights."

Ontario Endangered Species Act (2007)

The *Endangered Species Act* (ESA; 2007) was developed to:

- identify Species at Risk (SAR), based upon best available science;
- protect SAR and their habitats and to promote the recovery of the SAR; and
- promote stewardship activities that would support those protection and recovery efforts.

The ESA protects all Threatened, Endangered and extirpated species listed on the Species at Risk in Ontario (SARO) list (Government of Ontario 2007b). These species are legally protected from harm or harassment, and their associated habitats are legally protected from damage or destruction, as defined under the ESA.

It should be noted that for the purposes of this report, SAR will be considered those species designated as either Endangered or Threatened on the SARO list. Habitats for species with a designation of Special Concern on the SARO list are treated as a Species of Conservation Concern (SOCC) and are protected under the PPS as a type of Significant Wildlife Habitat (SWH).

Additionally, this desktop review does not include an analysis of habitat for threatened or endangered species or SWH. While **Section 3.0** of this report reviews records of species inside and within 120 m of the Study Area, site specific field surveys are recommended to accurately delineate significant habitat features.

Conservation Authorities Act (1990)

Otonabee Region Conservation Authority (ORCA) is responsible for administering Ontario Regulation 41/24: *Prohibited Activities, Exemptions and Permits* (O. Reg. 41/24). This regulation allows Conservation Authorities to implement Section 28 of the *Conservation Authorities Act*, *1990* (amended 2024).

Section 28(1) of this Act states that: *"No person shall carry on the following activities, or permit another person to carry on the following activities, in the area of jurisdiction of an authority:*

1. *Activities to straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or to change or interfere in any way with a wetland.*
2. *Development activities in areas that are within the authority's area of jurisdiction and are,*
    - *i. hazardous lands,*
    - *ii. wetlands,*
    - *iii. river or stream valleys the limits of which shall be determined in accordance with the regulations,*
    - *iv. areas that are adjacent or close to the shoreline of the Great Lakes-St. Lawrence River System or to an inland lake and that may be affected by flooding, erosion or dynamic*

beach hazards, such areas to be further determined or specified in accordance with the regulations, or

v. *other areas in which development should be prohibited or regulated, as may be determined by the regulations."*

Pursuant to O. Reg. 41/24, any interference with or development in or on areas stated in the *Conservation Authorities Act* requires permission from the Conservation Authority. The Conservation Authority may issue permits under Section 28.1 of the Act and may attach conditions on the permits per Section 9(1) of the Regulation.

ORCA also provides technical guidance through their *Environmental Impact Study (EIS) Terms of Reference & Submission Standards* (ORCA, 2015) and their *Watershed Planning & Regulations Policy Manual* (ORCA, 2012). To maintain consistency with the new O. Reg. 41/24, ORCA has recently prepared a *DRAFT Watershed Planning & Procedures Manual* (ORCA, 2025), which is currently undergoing its 30-day comment period for review. This updated manual aims to consolidate all of ORCA's watershed planning and regulatory policies and to provide direction, clarity, and transparency on how ORCA administers O. Reg. 41/24.

3.3 Municipal Legislation

While the Study Area is mostly located within the single tier municipality of the City of Peterborough (the City) and subject to the City of Peterborough Official Plan (2023), portions of the study area, including the Peterborough Landfill site and the Peterborough Airport site, are located outside of the City (as seen in **Table 1**).

The Peterborough Waste Management Facility site is located within the upper tier municipality of the County of Peterborough and the lower tier municipality of the Township of Otonabee-South Monaghan. As such, the Peterborough Landfill site is subject to both the *County of Peterborough Official Plan* (1994, amended 2022) and the *Township of Otonabee-South Monaghan Official Plan* (2003, consolidated 2017).

The Peterborough Airport site is located within the upper tier municipality of the County of Peterborough. The western portion is located within the lower tier municipality of the Township of Cavan Monaghan, and the eastern portion is located within the Township of Otonabee-South Monaghan. As such, portions of the Peterborough Airport site are subject the *County of Peterborough Official Plan* (1994, amended 2022), and either the *Township of Otonabee-South Monaghan Official Plan* (2003, consolidated 2017) or the *Official Plan for the Township of Cavan Monaghan* (2015, amended 2021).

These additional Official Plans have been reviewed for provisions related to public infrastructure planning and natural heritage priorities.

Table 1. Municipalities located within the Study Area

Study Area	Sub-Study Area	Single Tier Municipality	Upper Tier Municipality	Lower Tier Municipality
Study Area	City of Peterborough	City of Peterborough		
	Peterborough Landfill Site (all)		County of Peterborough	Township of Otonabee-South Monaghan
	Peterborough Airport Site (western lands)		County of Peterborough	Township of Cavan Monaghan, and the
	Peterborough Airport Site (eastern lands)			Township of Otonabee-South Monaghan

City of Peterborough Official Plan (2023)

The *City of Peterborough Official Plan* was adopted by Council on November 29, 2021, and approved by the Minister of Municipal Affairs and Housing on April 11, 2023. It has been recently amended as of June 5, 2024, and includes updates from Bill 150 and Bill 162. The Official Plan is designed to be a guiding document to provide direction on the management of communities, land-use changes and development practices. It provides for a planning outlook to the year 2051. The guiding principles reflected in the plan include development of communities that are: complete, reflect environmental stewardship and sustainability, vibrant and unique, well-connected with options for mobility, and maintain a strong and diverse economy.

Infrastructure:

Policies for the planning, provision, and priorities of municipal infrastructure are included within Section 6.0 of the plan. Where indicated, these policies are supported through the development of Master Plans, including this SMP. The objectives of these infrastructure policies are to: provide services in an efficient and cost-effective manner, ensure efficient use of existing municipal services, and ensure sufficient system capacity.

According to Section 6.1.2.f:

"Public utilities, including sanitary sewage infrastructure, storm sewer systems, municipal water, hydro, gas, telecommunication infrastructure, or any other utilities shall be permitted within any land use designation of this Plan. The location of public utilities should avoid lands designated Natural Areas. Where the construction of any municipal infrastructure project is proposed within the lands designated Natural Areas or on lands within 120 metres of natural heritage features, the project shall be required to submit an ***Environmental Impact Study****, and/or other appropriate studies, in accordance with the policies in this Plan."*

And Section 6.1.2.i:

"The extension of municipal sewer and water services shall be planned, designed and constructed in accordance with a comprehensive water or wastewater master plan or equivalent, informed by watershed planning, which:

i. Demonstrates that the effluent discharges and water takings associated with the system will not negatively impact the quality and quantity of water;
ii. Identifies the preferred option for servicing growth and development in accordance with the policies of this Plan, which must not exceed the assimilative capacity of the effluent receivers and sustainable water supply for servicing, ecological and other needs; iii. Identifies the full life cycle costs of the system and develops options to pay for these costs over the long term; and,
iii. Includes a servicing strategy for those lands which are designated for development in this Plan, but which are currently beyond the extent of municipal services."

Also, *Section 6.1.7:* Extension Beyond City Limits:

a. "Municipal utility services, sanitary sewer and water supply shall not be extended beyond the City boundaries, except in the case where such infrastructure is to serve City owned facilities such as the Peterborough Airport.
b. Notwithstanding any other policy of this Plan, if it is demonstrated that a mutually beneficial development opportunity exists to support the economic development of both the City and a neighbouring municipality, the City may consider the extension of services beyond the City boundary by amendment to this Plan…"

Indigenous Consultation:

Policies surrounding the duty to consult indigenous peoples of Canada are included within Section 7.1 of the plan. These policies highlight the City of Peterborough's goals and objectives for the appropriate, adequate, and timely consultation of indigenous people of Canada.

According to Section 7.1.b:

"*In the spirit of reconciliation, in acknowledging the "free, prior and informed consent" as set out in the United Nations Declaration on the Rights of Indigenous Peoples as applied and interpreted by Courts of competent jurisdiction, and the right to carry out traditional pursuits in a respectful and unrestricted manner, Peterborough will continue its work on building a new relationship with Treaty 20 First Nations. "Free, prior and informed consent" involves consulting with Treaty 20 First Nations prior to development and gaining consent before moving forward, where appropriate."*

Section 7.1.c:

"…The City will engage and partner as appropriate with Indigenous Communities when considering planning matters that may affect their rights. Collaboration with the First Nations of Curve Lake, Hiawatha and Scugog Island will be the priority, with continued cooperation and communication with the Nogojiwanong Friendship Centre."

Section 7.1.e:

"Under this Plan, Peterborough will continue efforts to engage with local and regional Indigenous Communities on protocols for land use and development approvals. This approach will balance the growth and development requirements of the Provincial Policy Statement while acknowledging the traditional knowledge and cultural heritage of the Treaty 20 First Nations and other Indigenous Communities."

And Section 7.1.f:

"…Involvement and engagement with Indigenous Communities will occur as early as reasonably possible on future planning proposals."

Natural Heritage

Natural Heritage policies are included within Section 4.6 of the Official Plan, and a complementary document titled *The Natural Heritage System Background Study* is included within Appendix I. The intent of the natural heritage policies and Natural Areas Designation within the Official Plan is to: protect the health and water quality of the Otonabee River Watershed, conserve biodiversity, protect natural heritage features and their associated ecological functions, and protect surface and underground water resources.

The Natural Heritage System (NHS) is made up of Natural Heritage Features and Areas (NHFA; used interchangeably within the Plan), Vegetation Protection Zones (VPZs), and the Linkages between NHFA. Natural Heritage Features and Areas include: wetlands, woodlands, valleylands, ANSIs, watercourses, waterbodies, habitat of threatened or endangered species, and significant wildlife habitat (provincial and local scale).

A graduated approach for the protection of NHFA is outlined below, including the designation of Level A, B, and C features within the Plan, where Level A features are afforded the highest level of protections.

*Section 4.6.2.b.*i and Section 4.6.2.c:

"i. Level A features are afforded the highest level of protection and the intent is to protect the form and function of these areas in situ..."

Where Level A features include:

- Provincially Significant Wetlands
- Significant Woodlands
- Significant Valleylands
- Provincially or Regionally Significant Life Science or Earth Science Areas of Natural and Scientific Interest
- Permanent and Intermittent Watercourses (including Little Lake)
- Habitat for Threatened or Endangered Species
- Significant Wildlife Habitat

Section 4.6.2.b.ii and Section 4.6.2.d:

"ii. Level B features are important to the overall function of the Natural Heritage System. The intent is to preserve the function that these areas provide to the Natural Heritage System while allowing some flexibility in the protection of the feature in cases where it can be demonstrated that a net gain in function can be achieved through mitigation or a compensation strategy."

Where Level B features include:

- Non-Provincially Significant Wetlands or Unevaluated Wetlands greater than 0.5 hectares or 0.2 hectares to 0.5 hectares that meet one or more of the following:
  - Located within a floodplain;
  - Contiguous with a permanent or intermittent watercourse, a Significant Valleyland or Level A or Level B woodland;
  - Identified as a fen or a bog; or,
  - Identified as part of a Proximity Linkage or Regional Connection.
- Non-Significant Woodlands greater than or equal to 0.2 hectares
- Non-Significant Valleylands
- Locally Significant Life Science or Earth Science Areas of Natural and Scientific Interest
- Naturally Occurring Waterbodies
- Wildlife Habitat within semi-natural features

As well as Section 4.6.2.b.iii and Section 4.6.2.e:

"iii. Level C features are recognized for the supporting role they provide to the Natural Heritage System. Development and site alteration will be considered where there is an opportunity to replicate the function on site or elsewhere in the City..."

Where Level C features include:

- All wetlands that do not otherwise qualify under Natural Heritage System Level A or Level B; and,
- Ephemeral watercourses.

Regional Connections (Section 4.6.2.f) provide connectivity between the City's NHS and the County's NHS. Connectivity and function of Regional Connections should be maintained, and where possible enhanced.

Proximity Linkages (Section 4.6.2.g) provide connectivity between Level A features and Level B features, where they are located < 60 m from one another. These Proximity Linkages are to be treated as Level B features.

Minimum Vegetation Protection Zones (VPZs) have been established in Section 4.6.2.n and Table A of the plan. VPZs should be determined by a site-specific Environmental Impact Study, where development or site alternation is proposed within 120 m of a Level A/B/C NHFA.

Natural heritage policies, specific to municipal infrastructure projects are described in Section 4.6.2.l. *"… the extension of existing municipal infrastructure projects where the alignments or locations of those facilities have been established in this Plan… and/or approved Environmental Assessments, may be permitted within lands designated as Natural Areas, including the vegetation protection zone for a natural heritage feature, subject to the application of specific mitigation measures as set out in an approved Environmental Impact Study and provided they are in conformity with Federal and Provincial requirements."*

County of Peterborough Official Plan (1994, Amended 2022)

As per Ontario Bill 23 – More Homes Built Faster Act (2022) and Ontario Bill 185 – Cutting Red Tape to Build More Homes Act (2024), some upper tier municipalities were designated as an "upper-tier municipality without planning responsibilities". This list does not include the County of Peterborough (the County) and therefore the County retains their planning responsibilities.

Both the Peterborough Landfill Site and the Peterborough Airport Site are located within the County of Peterborough and subject to the policies outlined in the *County of Peterborough Official Plan* (1994, Amended 2022). The County of Peterborough has recently undergone Official Plan updates, including the preparation of the *County Official Plan,* which was adopted by Council in 2022, but is still awaiting

approval from the Minister of MMAH. Until such time, the 1994 *County of Peterborough Official Plan* remains in force.

Natural heritage goals and objectives are outlined in Section 4.1 of the plan, with the ultimate goal to "protect and enhance natural features and ecological systems, conserve natural resources, reduce pollution, and protect people and property from environmental hazards". Sections 6.2.15 and 6.2.16 provide additional policies with respect to areas designated as 'Environmental Constraint' and 'Provincially Significant Wetlands'. Within these two areas, the creation or maintenance of infrastructure authorized under an environmental assessment is not restricted.

Within Section 4.1.3.4 of the plan, Natural Heritage Features and the natural connections between them should be maintained, restored, or where possible improved. NHF's include:

- Significant wetlands;
- Significant portions of the habitat of endangered and threatened species;
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat;
- Significant areas of natural and scientific interest;
- Fish habitat; and
- Lands adjacent to the above noted features.

County of Peterborough Official Plan (2022, not yet in force)

As mentioned above, the *County of Peterborough Official Plan* was adopted by Council in 2022 but has not yet been approved by the Minister of MMAH. The proposed 2022 plan includes significant changes to the Natural Heritage System mapping and policies in order to bring the County into compliance with provincial priorities.

Natural Heritage:

Within Section 6.3 of the *County of Peterborough Official Plan* (2022), Natural Heritage Features includes the following features which are important for their environmental and social values:

- significant wetlands;
- fish habitat;
- significant woodlands;

- habitat of endangered species and threatened species;
- significant wildlife habitat;
- significant valleylands; and
- significant areas of natural and scientific interest.

Natural Heritage Evaluations are required for development within 120 m of key natural heritage features and/or key hydrologic features, although development (as defined under this plan), does not include activities that create or maintain infrastructure authorized under an Environmental Assessment.

Infrastructure:

Section 10.3.3 defines planning priorities related to water and sanitary servicing, where *"Planning for sewage and water services shall promote efficient use and optimization of existing water and sewage infrastructure. These systems should be provided in a manner that can be sustained by the water resources upon which such services rely, prepares for the impacts of changing climate, is feasible and financially viable over their lifecycle and protects human health and safety and the natural environment."*

And Section 10.3.3.6), where "*Municipalities are encouraged to prepare comprehensive master servicing plans for the planning, expansion and on-going operation of sewage treatment and water treatment facilities, pumping stations, force mains and trunk distribution and collection systems."*

Township of Otonabee-South Monaghan Official Plan (2003)

The *Township of Otonabee-South Monaghan Official Plan* was prepared in 2003 and covers a 20-year planning period to the year 2023. It outlines objectives for the environment, use and management of natural resources, preservation of agricultural and rural communities, economic development, provision of culture, recreation and community social needs, tourism, transportation, public utilities and infrastructure, and community improvement.

Natural heritage and natural hazards are defined and described in Section 3.7, with policies for development being located within both Section 3.7 and Section 5.11 of the plan. These lands are generally designated as Environmental Protection and shown in Schedule A of the Official Plan.

Servicing, including water and wastewater, is described within Section 3.2 Water Supply and Wastewater Servicing, where the Township

Once approved by the Minister of Municipal Affairs and Housing, the *County Official Plan* (Peterborough County, 2022) will replace the *Township of Otonabee-South Monaghan Official Plan* (2003).

Township of Cavan Monaghan Official Plan (2015)

The *Official Plan for the Township of Cavan Monaghan* (2015) was approved by the County of Peterborough in 2013 and the Ontario Municipal Board in 2015, and has been amended recently, in 2021. The goals of the plan are to build a sense of community in the Township, preserve the rural character, protect and preserve the natural environment, improve the economy, ensure development is attractive, accessible, and reflects the historic character of the Township, and manage change in a manner that has the greatest positive impact on the Township.

Natural Heritage and Resource Management strategies are described in Section 2.2, with general policies in Section 3.8. Specific policies surrounding the Natural Heritage System are located in Section 6, with the lands that are generally designated as part of the Natural Heritage System shown in Schedule A of the Official Plan.

Section 6.2.e outlines that all infrastructure subject to and approved under the *Environmental Assessment Act*, the *Planning Act*, or others are permitted within the NHS where it serves the significant growth and economic development expected in Southern Ontario. Infrastructure strategies are found in Section 2.1.4, with additional policies found in Section 7.8 of the plan.

4. NATURAL HERITAGE EXISTING CONDITIONS

The City of Peterborough, the Peterborough Airport, and the Peterborough Landfill, (the Study Area) are located within Ecoregion 6E. A comprehensive background review was completed by GEI in 2023 as part of the Draft Report submission. The following resources were reviewed in 2023 for information relating to natural features and species that may be found on the Study Area:

- Land Information Ontario (LIO) database;
- Natural Heritage Information Centre (NHIC) database;
- Online Atlas Data;
- Aquatic SAR distribution maps; and
- Other sources as outlined in subsequent sections (e.g., subwatershed studies, watershed management plans, fisheries management plans, e-bird, iNaturalist).

As part of this final report submission, GEI completed a secondary review of natural heritage information of the Study Area. This included:

- Relevant Legislation, Policies, and Guidelines
- Natural Heritage System Background Report (Beacon Environmental, 2021), to update SAR and natural heritage features lists.

- NHIC, to identify whether any additional SAR have been recorded since 2023, and to update SARO rankings.
- Aquatic SAR distribution maps, to identify any changes to SAR habitat mapping.

4.1 Natural Heritage System Background Report (Beacon, 2023)

Beacon Environmental Limited (Beacon), prepared the *City of Peterborough Official Plan Update Natural Heritage System Background Report* in November 2021, as a supporting document to the *City of Peterborough Official Plan* (2023). This document provides an overview of the City's natural heritage system (NHS). Beacon completed a comprehensive desktop review of the City to identify NHF's, and supplemented the desktop review with road-side reconnaissance-level surveys to verify the information obtained. Beacon then prepared updated NHS maps and revised existing or developed new policies. The NHS background report was guided by the Natural Heritage System Taskforce, which included members of the MNRF, ORCA, Peterborough Field Naturalists, Reimagine Peterborough, Curve Lake First Nation, and Hiawatha First Nation. Feedback was also solicited from stakeholders and community members, including at a Traditional Ecological Knowledge sharing event with Treaty 20 Rightsholders and another with Treaty 20 Elders. The information obtained in the NHS background Report has been included within **Section 4.2** Natural Heritage Features and **Section 4.3** Rare Species Records.

4.2 Natural Heritage Features

The following natural heritage features have been recorded in or within the vicinity of the Study Area. These features can be seen in **Table 1** below, as well as **Appendix A**, **Figures 2.1 – 2.13.**

Table 1: Results of the Background Information Review for the Presence of Natural Heritage Features recorded in or within 120 m of the Study Area

Feature Type	Proximity to the Study Area
Natural Heritage Systems (NHS)	There are several NHS mapped within the Study Area including: • City of Peterborough Official Plan (2023) • County of Peterborough Official Plan (1994, Consolidated 2022) • *County Official Plan* (Peterborough County, 2022; Not yet approved by MMAH) • Township of Otonabee-South Monaghan Official Plan (2013, Consolidated 2017) • Official Plan for the Township of Cavan Monaghan (2015, Amended 2021) The Study Area is not located within the Greenbelt or Oak Ridges Moraine Provincial Plan Areas.

Feature Type	Proximity to the Study Area
Woodlands	The Study Area contains numerous woodland and forest types including: • Coniferous Forest (FOC) • Mixed Forest (FOM) • Deciduous Forest (FOD) • Coniferous Swamp (SWC) • Mixed Swamp (SWM) • Deciduous Swamp (SWD) • Cultural Woodland (CUW) • Cultural Plantation (CUP) No significant woodlands have been identified by any of the relevant Official Plans.
Wetlands	There are several Provincially Significant Wetlands within or adjacent to the Study Area, including the: • Jackson Creek PSW • Jackson Creek East PSW • Loggerhead Marsh PSW • Harper Creek PSW • Peterborough Airport Wetland Complex PSW • Downer's Corners PSW • Cold Springs and Yankee Bonnet PSW • Nassau Wetland Complex PSW • Otonabee Midriver Complex PSW • Kiiktaanaa Mash'ing Wetland Complex PSW Numerous other evaluated (non-PSW) or unevaluated wetlands are also present within the Study Area, this includes, but is not limited to the: • Burnham Wood (Evaluated-non PSW) • Otonabee River Floodplain Swamp Complex (Evaluated-non PSW); • Cavan Creek Outlet Swamp (Evaluated-non PSW); • Crystal Springs Wetland Complex (Evaluated-non PSW);
Watercourses	The Study Area is located within the Otonabee River Subwatershed and the Jackson Creek Subwatershed. The Otonabee River and its associated tributaries is the main watercourse flowing through the Study Area. Watercourses in this watershed include warm and cold thermal regime creeks

Feature Type	Proximity to the Study Area
	and streams. There are also several small, naturally occurring waterbodies including Lily Lake and Little Lake. Some of the notable watercourses present within the Study Area include, but are not limited to: • Otonabee River • Trent-Severn Waterway • Curtis Creek • North Meade Creek • Meade Creek • Whitlaw Creek • Bears Creek • Byersville Creek • Jackson Creek • Thompson Creek • Riverview Creek
Valleylands	Two significant valleylands, the Otonabee River Valley and the Jackson Creek Valley, have been identified within the Study Area as per the *City of Peterborough Official Plan* (2023). Other valleylands, including significant valleylands may also be present within the Study Area, but not yet identified.
Fish Habitat	Fish habitat has not been identified within the Study Area (City of Peterborough Official Plan, 2023), but is associated with any aquatic feature (watercourse, waterbody, and/or wetland) that is suitable for fish at any given time of the year. It is anticipated that most watercourses and waterbodies will be considered fish habitat. Beacon (2023) identified that Harper Creek contains a unique coldwater urban Brook Trout system, one of few of its kind in Ontario.
Areas of Natural and Scientific Interest (ANSI)	There are no ANSIs located within the Study Area or within 120 m. The closest ANSIs are: • The Meade Creek Drumlin ANSI located approximately 1.3 km from the municipal boundary on the eastern side of Peterborough; and • The Jackson Creek Drumlins ANSI, located on the western side of the municipality, roughly 600 m from the municipal boundary

Feature Type	Proximity to the Study Area
Linkages	The Study Area contains a number of Regional and Proximity Linkages which have been identified in Schedule F of the City of Peterborough Official Plan.
Minimum Vegetation Protection Zones	Minimum Vegetation Protection Zones may be associated with the natural heritage features listed in this table and are described within Section 4.6.2.n of the *City of Peterborough Official Plan* (2023). Where required, a minimum VPZ should be determined at the site-specific stage.

4.3 Rare Species Records

The Study Area has the potential to contain a number of rare species. This includes Species at Risk (those listed as Threatened or Endangered on the Species at Risk in Ontario (SARO) list), Species of Special Concern (those listed as Special Concern on the SARO list), and Rare Species (those identified as an S1-S3 on the Natural Heritage Information Centre (NHIC) database).

Species at Risk and their habitat are protected under the ESA, with aquatic species receiving further protection under the SARA and the *Fisheries Act*.

The following databases were searched for records of federally and/or provincially significant plants, vegetation communities and wildlife on, and in the vicinity of the Study Area:

- Natural Heritage Information Centre (NHIC) database (MNRF 2025) database provides occurrence data by 1 km^2 area squares, with 118 squares overlapping the Study Area.
- The Ontario Reptile and Amphibian Atlases (Ontario Nature, 2020) contain detailed information on the population and distribution status of Ontario reptiles and amphibians. The data is presented on 100 km^2 area squares with 4 squares overlapping the Study Area (17QK11, 17QK10, 17QK00, 17QJ19).
- The Ontario Butterfly and Moth Atlases (Toronto Entomologists' Association 2023, 2020) contain detailed information on the population and distribution status of Ontario butterflies and moths. The data is presented on 100 km^2 area squares with 4 squares overlapping the Study Area (17QK11, 17QK10, 17QK00, 17QJ19).
- The Ontario Breeding Bird Atlas (OBBA) contains detailed information on the population and distribution status of Ontario birds (Bird Studies Canada et al. 2006). The data is presented on 100 km^2 area squares with 4 squares overlapping the Study Area (17TQK11, 17TQK10, 17TQK00, 17TQJ19).

- Aquatic species at risk distribution mapping (DFO 2025) was reviewed to identify any known occurrences of aquatic SAR, including fish and mussels, within the subwatershed where the Study Area are located. No aquatic SAR were identified on or within 120m of the Study Area.
- Citizen Science Databases - As the observations in these databases can be submitted by anyone, and the records are not officially vetted, the data obtained from this tool should not be used as a clear indicator of species presence, and species may be filtered out based on habitat and target survey efforts.
    - The iNaturalist (2023) database is a large citizen science-based identification and data collection app. It allows any citizen to submit observations to be reviewed and identified by other naturalists and scientists to help provide accurate species observations. This online database was examined to identify observations made within the Study Area or that were research grade.
    - The eBird (2023) database is a large citizen science-based project with a goal to gather bird diversity information in the form of checklists of birds, archive it, and share it to power new data-driven approaches to science, conservation and education.
- Beacon (2023) identified 17 species listed as threatened or endangered that are known to have been recorded within the City of Peterborough.

It should be noted that the Study Area does not comprise the entirety of the squares from the various atlases used to obtain these records. Habitat type, availability and size are all contributing factors in presence and use by SAR.

Through the background information review a total of 133 rare species records were obtained. Of these records, 16 species were listed as Endangered, 11 as Threatened, 22 as Special Concern, and 84 as S1-S3. Refer to **Appendix B - Table 1** for additional details, including species name, ESA status, and record source.

5. NATURAL HERITAGE GAPS

Where projects and sites are proposed through the SMP process, additional site specific studies may be necessary to further evaluate potential ecological constraints. An appropriately scoped field program should be developed in consultation with Williams Treaty First Nations.

The following are studies that may be required to establish a better understanding of natural heritage characteristics for the purposes of impact assessment and mitigation measures for any short-listed projects:

- Ecological Land Classification and Botanical Inventory
- Wetland Characterization;

- Woodland Characterization;
- Aquatic Habitat Assessment;
- Headwater Drainage Feature Analysis;
- Significant Wildlife Habitat Assessment;
- Amphibian Call Count Surveys;
- Turtle Basking and Nesting Surveys;
- Snake Transect Surveys;
- Breeding Bird Surveys;
- Bat Acoustic Monitoring Surveys; and,
- Insect Surveys.

Additional field studies may be required, as determined by preliminary field surveys or upon direction from Williams Treaty First Nations.

6. PROPOSED PROJECTS

Since the initial preparation of the Draft Sanitary Master Plan, a list of key proposed projects has been identified within the Study Area. These projects are further described in **Table 2** below and include:

- **SAN-4**: Twin trunk under Otonabee River
- **SAN-9**: Northeast trunk sewer storage
- **SAN-23**: Airport forcemain
- **SPS-1**: Ashburnham sanitary pumping station (SPS) replacement
- **SPS-2**: Monaghan SPS replacement
- **SPS-3:** Airport SPS replacement
- **WWTP-1:** Wastewater treatment plant (WWTP) upgrades

Table 2: List of Proposed Projects and their Potential Ecological Constraints, as well as an Overview of the Anticipated Studies and Permits/Approvals Required.

Project ID	Project Name	Project Description	Ecological Constraints	Additional Studies	Permitting and Approvals
SAN-4	Twin trunk under Otonabee River	The proposed twin trunk will go under the Otonabee River from Cameron Street to the Peterborough WWTP on Kennedy Road.	• Crossing underneath the Otonabee River, which is considered fish habitat. • Vegetation including trees and shrubs are present along both sides of the riverbanks. • Potential for SAR, SCC, or SWH to be present within natural features.	• Fish Community Assessment to determine a suitable setback from Otonabee River for the work area. • SAR/SCC/SWH screening to determine if suitable habitat is present. • Tree inventory and arborist report. Identifying any trees to be removed, retained, or injured. • Sediment and Erosion Control Plan to protect Otonabee River.	• DFO Consultation and Request for Review (RFR). • Section 28 Permit for Development from ORCA.
SAN-9	Northeast Trunk Sewer Storage	The proposed inline storage pipe will be located within a previously disturbed area (gravel parking lot) near Trent University. This will reduce the potential for untreated discharges into Otonabee River.	• Otonabee River is located to the north, Trent-Severn Canal to the south. • Work area is within close proximity to the riverbanks (< 10 m) and fish habitat. • Proposed work area has 5-10 trees and shrubs present. • Potential for SAR, SCC, or SWH to be present within natural features.	• Fish Community Assessment to determine a suitable setback from Otonabee River for the work area. • SAR/SCC/SWH screening to determine if suitable habitat is present. • Tree inventory and arborist report. Identifying any trees to be removed, retained, or injured. • Sediment and Erosion Control Plan to protect Otonabee River and the Trent-Severn Canal.	• DFO Consultation and Request for Review (RFR). • Permit from Parks Canada for development adjacent to the Trent-Severn Waterway. • Section 28 Permit for Development from ORCA.
SPS-1	Ashburnham SPS replacement	The proposed works will occur at the existing Ashburnham SPS facility to increase capacity.	• Numerous trees and shrubs surround the building (30+). • Meade Creek to the north. • Woodlands to the north and east. • Potential for SAR, SCC, or SWH to be present within natural features.	• Tree inventory and arborist report. Identifying any trees to be removed, retained, or injured. • Tree protection plan for any trees that will be retained.	• None identified
SPS-2	Monaghan SPS replacement	The proposed works will occur at the existing Monaghan SPS facility to increase capacity.	• Otonabee River to the immediate southeast. • Work area is within close proximity to the riverbanks (< 10 m) and fish habitat. • Mature trees surround the southeast side of the building (30+). • Floodplain. • Potential for SAR, SCC, or SWH to be present within natural features.	• Fish Community Assessment to determine a suitable setback from Otonabee River for the work area. • SAR/SCC/SWH screening to determine if suitable habitat is present. • Tree inventory and arborist report. Identifying any trees to be removed, retained, or injured. • Sediment and Erosion Control Plan to protect the Otonabee River.	• DFO Consultation and Request for Review (RFR). • Section 28 Permit for Development from ORCA.
SPS-3	Airport SPS replacement	The proposed works will occur at the existing Airport SPS facility to increase capacity.	• A watercourse is located to the south of the existing SPS and drains easterly to the Otonabee River Floodplain Swamp Complex (non-PSW). • Potential for SAR, SCC, or SWH to be present within natural features.	• Sediment and Erosion Control Plan to protect unnamed watercourse.	• Section 28 Permit for Development from ORCA (floodplain).

Project ID	Project Name	Project Description	Ecological Constraints	Additional Studies	Permitting and Approvals
WWTP-1	Wastewater Treatment Plant upgrades	The proposed works will occur within the existing WWTP property and consist of upgrades.	• Otonabee River is located to the north, which is considered fish habitat. This area contains numerous mature trees along the riverbank. • A woodland and unevaluated wetland is located within the western portion of the property. • A mixed shrub community is located within the southern portion of the property. • Additional trees, as part of a windrow are located to the east of the property. • Potential for SAR, SCC, or SWH to be present within natural features.	• Fish Community Assessment to determine a suitable setback from Otonabee River for the work area. • Ecological Land Classification to determine vegetation community types present and whether SAR habitat or SWH is present. • Tree inventory and arborist report. Identifying any trees to be removed, retained, or injured. • Sediment and Erosion Control Plan to protect the Otonabee River and the nearby wetland. • Environmental Impact Study may be required if encroaching on features.	• DFO Consultation and Request for Review (RFR). • Section 28 Permit for Development from ORCA.
SAN-23	Airport forcemain	The proposed airport forcemain travels from the intersection of Sir Sandford Fleming Drive and Brealey Drive/Airport Road, south along Airport Road, until it reaches the Airport property, south of Mervin Line. This route is approximately 3 km.	• The northwest corner of the Sir Sandford Fleming Drive and Brealey Drive/Airport Road intersection contains a woodland and two unevaluated wetlands. • The Peterborough Airport Wetland Complex (PSW) is located immediately east of Airport Road, between Fisher Drive and Brown Line. • At Highway 115, all four corners contain woodlands and wetlands, with some being part of the Peterborough Airport Wetland Complex (PSW) • South of Beardsmore Road, the woodlands and Peterborough Airport Wetland Complex (PSW) continues along the western portion of Airport Road. • South of Mervin Line and Airport Road, there is a small woodland on the southwest corner, and on the southeast corner there is the Otonabee River Floodplain Swamp Complex (non-PSW) and associated woodlands. • A watercourse flows along the west side of Airport Road, from Fleming College Way, where it crosses near Spillsbury Drive and continues along the east side of Airport Road, until emptying into the wetland near Fisher Drive. • Another watercourse travels down Mervin Line until it reaches Airport road, then heads south along the western side of Airport Road, until it reaches Mel O'Brien Way. Here it crosses over Airport Road and empties into the Otonabee River Floodplain Swamp Complex (non-PSW). A portion of the watercourse continues west along Mel O'Brien Way. • Potential for SAR, SCC, or SWH to be present within natural features.	• Aquatic Habitat Assessment and Fish Community Assessment to determine a suitable setback from the watercourses for the work. • Ecological Land Classification to determine vegetation community types present and whether SAR habitat or SWH is present. • Tree inventory and arborist report. Identifying any trees to be removed, retained, or injured. • Sediment and Erosion Control Plan to protect nearby watercourses and wetlands. • Delineation of wetlands and woodlands along the right-of-way.	• DFO Consultation and Request for Review (RFR). • Section 28 Permit for Development from ORCA.

Notes:

- Where SAR and their habitat are identified, additional consultation and permitting may be required through the MECP.
- Where aquatic SAR and their habitat are identified, additional consultation and permitting may be required through the DFO.
- It is assumed that project footprints will avoid natural heritage features, where possible.

7. MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENTS

It is anticipated that many of these key proposed projects (**Section 6**) will be exempt from the Municipal Class Environmental Assessment (MCEA) process. According to the Municipal Engineers Association Guide (MEA Guide, 2023; Section A.1.2.2), exempt projects are limited in scale and have minimal adverse environmental effects. Where a project is exempt from the MCEA process, proponents are still responsible for obtaining and adhering to any other applicable permits, approvals, or authorizations, including but not limited to those for species at risk and fish.

The exemption and screening criteria for Municipal Water and Wastewater Projects are found in Table B, Appendix A of the MCEA Guide (MEA, 2023). As per row 22b, where a sewage collection system can be established, extended, or enlarged entirely within the existing road allowance or utility corridor, and all water crossings are completed via trenchless technology, the project is considered exempt. Where a project cannot complete all water crossings via trenchless technology, the project may be considered a 22c project where a Schedule B MCEA would be required. Within the MEA Guide (2023), a 'water crossing (water and wastewater)' has the meaning of "*a sewage, stormwater management or water facility or a component thereof, which crosses over, under or through a naturally occurring water body or surface drainage feature such as a lake, swamp, marsh, bay, river, creek, stream or man-made drainage facility such as a ditch, canal or municipal drain*."

Of the seven projects identified in **Section 6** and **Table 2** above, two have been identified as projects requiring that a Schedule B be completed as part of the SMP. This includes:

- **SPS-2**: Monaghan SPS replacement
- **SPS-3:** Airport SPS replacement

For each of these projects, a site-specific natural heritage screening will be completed to ensure that the Phase 1 and Phase 2 MCEA criteria have been met and to support the next iteration of the SMP.

Where possible, projects should avoid impacts to natural heritage features. Where this is not possible, these impacts should be appropriately identified and mitigated during the MCEA process. Where impacts require mitigation, an Environmental Impact Study (EIS) may also be required to support the MCEA. The presence of species at risk and their habitats, along with fish habitat should also be identified during the MCEA process. Where SAR habitat is present, additional consultation with the Ministry of Environment, Conservation and Parks would be required to determine if any additional permits or approvals are necessary. Where fish habitat, and/or aquatic species at risk may be present, additional consultation with the DFO would be required to determine if any additional permits or approvals are necessary.

8. NEXT STEPS

The next steps for each of the seven proposed projects have been identified in **Table 2** above. This table provides a comprehensive list of the identified natural heritage studies and the permitting and approvals that may be required for the project. Many of these studies can be completed at the detailed design phase of a project lifecyle.

To support those projects that will require a Schedule B Municipal Class Environmental Assessment to be completed, as identified in **Section 7** above, additional natural heritage investigations are proposed. This includes:

- Comprehensive Background Review Screening
- Ecological Land Classification (via ortho-imagery)
- Species at Risk Habitat Identification

GEI staff will complete these additional investigations in Spring 2025, and will include the results within the updated SMP. Additional reporting will include:

- Evaluation of Alternatives (Terrestrial, Aquatic, and SAR Impacts)
- Recommendations, Mitigation Measures and Best Management Practices
- Overview of Remaining NH Permits and Approvals

Consultation with Williams Treaty First Nations will continue through the site-specific stage.

9. CONCLUSION

The Study Area is considerable in size, extending across The City of Peterborough, and including the Peterborough Airport and the Peterborough Landfill in the neighbouring County of Peterborough. The landscape is diverse, with existing and ongoing urban development and a variety of natural heritage features. Despite this, there is an abundance of natural heritage features present such as PSWs, other wetlands, woodlands, the NHS, ORCA regulated areas, and ecological linkages.

Consultation with Williams Treaty First Nations will allow for further refinement and understanding of the natural heritage features present, followed by appropriate site-specific field data collection where servicing projects are proposed.

Yours truly,

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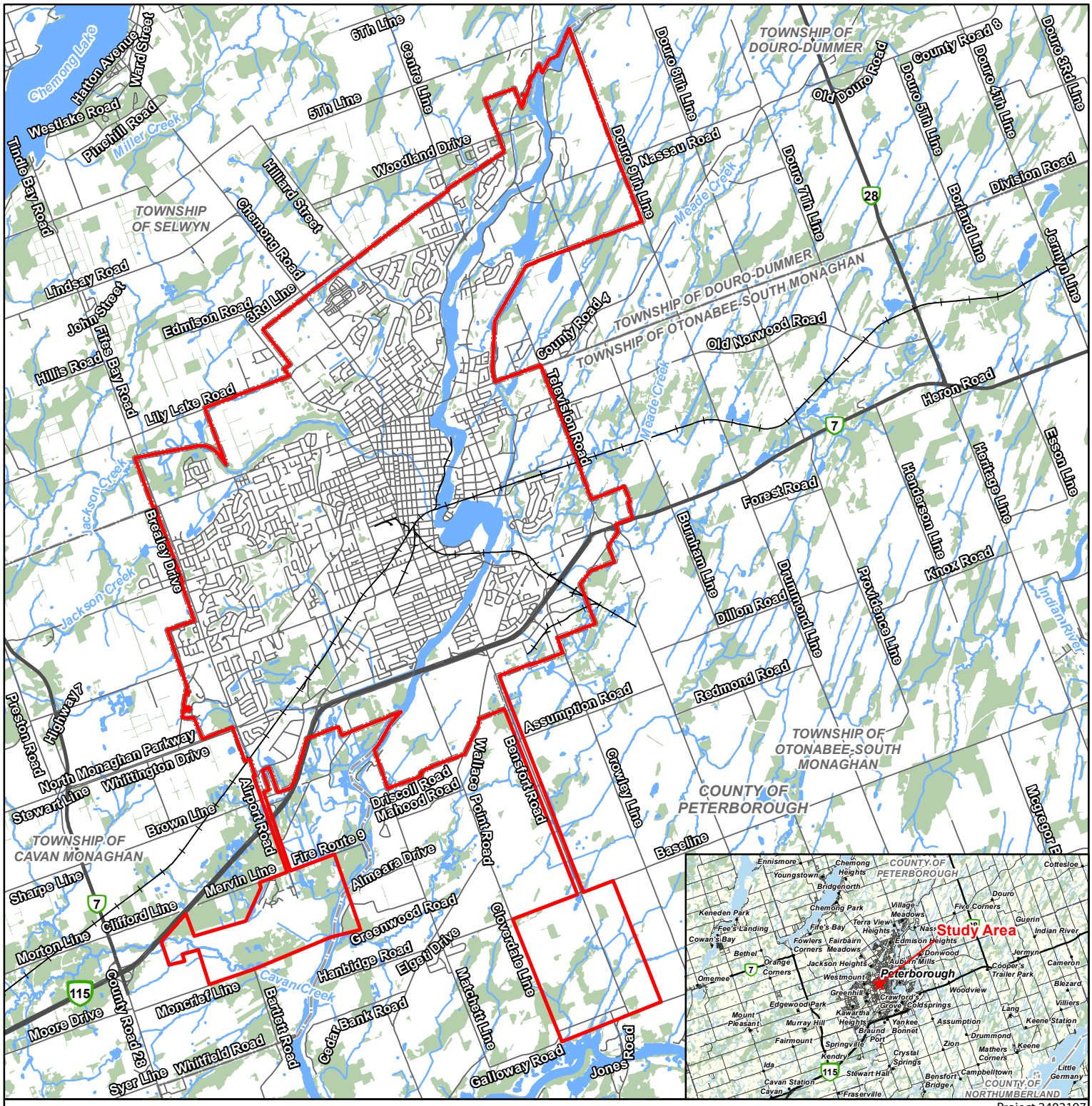
Appendix A – Figures



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1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2025.

Legend

- Study Area
- Railway
- Municipal Boundary, Lower/Single Tier
- Municipal Boundary, Upper Tier
- Watercourse
- Waterbody
- Wooded Area

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1:100,000

N

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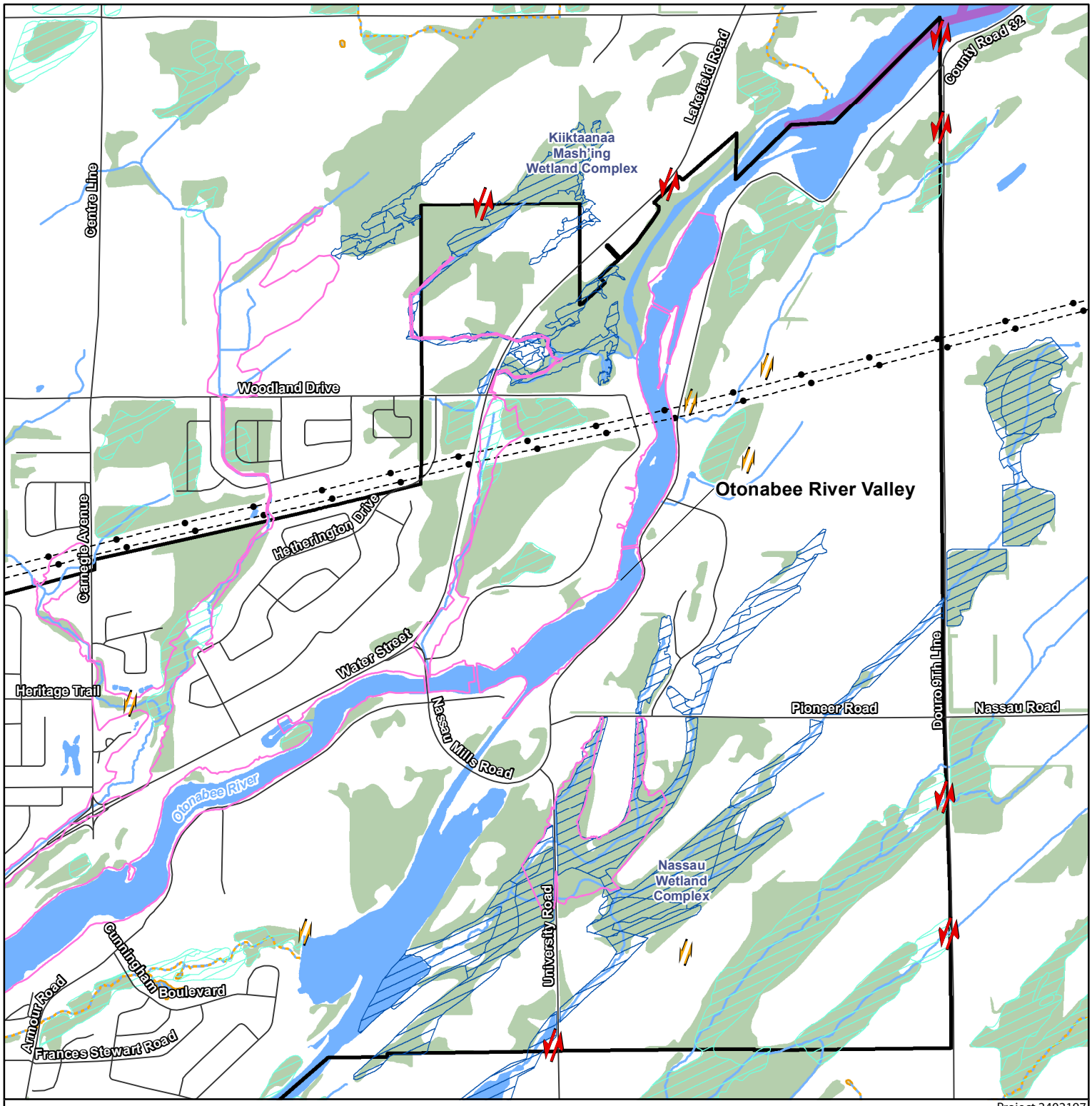
Peterborough Sanitary Master Plan
City of Peterborough

Figure 1
Location of Study Area



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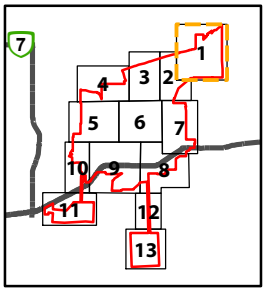

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- Hydro Line
- Road
- Provincially Significant Wetland
- Wetland - Not evaluated per OWES
- Waterbody
- Watercourse
- Waterbody Thermal Regime, Warm
- Watercourse Thermal Regime, Warm
- Aquatic Species at Risk - Fish
- Floodplain Area (ORCA)
- Woodland (LIO)
- Regional Connections
- Proximity Linkages

Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.1
Natural Heritage Features

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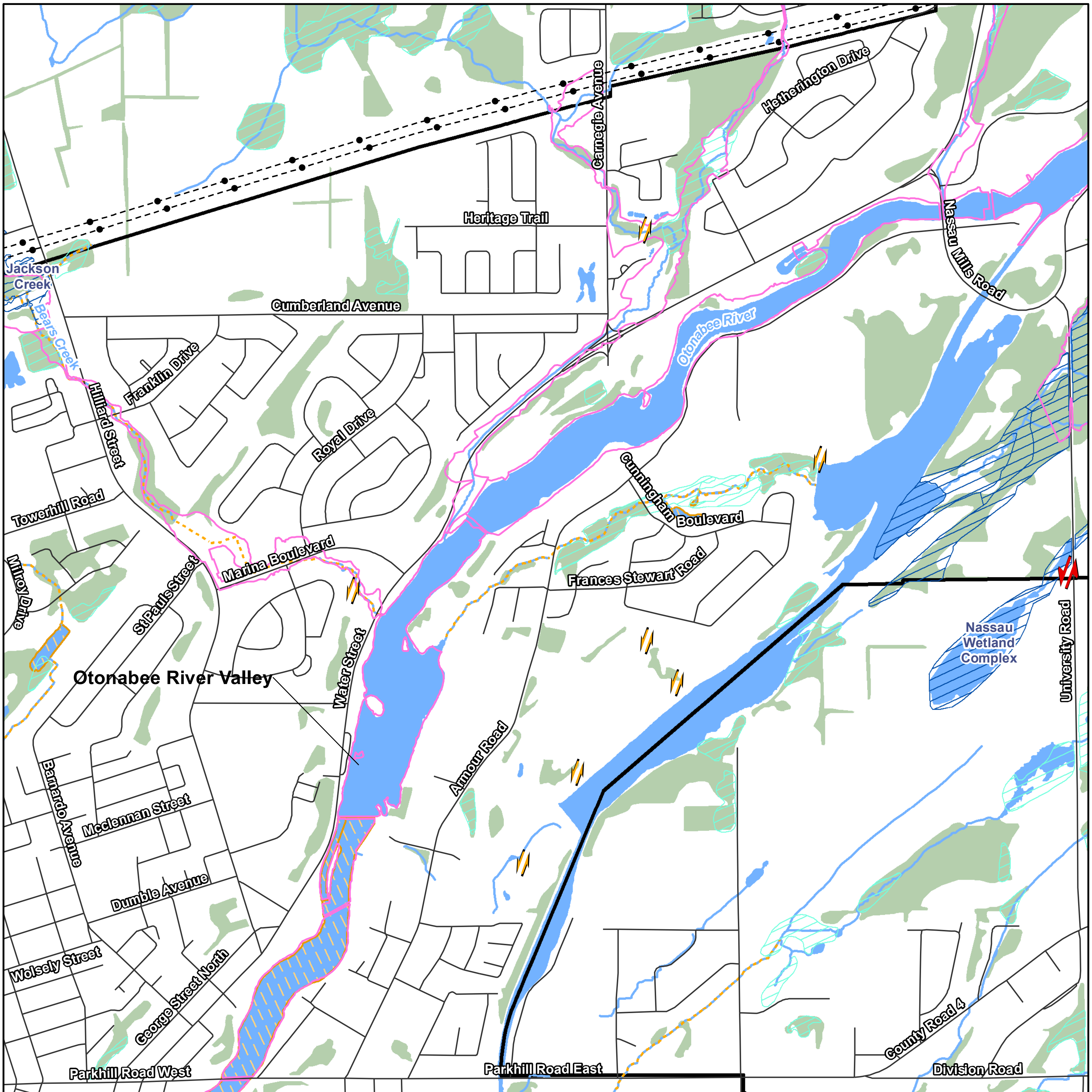

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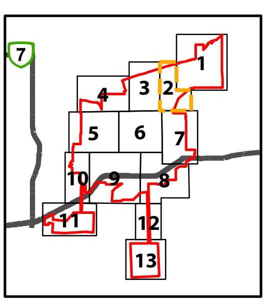

Legend

- Study Area
- Hydro Line
- Road
- Provincially Significant Wetland
- Wetland - Not evaluated per OWES
- Waterbody
- Watercourse
- Waterbody Thermal Regime, Warm
- Watercourse Thermal Regime, Warm
- Floodplain Area (ORCA)
- Woodland (LIO)
- Regional Connections
- Proximity Linkages

Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.2
Natural Heritage Features

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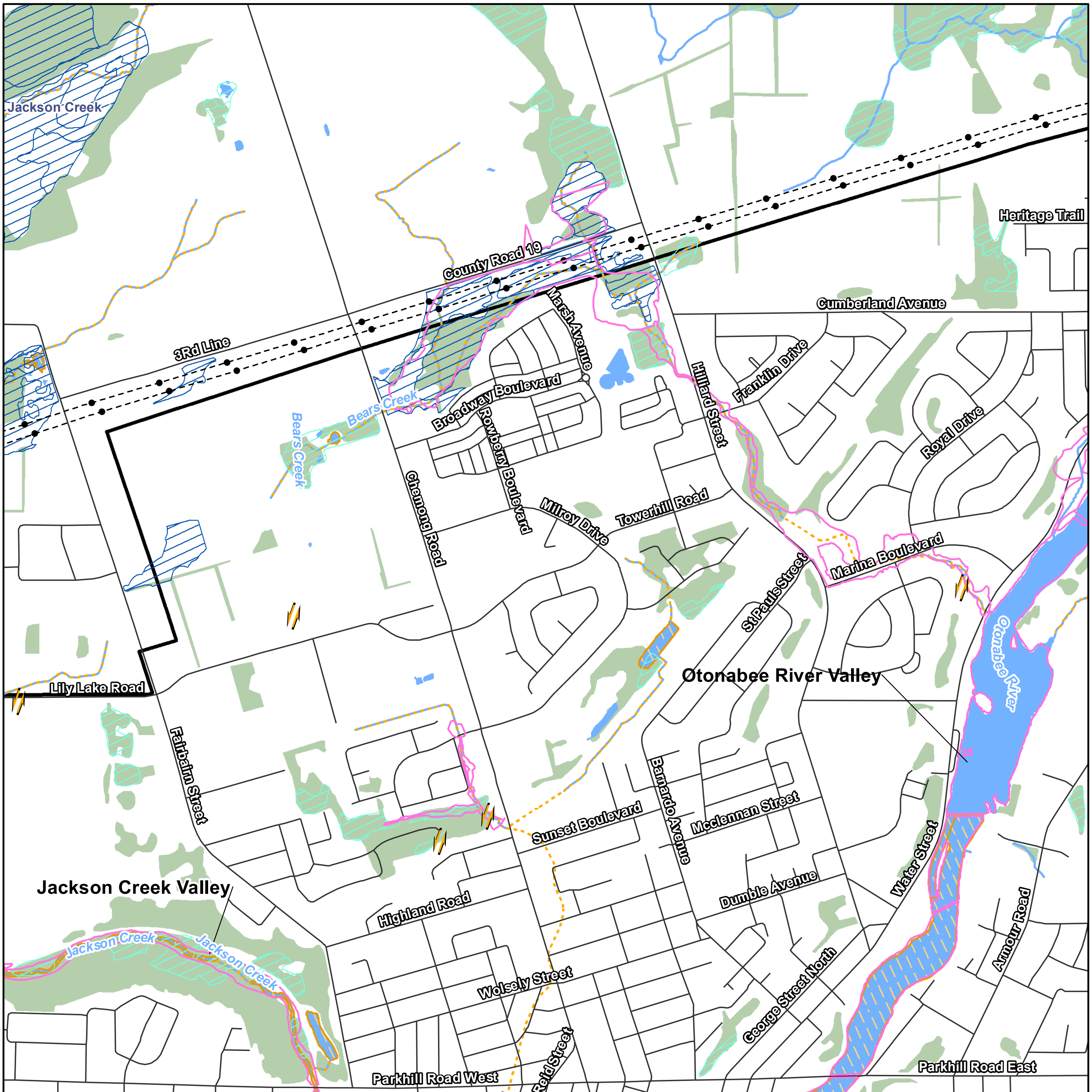

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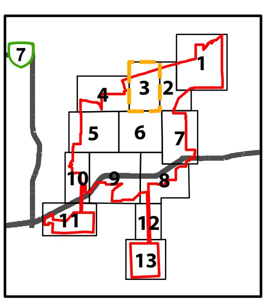

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- Study Area
- Hydro Line
- Road
- Provincially Significant Wetland
- Wetland - Not evaluated per OWES
- Waterbody
- Watercourse
- Waterbody Thermal Regime, Warm
- Watercourse Thermal Regime, Warm
- Floodplain Area (ORCA)
- Woodland (LIO)
- Proximity Linkages

Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.3
Natural Heritage Features

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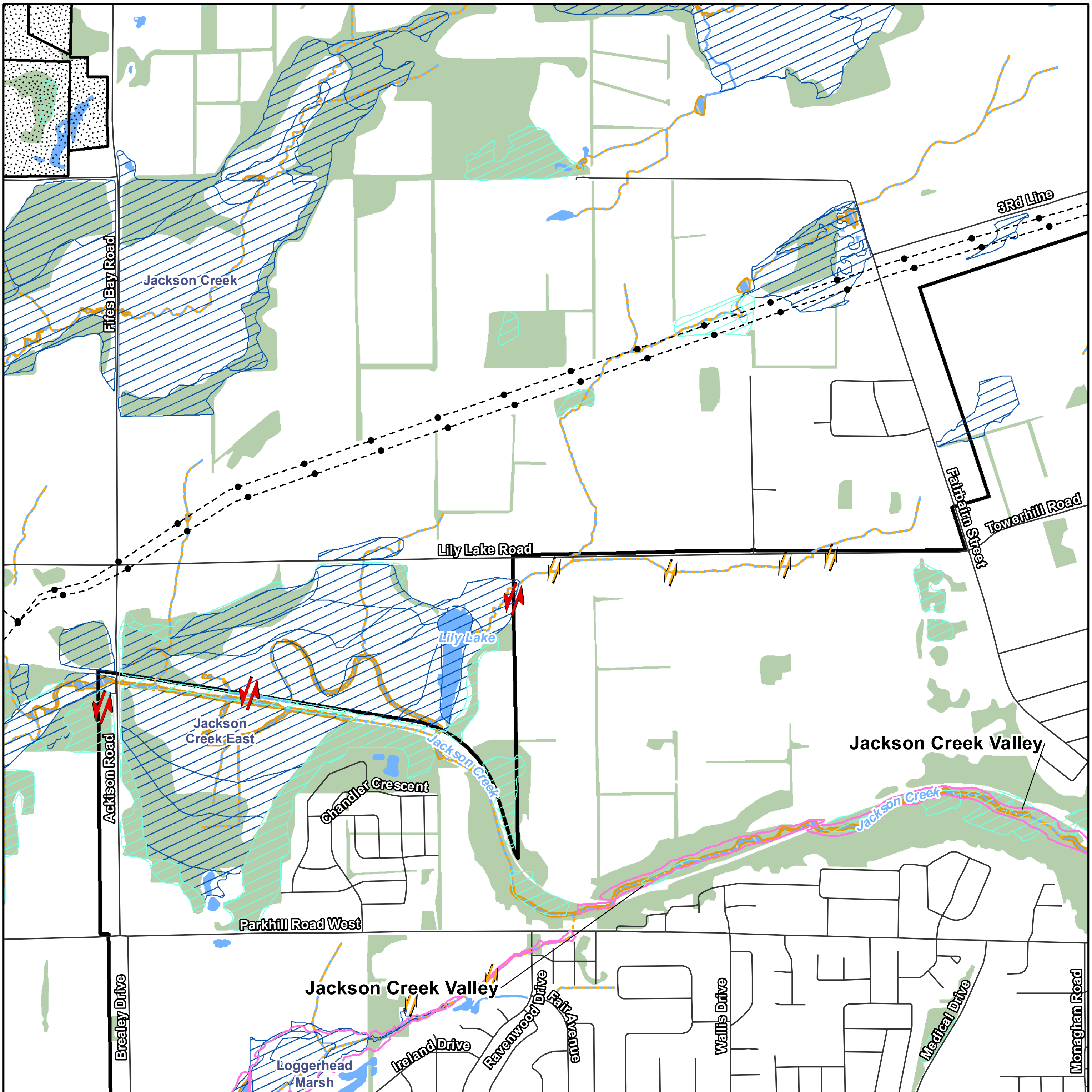

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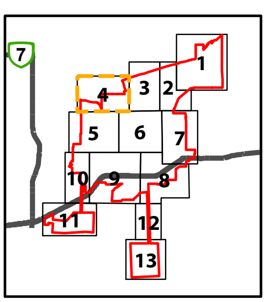

Legend

- Study Area
- Hydro Line
- Road
- Aggregate Site - Active
- Provincially Significant Wetland
- Wetland - Not evaluated per OWES
- Waterbody
- Watercourse
- Waterbody Thermal Regime, Warm
- Watercourse Thermal Regime, Warm
- Floodplain Area (ORCA)
- Woodland (LIO)
- Regional Connections
- Proximity Linkages

Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.4
Natural Heritage Features

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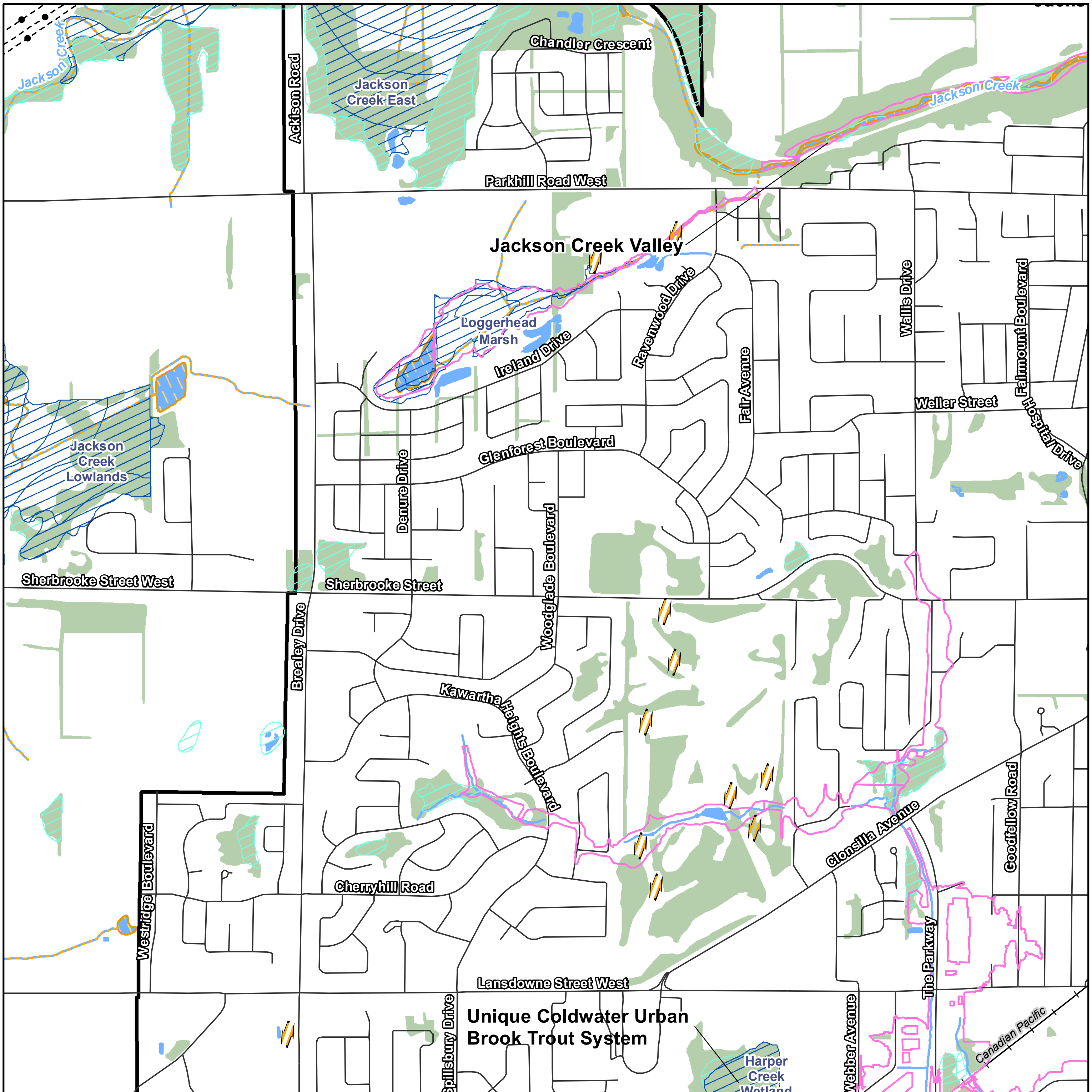

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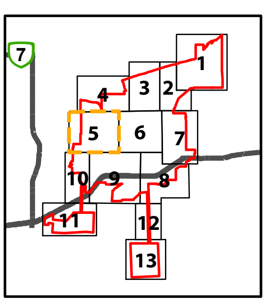

Legend

- Study Area
- Hydro Line
- Railway
- Road
- Provincially Significant Wetland
- Wetland - Not evaluated per OWES
- Waterbody
- Watercourse
- Waterbody Thermal Regime, Warm
- Watercourse Thermal Regime, Warm
- Floodplain Area (ORCA)
- Woodland (LIO)
- Proximity Linkages

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Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.5
Natural Heritage Features

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N

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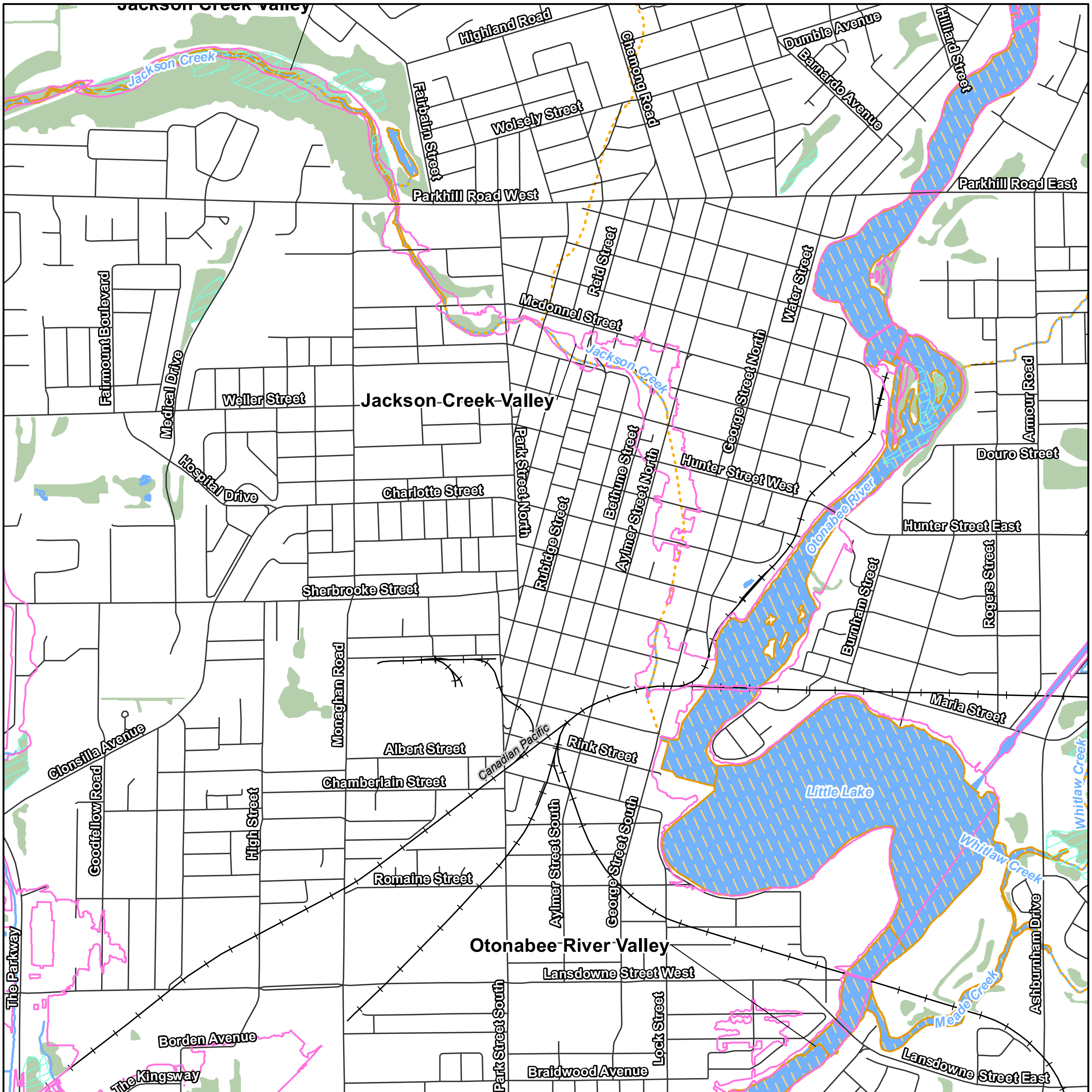

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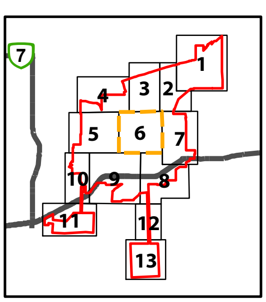
Legend

- Study Area
- Railway
- Road
- Wetland - Not evaluated per OWES
- Waterbody
- Watercourse
- Waterbody Thermal Regime, Warm
- Watercourse Thermal Regime, Warm
- Floodplain Area (ORCA)
- Woodland (LIO)



Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.6
Natural Heritage Features

0 200 m
1:20,000

N

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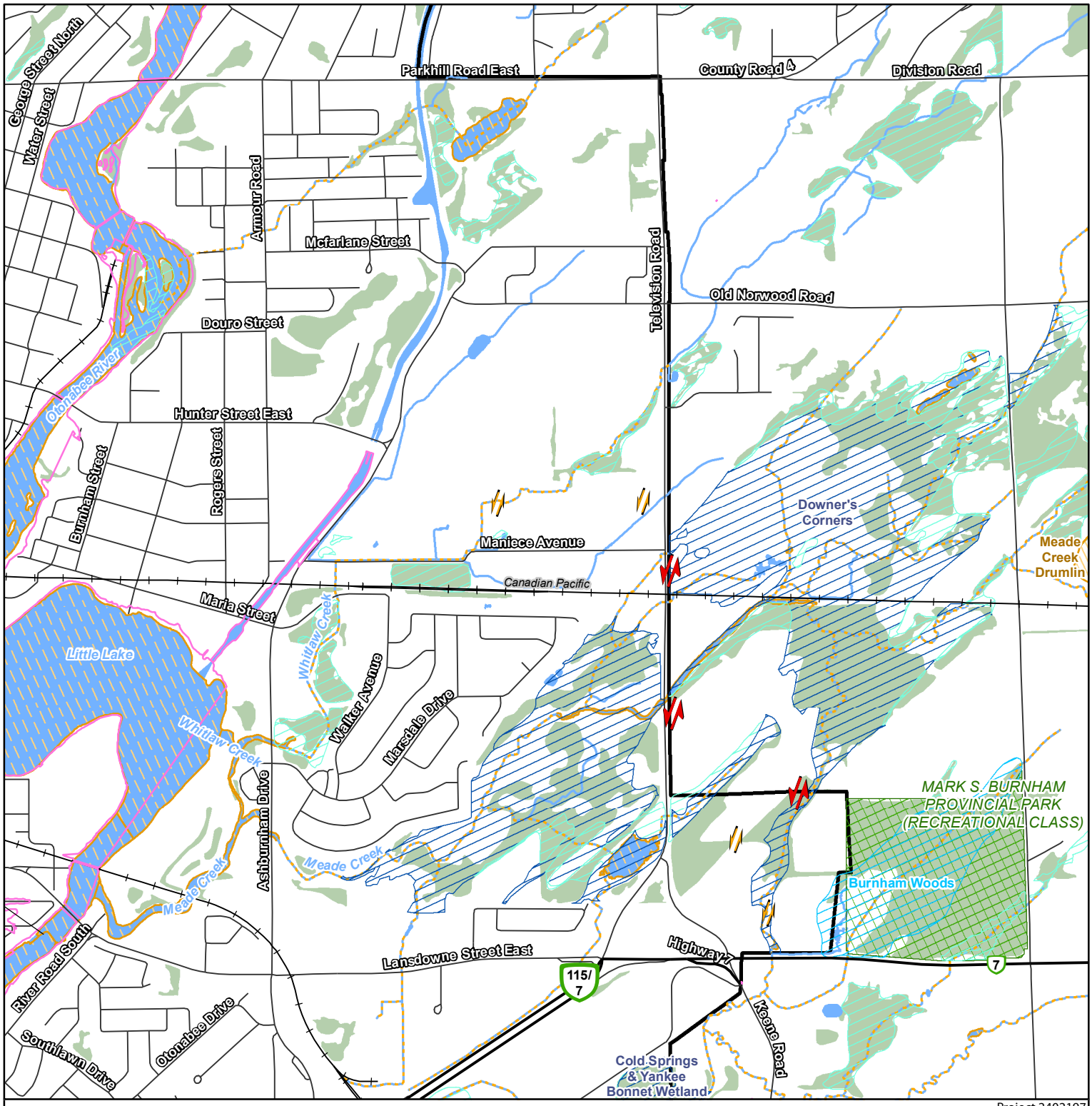

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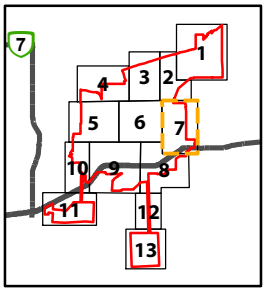

Legend

- Study Area
- Railway
- Highway
- Road
- Provincially Significant Earth Science ANSI
- Provincially Significant Wetland
- Locally/Other Significant Wetland
- Wetland - Not evaluated per OWES
- Provincial Park, Regulated
- Waterbody
- Watercourse
- Waterbody Thermal Regime, Warm
- Watercourse Thermal Regime, Warm
- Floodplain Area (ORCA)
- Woodland (LIO)
- Regional Connections
- Proximity Linkages

Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.7
Natural Heritage Features

0 200 m
1:20,000

N

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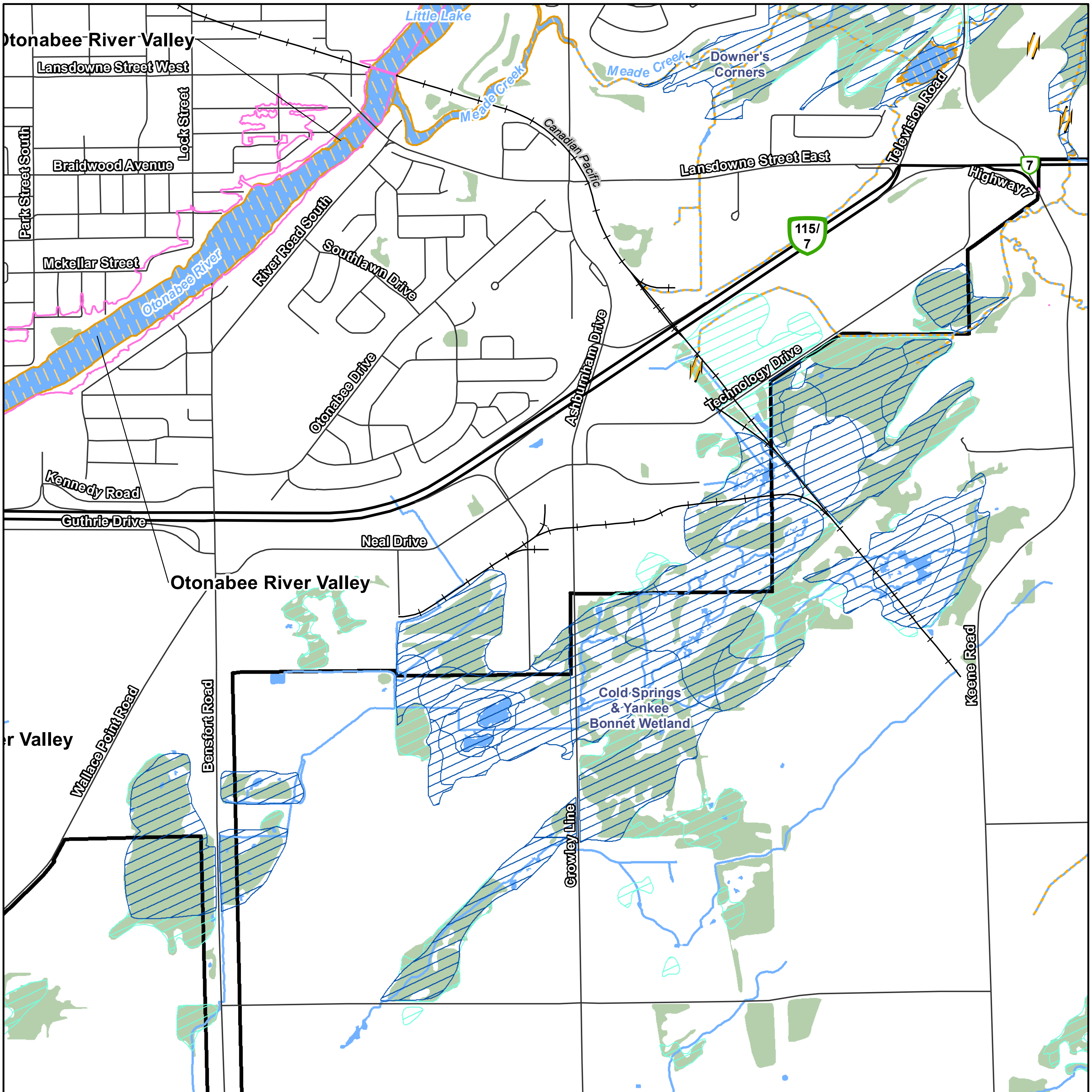

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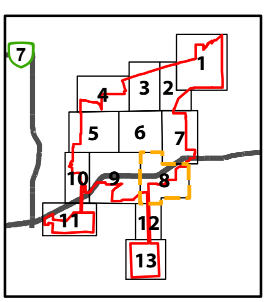

Legend

- Study Area
- Railway
- Highway
- Road
- Provincially Significant Wetland
- Wetland - Not evaluated per OWES
- Waterbody
- Watercourse
- Waterbody Thermal Regime, Warm
- Watercourse Thermal Regime, Warm
- Floodplain Area (ORCA)
- Woodland (LIO)
- Regional Connections
- Proximity Linkages

Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.8
Natural Heritage Features

0 200 m
1:20,000
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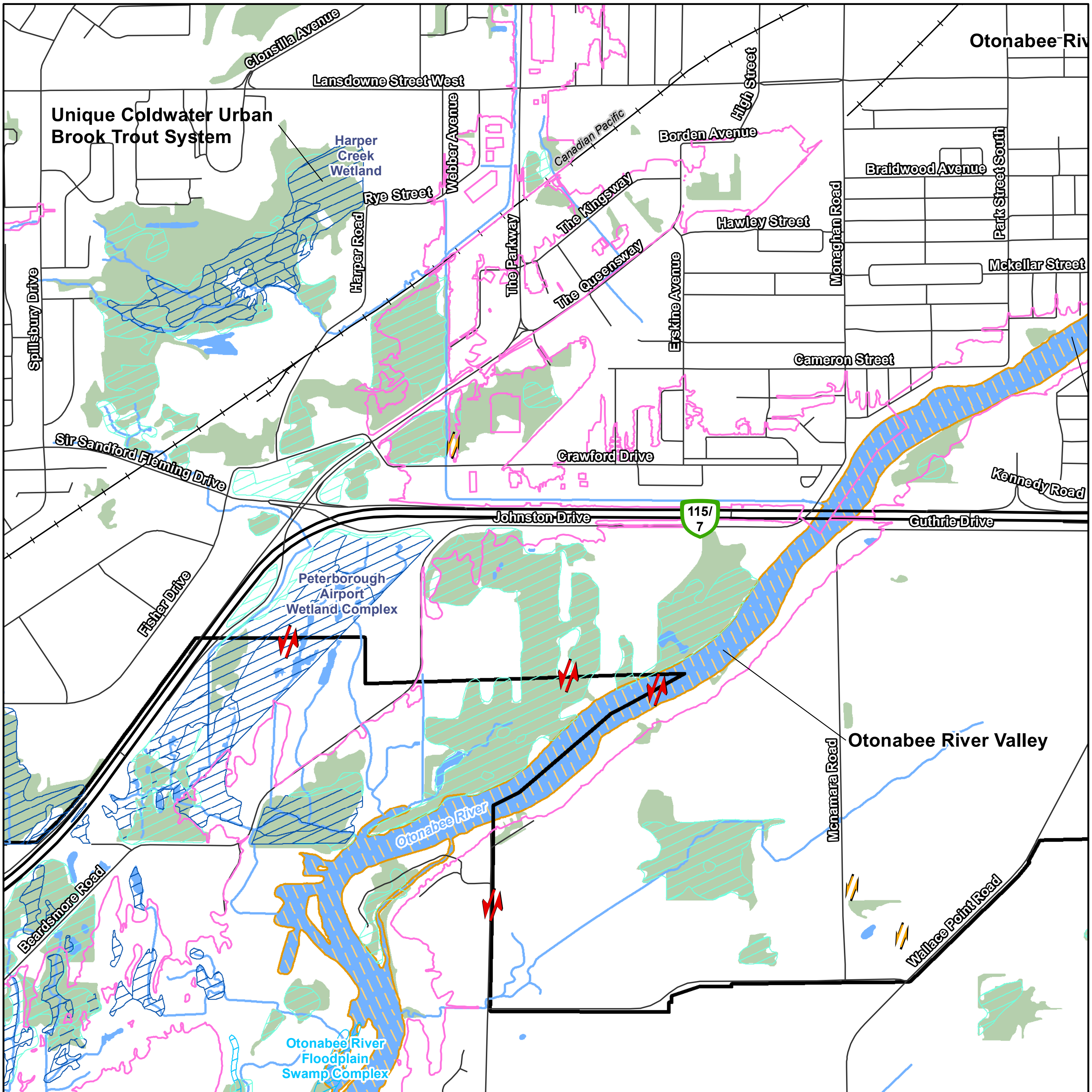

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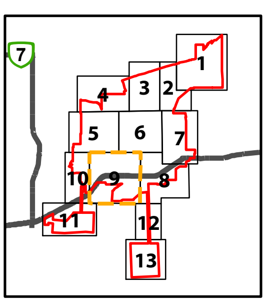

Legend

- Study Area
- Railway
- Highway
- Road
- Provincially Significant Wetland
- Locally/Other Significant Wetland
- Wetland - Not evaluated per OWES
- Waterbody
- Watercourse
- Waterbody Thermal Regime, Warm
- Floodplain Area (ORCA)
- Woodland (LIO)
- Regional Connections
- Proximity Linkages

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Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.9
Natural Heritage Features

0 200 m
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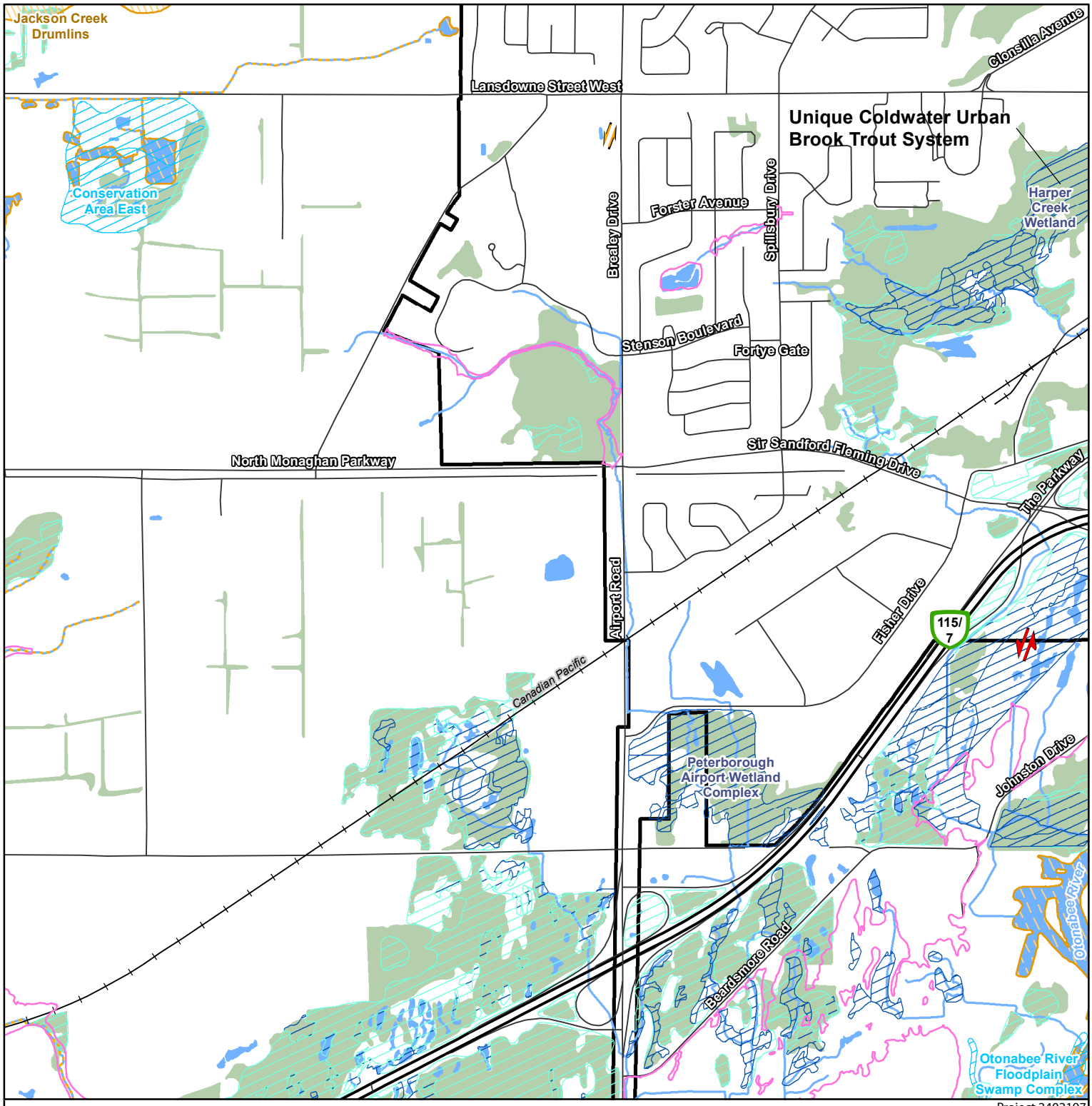

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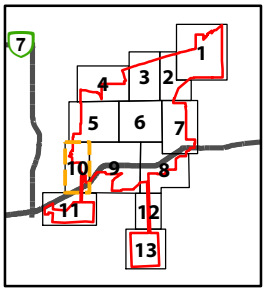

Legend

- Study Area
- Railway
- Highway
- Road
- Provincially Significant Earth Science ANSI
- Provincially Significant Wetland
- Locally/Other Significant Wetland
- Wetland - Not evaluated per OWES
- Waterbody
- Watercourse
- Waterbody Thermal Regime, Warm
- Watercourse Thermal Regime, Warm
- Floodplain Area (ORCA)
- Woodland (LIO)
- Regional Connections
- Proximity Linkages

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Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.10
Natural Heritage Features

0 200 m
1:20,000

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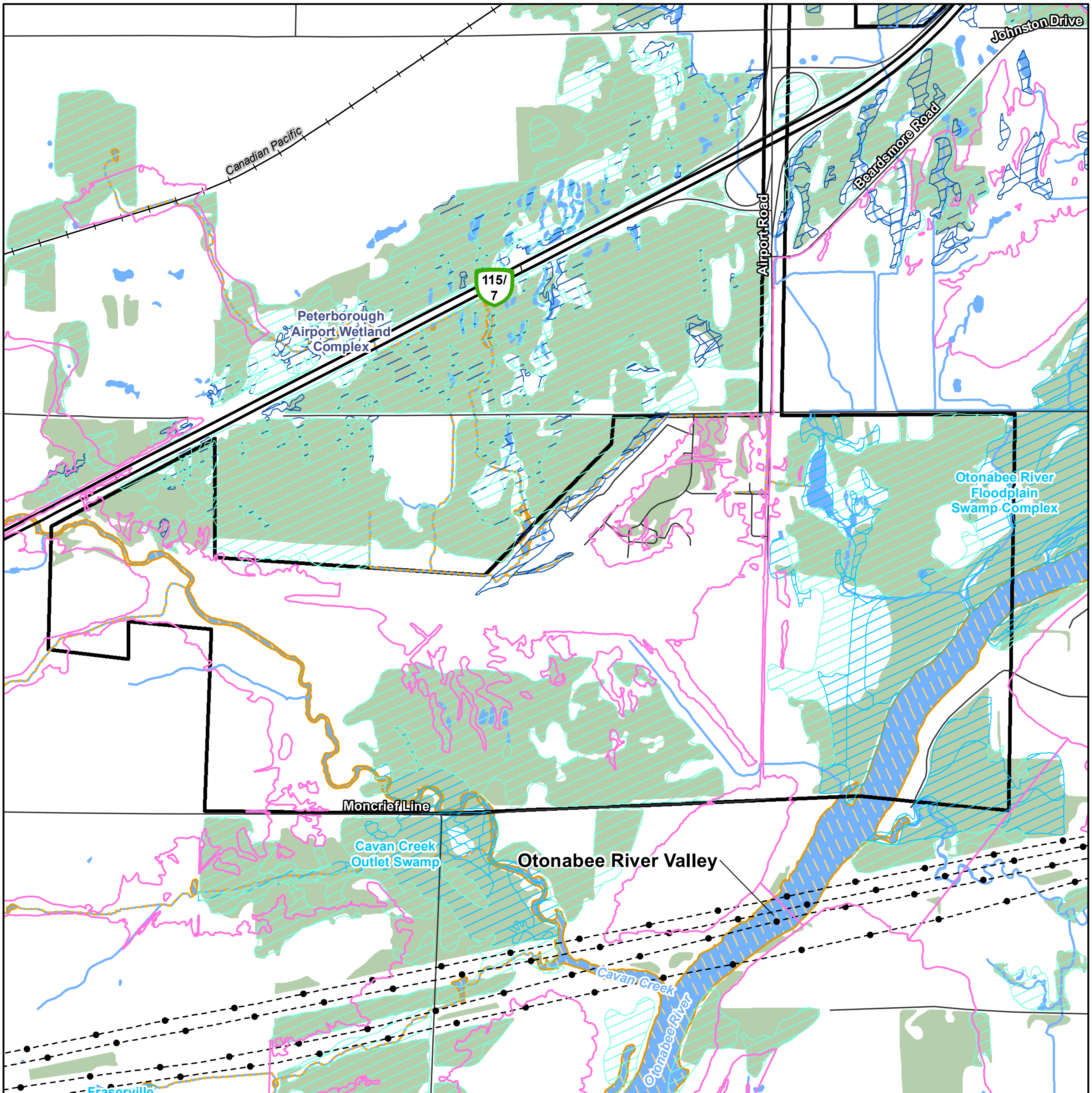

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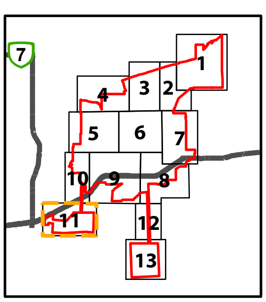

Legend

- Study Area
- Hydro Line
- Railway
- Highway
- Road
- Provincially Significant Wetland
- Locally/Other Significant Wetland
- Wetland - Not evaluated per OWES
- Waterbody
- Watercourse
- Waterbody Thermal Regime, Warm
- Watercourse Thermal Regime, Warm
- Floodplain Area (ORCA)
- Woodland (LIO)

Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.11
Natural Heritage Features

0 200 m
1:20,000

N

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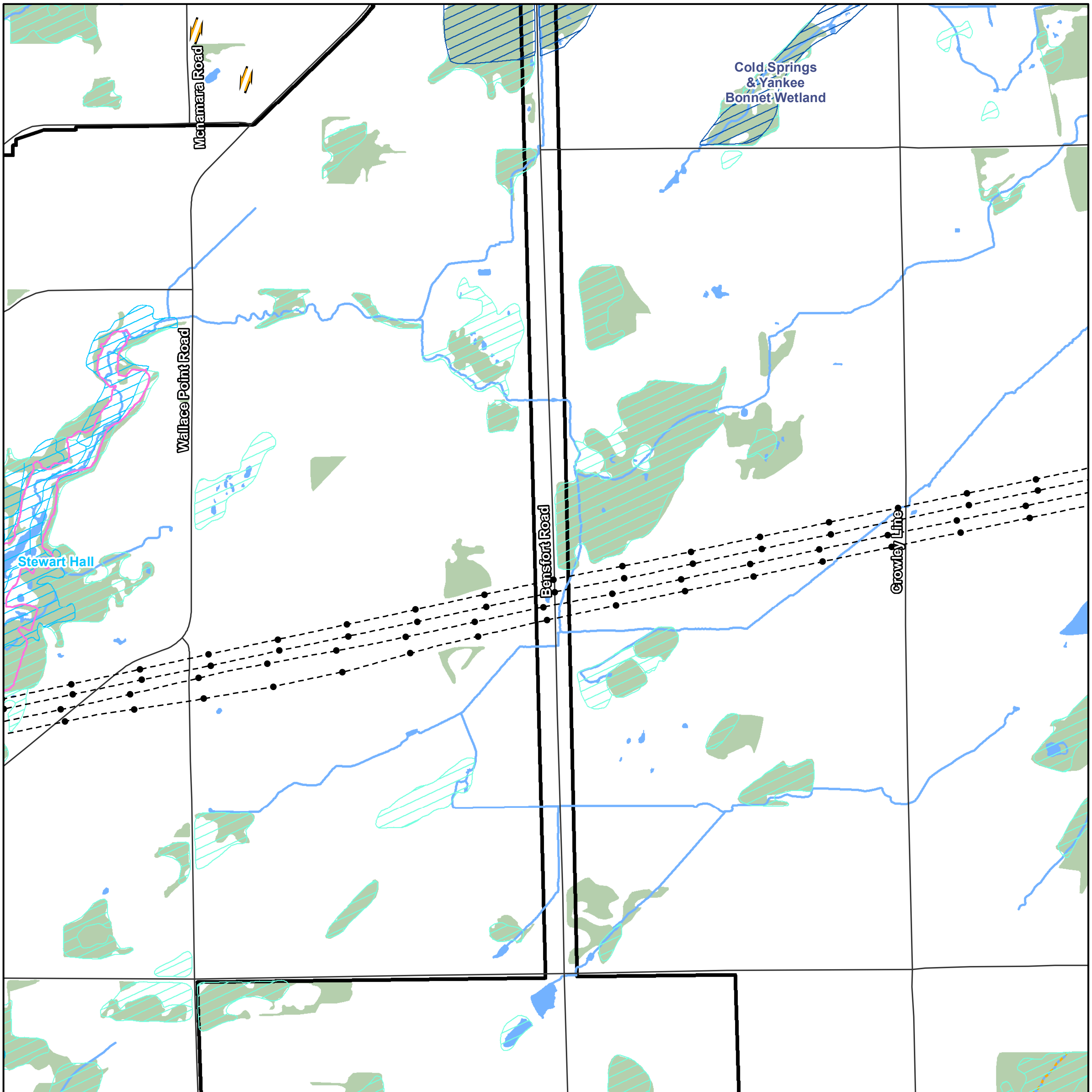

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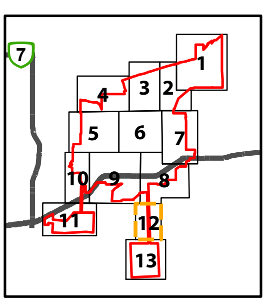

Legend
- Study Area
- Hydro Line
- Road
- Provincially Significant Wetland
- Locally/Other Significant Wetland
- Wetland - Not evaluated per OWES
- Waterbody
- Watercourse
- Watercourse Thermal Regime, Warm
- Floodplain Area (ORCA)
- Woodland (LIO)
- Proximity Linkages

Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.12
Natural Heritage Features

0 200 m
1:20,000

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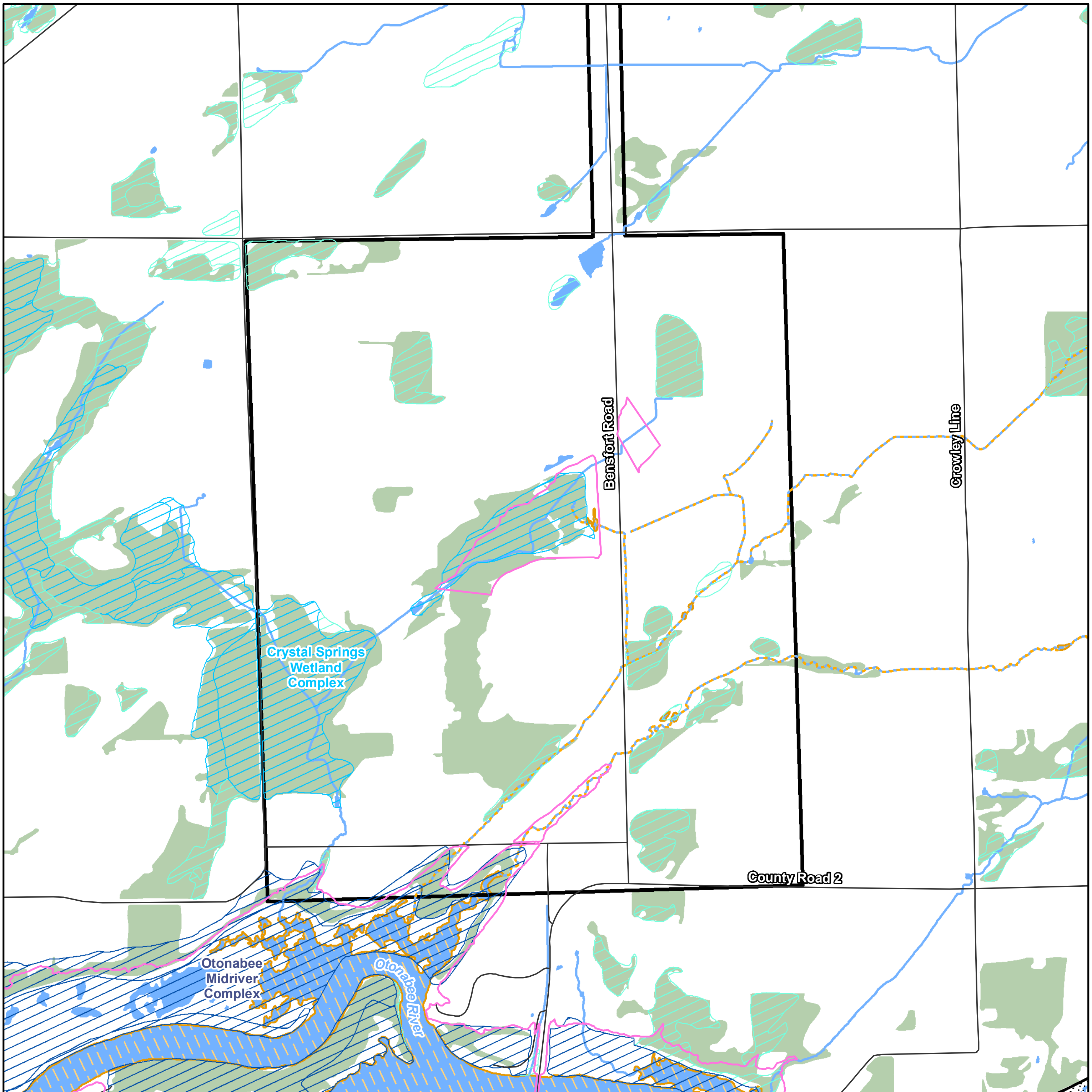

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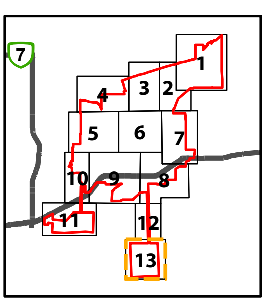

Legend

- Study Area
- Road
- Aggregate Site - Active
- Provincially Significant Wetland
- Locally/Other Significant Wetland
- Wetland - Not evaluated per OWES
- Waterbody
- Watercourse
- Waterbody Thermal Regime, Warm
- Watercourse Thermal Regime, Warm
- Floodplain Area (ORCA)
- Woodland (LIO)

Peterborough Sanitary Master Plan
City of Peterborough

Figure 2.13
Natural Heritage Features

0 200 m

1:20,000

N

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Appendix B – Tables

Table 1: Rare Species Identified Through Background Review

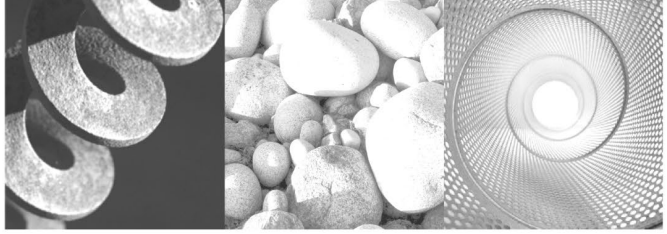
Taxa	Species Name	Scientific Name	ESA Status	S-Rank	Source
Birds	Loggerhead Shrike	*Lanius ludovicianus*	Endangered	S1B	NHIC, Beacon Environmental (2021)
	Red-headed Woodpecker	*Melanerpes erythrocephalus*	Endangered	S3	NHIC, OBBA, eBird
	Bank Swallow	*Riparia riparia*	Threatened	S4B	NHIC, OBBA, iNaturalist, eBird, Beacon Environmental (2021)
	Bobolink	*Dolichonyx oryzivorus*	Threatened	S4B	NHIC, OBBA, eBird, Beacon Environmental (2021)
	Chimney Swift	*Chaetura pelagica*	Threatened	S3B	NHIC, OBBA, eBird, Beacon Environmental (2021)
	Cerulean Warbler	*Setophaga cerulea*	Threatened	S2B	Beacon Environmental (2021)
	Eastern Meadowlark	*Sturnella magna*	Threatened	S4B, S3N	NHIC, OBBA, eBird, Beacon Environmental (2021)
	Least Bittern	*Ixobrychus exilis*	Threatened	S4B	NHIC, OBBA, iNaturalist, Beacon Environmental (2021)
	Lesser Yellowlegs	*Tringa flavipes*	Threatened	S3S4B, S5M	eBird
	Short-eared Owl	*Asio flammeus*	Threatened	S4?B, S2S3N	iNaturalist
	Barn Swallow	*Hirundo rustica*	Special Concern	S4B	NHIC, OBBA, iNaturalist, eBird, Beacon Environmental (2021)
	Canada Warbler	*Cardellina canadensis*	Special Concern	S5B	NHIC, OBBA, iNaturalist, eBird
	Common Nighthawk	*Chordeiles minor*	Special Concern	S4B	NHIC, iNaturalist, eBird
	Eastern Wood-pewee	*Contopus virens*	Special Concern	S4B	NHIC, OBBA, iNaturalist, eBird
	Evening Grosbeak	*Coccothraustes vespertinus*	Special Concern	S4	iNaturalist
	Golden-winged Warbler	*Vermivora chrysoptera*	Special Concern	S3B	NHIC, OBBA, iNaturalist, eBird
	Grasshopper Sparrow	*Ammodramus savannarum*	Special Concern	S4B	NHIC, OBBA, eBird
	Horned Grebe	*Podiceps auritus*	Special Concern	S1B,S3N,S4M	iNaturalist
	Olive-sided Flycatcher	*Contopus cooperi*	Special Concern	S4B	eBird
	Peregrine Falcon	*Falco peregrinus*	Special Concern	S4	iNaturalist
	Wood Thrush	*Hylocichla mustelina*	Special Concern	S4B	NHIC, OBBA, iNaturalist, eBird
	Black Tern	*Chlidonias niger*	Special Concern	S3B,S4M	eBird
	Eastern Whip-poor-will	*Antrostomus vociferus*	Downlisted to Special Concern	S4B	NHIC, eBird, Beacon Environmental (2021)
	Black-crowned Night-heron	*Nycticorax nycticorax*	-	S3B, S2N, S4M	iNaturalist
	American Coot	*Fulica americana*	-	S3B, S4N	eBird
	American Golden-Plover	*Pluvialis dominica*	-	S2B, S4M	eBird
	Blue-winged Teal	*Anas discors*	-	S3B, S4M	NHIC. OBBA, eBird
	Canvasback	*Aythya valisineria*	-	S1B, S3N, S4M	eBird
	Caspian Tern	*Hydroprogne caspia*	-	S3B, S5M	iNaturalist
	Common Gallinule	*Gallinula galeata*	-	S3B	NHIC, OBBA, eBird
	Great Egret	*Ardea alba*	-	S2B, S3M	iNaturalist
	Great Black-backed Gull	*Larus marinus*	-	S1B, S4N	eBird
	Lapland Longspur	*Calcarius lapponicus*	-	S3B, S4N	eBird
	Long-tailed Duck	*Clangula hyemalis*	-	S3B, S5N	iNaturalist
	Pectoral Sandpiper	*Calidris melanotos*	-	S1B, S4M	eBird
	Purple Martin	*Progne subis*	-	S3B	NHIC, eBird
	Red-throated Loon	*Gavia stellata*	-	S2B, S4M	eBird
	Ross's Goose	*Answer rossii*	-	S2B	iNaturalist
	Semipalmated Sandpiper	*Calidris pusilla*	-	S2B, S4M	eBird
	Short-billed Dowitcher	*Limnodromus griseus*	-	S3B, S4M	eBird
	Tundra Swan	*Cygnus columbianus*	-	S2B, S4N, S3M	eBird
	Upland Sandpiper	*Bartramia longicauda*	-	S2B	NHIC, OBBA, eBird
	White-eyed Vireo	*Vireo griseus*	-	S1B	eBird
	Wilson's Phalarope	*Phalaropus tricolor*	-	S2B, S4M	eBird
Insects	Nine-spotted Lady Beetle	*Coccinella novemnotata*	Endangered	S1	NHIC
	Transverse Lady Beetle	*Coccinella transversoguttata*	Endangered	S1	NHIC
	Monarch	*Danaus plexippus*	Special Concern	S2N, S4B	OBA
	American Bumble Bee	*Bombus pensylvanicus*	Uplisted to Special Concern	S3S4	NHIC, iNaturalist
	Yellow-banded Bumble Bee	*Bombus terricola*	Uplisted to Special Concern	S3S5	NHIC
	Acesias Buff Gem	*Heliothis acesias*	-	S2S3	iNaturalist
	Alternate Cuckoo Leafcutter Bee	*Coelioxys alternatus*	-	S3	iNaturalist
	Angle-lined Prominent Moth	*Clostera inclusa*	-	S2S3	OBA
	Black Zale Moth	*Zale undularis*	-	S3	iNaturalist
	Brown Panopoda Moth	*Panopoda carneicosta*	-	S3	iNaturalist
	Brown Scoopwing Moth	*Calledapteryx dryopterata*	-	S3S4	NHIC
	Carolina Sphinx Moth	*Manduca sexta*	-	S2	OBA
	Chestnut Schizura Moth	*Schizura badia*	-	S3	OBA
	Columbia Silkmoth	*Hyalophora columbia*	-	S3	OBA
	Common Fungus Moth	*Metalectra discalis*	-	S3	iNaturalist
	Early Hairstreak	*Erora laeta*	-	S2	iNaturalist
	Faint-spotted Palthis Moth	*Palthis asopialis*	-	S3S4	iNaturalist

Table 1: Rare Species Identified Through Background Review

Taxa	Species Name	Scientific Name	ESA Status	S-Rank	Source
	Fine-lined Sallow Moth	*Catabena lineolata*	-	S3	iNaturalist
	Forgotten Frigid Owlet Moth	*Nycteola metaspilella*	-	S3	iNatualist
	Fraternal Potter Wasp	*Eumenes fraternus*	-	S3	iNatualist
	Gold-spotted Ghost Moth	*Sthenopis pretiosus*	-	S3	OBA
	Golden Northern Bumble Bee	*Bombus fervidus*	-	S3S4	iNaturalist
	Glorious Habrosyne Moth	*Habrosyne gloriosa*	-	S3S4	NHIC
	Harlequin Darner	*Gomphaeschna furcillata*	-	S3S4	iNaturalist
	Hermit Sphinx	*Lintneria eremitus*	-	S3	OBA
	Hoary Long-horned Bee	*Peponapis pruinosa*	-	S2S3	iNaturalist
	Hooded Pygmy Grasshopper	*Paratettix cucullatus*	-	S3	iNaturalist
	Juniper Hairstreak	*Callophrys gryneus*	-	S3	OBA
	Larger Boxelder Leafroller Moth	*Archips negundana*	-	S3	iNaturalist
	Lettered Zanclognatha Moth	*Zanclognatha lituralis*	-	S3S4	NHIC
	Little Underwing Moth	*Catocala minuta*	-	S3	OBA
	Locust Underwing Moth	*Euparthenos nubilis*		S3S4	NHIC
	Lynx Flower Moth	*Schinia lynx*	-	S2S3	iNaturalist
	Meske's Underwing Moth	*Catocala meskei*	-	S3S4	OBA
	Neighbor Moth	*Haploa contigua*	-	S3S4	OBA
	Northern Bush Katydid	*Scudderia septentrionalis*	-	S3?	NHIC
	Pawpaw Sphinx	*Dolba hyloeus*	-	S3S4	OBA
	Pink-legged Tiger Moth	*Spilosoma latipennis*	-	S3S4	OBA
	Praeclara Underwing Moth	*Catocala praeclara*	-	S3S4	OBA
	Penitent Underwing Moth	*Catocala piatrix*	-	S3	iNaturalist
	Proghorn Clubtail	*Phanogomphus graslinellus*	-	S3	iNaturalist
	Obelisk Dart Moth	*Euxoa obeliscoides*	-	S3S4	NHIC
	Owl-eyed Bird-dropping Moth	*Cerma cora*	-	S3S4	NHIC
	Orange Holomelina Moth	*Virbia aurantiaca*	-	S3S4	NHIC, OBA
	Red-chested Cuckoo Nomad Bee	*Epeolus scutellaris*	-	S3	NHIC
	Red Sedge Borer	*Globia laeta*	-	S3S4	NHIC
	Shiny Bog Fly	*Parhelophilus integer*	-	S2	iNaturalist
	Sugar Maple Borer	*Glycobius speciosus*	-	S3	iNaturalist
	Speckled Giant Lacewing	*Polystoechotes punctata*	-	SH	NHIC
	Spotted Phosphila Moth	*Phosphila miselioides*	-	S2S3	iNaturalist
	Swamp Darner	*Epiaeschna heros*	-	S3S4	NHIC
	Thinker Moth	*Lacinipolia meditata*	-	S3S4	NHIC
	Unsated Sallow Moth	*Metaxaglaea inulta*	-	S3S4	NHIC
	Widow Jacket	*Vespula vidua*	-	S3	iNaturalist
	Walnut Caterpillar Moth	*Datana integerrima*	-	S3S4	NHIC
	White-lined Sphinx Moth	*Hyles lineata*	-	S2B, S4M	iNaturalist
	Yellow-lined Owlet Moth	*Colobochyla interpuncta*	-	S3	iNaturalist
	One-banded Mason Wasp	*Ancistrocerus unifasciatus*	-	S3	NHIC, iNaturalist
	Smiling Mason Wasp	*Ancistrocerus campestris*	-	S1	NHIC, iNaturalist
Fish	Lake Sturgeon	*Acipenser fulvescens (pop 3)*	Threatened	S2	NHIC
	Northern Sunfish	*Lepomis peltastes*	Special Concern	S3	DFO Aquatic SAR Mapping
	Greater Redhorse	*Moxostoma valenciennesi*	-	S3	NHIC
Reptiles/ Amphibians	Spotted Turtle	*Clemmys guttata*	Endangered	S2	Beacon Environmental (2021)
	Blanding's Turtle	*Emydoidea blandingii*	Threatened	S3	NHIC, ORRA, Beacon Environmental (2021)
	Eastern Hognose Snake	*Heterodon platirhinos*	Threatened	S3	Beacon Environmental (2021)
	Common five-lined Skink	*Plestiodon fasciatus (pop 2)*	Special Concern	S3	NHIC, ORRA
	Eastern Musk Turtle	*Sternotherus odoratus*	Special Concern	S3	NHIC, ORRA
	Northern Map Turtle	*Graptemys geographica*	Special Concern	S3	NHIC, ORRA, iNaturalist
	Snapping Turtle	*Chelydra serpentina*	Special Concern	S4B	NHIC, ORAA, iNaturalist
Mammals	Northern Myotis	*Myotis septentrionalis*	Endangered	S3	Beacon Environmental (2021)
	Eastern Small-footed	*Myotis Myotis leibii*	Endangered	S2S3	Beacon Environmental (2021)
	Little Brown Myotis	*Myotis lucifugus*	Endangered	S3	Beacon Environmental (2021)
	Tri-colored Bat	*Perimyotis subflavus*	Endangered	S3?	Beacon Environmental (2021)
	Eastern Red Bat	*Lasiurus borealis*	Endangered	S4	
	Hoary Bat	*Lasiurus cinereus*	Endangered	S4	
	Silver-haired Bat	*Lasionycteris noctivagans*	Endangered	S4	
Plants	American Chestnut	*Castanea dentata*	Endangered	S1S2	NHIC
	Wood Poppy	*Stylophorum diphyllum*	Endangered	S1	iNaturalist
	Black Ash	Fraxinus Nigra	Endangered	S4	NHIC
	Butternut	Juglans cinerea	Endangered	S2?	NHIC, Beacon Environmental (2021)
	Crooked-stem Aster	Symphyotrichum prenanthoides	Special Concern	S2?	NHIC, iNaturalist

Table 1: Rare Species Identified Through Background Review

Taxa	Species Name	Scientific Name	ESA Status	S-Rank	Source
	Culver's Root	*Veronicastrum virginicum*	-	S2	iNaturalist
	Cup Plant	*Silphium perfoliatum*	-	S2	NHIC, iNaturalist
	Grey-headed Prairie Coneflower	*Ratibida pinnata*	-	S3	NHIC, iNaturalist
	Ohio Buckeye	*Aesculus glabra*	-	S1	iNaturalist
	Saltmarsh Sand-spurrey	*Spergularia marina*	-	S1	NHIC, iNaturalist
	Side-oats Grama	*Bouteloua curtipendula*	-	S2	NHIC, iNaturalist
	Virginia Bluebells	*Mertensia virginica*	-	S3	iNaturalist
	Winged Loosestrife	*Lythrum alatum*	-	S3	NHIC



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City of Peterborough Sanitary Master Plan

VOLUME 2*:* APPENDIX A2

Cultural Heritage Screening Report

Prepared by:
GEI Consultants Canada

April 2025

The City of Peterborough is committed to ensuring that all City services, programs, and facilities are inclusive and accessible. Please contact the Project Team if you need any accommodations to provide comments and/or feedback for this Study.

PROJECT REFERENCE: 2023-0166

November 6, 2023

WWW.PHCGROUP.CA

Parslow Heritage Consultancy Inc.

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GM BluePlan Engineering Limited c/o Sandra Anastasio

3300 Highway 7, Suite 402, Vaughan ON, L4K 4M3

Cultural Heritage Screening Report, City of Peterborough Sanitary Master Plan, Environmental Assessment, City of Peterborough, Ontario

Introduction

Parslow Heritage Consultancy Inc. (PHC Inc.) was retained by GM BluePlan Engineering Limited to prepare a Cultural Heritage Screening Report (CHSR) in support of the City of Peterborough Sanitary Master Plan Environmental Assessment (EA).

The study area encompasses approximately 6,000 ha (14,827 ac), as illustrated in mapping provided in Appendix C. The CHSR considered known heritage resources and properties immediately adjacent to the study area. The study area is situated around the valley of the Otonabee River, intermingled with rolling hills and the Peterborough drumlin fields, located within the City of Peterborough, The Township of Cavan Monaghan and the Township of Otonabee South Monaghan.

The purpose of this undertaking is to complete a CHSR in accordance with the Ontario Heritage Act and the Ministry of Citizenship and Multiculturalism's (formerly Ministry of Tourism, Culture and Sport) *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (2016) (the Checklist). The main objectives of the CHSR are to gather information about the presence and significance of cultural heritage resources within and/or adjacent to the study area and determine if further field investigation will be required.

Various sources of information were consulted to assist with completion of the checklist and to assess the heritage potential of adjacent properties. These sources of information include:

- Historic atlas' and maps
- Aerial imagery

- Internet sources
- Municipal heritage register (City of Peterborough)
- Provincial heritage sources (MCM & OHT)
- Parks Canada Directory of Federal Heritage Designations

Checklist Results

The Checklist (Appendix B), attached as part of this CHSR, has three parts: screening for known cultural heritage resources; screening for potential heritage resources; and, other considerations, such as Indigenous land use.

Screening for Known Cultural Heritage Resources

In reviewing the municipal heritage registers for the City of Peterborough, it was determined that multiple known heritage resources are located within the City of Peterborough including Listed Properties, Designated properties, a Heritage Conservation District (HCD) and multiple cemeteries and known burial sites. The Township of Cavan Monaghan and the Township of Otonabee South Monaghan did not identify any heritage resources associated within or in proximity to the Peterborough Airport or Peterborough City Dump, both of which are located within the study area. Appendix C provides mapping that depicts the location of known heritage resources within and adjacent to the extent of the study area. The study area also contains the Peterborough Lift Lock National Historic Site of Canada, the Trent-Severn Waterway National Historic Site and the Peterborough Drill Hall/Armory National Historic Site.

Screening for Potential Heritage Resources

During review of available data for the study area to screen for potential heritage resources, it was determined the study area:

- Contains known burial sites and/or cemeteries,
- Contains part of the Peterborough Drumlin field
- Contains multiple identified properties of heritage value
- Contains federally recognized heritage properties
- Is comprised of lands with significant cultural and spiritual value to multiple First Nations

A desktop review identified numerous additional properties of potential heritage value. Given the size of the study area it is not practical to identify all properties that may exhibit potential

heritage value in the CHSR, without mapping to illustrate areas requiring sanitary system upgrades.

According to the Cultural Heritage Checklist (Appendix B):

> *If Yes to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.*
>
> *You need to hire a qualified person(s) to undertake:*
>
> - *a Cultural Heritage Evaluation Report (CHER)*
>
> *If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:*
>
> - *a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts*

The study area contains multiple known heritage properties and multiple unrecognized properties of potential heritage value. The Avenues and Neighborhood HCD is located within the study area, between Monaghan Road, Charlotte Street, Park Street North and Sherbrooke Street in the downtown core of the City of Peterborough.

Indigenous Land Use

In reviewing the criteria to consider other information in determining cultural heritage value or interest, it is acknowledged the study area is the traditional territory of and of cultural interest and value to numerous Indigenous First Nations communities, namely, the Williams Treaties communities and the Nation Huronne-Wendat. A Stage 1 archaeological assessment is currently being undertaken as part of the EA process which will address the archaeological cultural heritage of the study area in accordance with Provincial standards as stipulated by the MCM.

Existing Conditions

The study area encompasses the extent of the City of Peterborough as well as two free standing parcels of land south of the city proper, located in the Township of Cavan Monaghan and the Township of Otonabee South Monaghan; one containing the Peterborough Airport and the second the Peterborough Landfill. Colonial-era European settlement of the study area commenced in 1825 and as such the study area has an extensive Colonial history that is well represented by European built structures. The study area is situated around the valley of the Otonabee Rive, intermingled with rolling hills and the Peterborough drumlin fields.

Community Consultation

Community Consultation has commenced, including the posting of a Public Notice of Study Commencement and transmittal of a Project Notification Letter to Indigenous Communities who may have an interest in the EA. Both the Public Notice of Study Commencement and the Project Notification Letters were distributed by the City of Peterborough and GM BluePlan Engineering Limited, who are undertaking Indigenous consultation for the EA. Any feedback or comments received related to the CHSR will be incorporated into the final CHSR, or when the CHSR is updated at a later date. To date, the Nation Huronne-Wendat and Alderville First Nation have requested to review the draft CHSR.

Summary and Preliminary Comments on Potential Impacts

Based on the results of the CHSR, primarily the Checklist in Appendix B and mapping provided in Appendix C, it is determined the study area contains a substantial number of properties that exhibit cultural heritage value or interest represented by a mix of Listed properties, Designated properties, a HCD, and a number of known cemeteries and Indigenous burial sites. In addition to the currently documented heritage properties the study area contains numerous undocumented properties of potential cultural heritage value.

Based on evaluation of the study area against the 'Cultural Heritage Checklist', a Cultural Heritage Evaluation Report (CHER) will need to be undertaken once a defined area of impact is established. However, it is first recommended the CHSR be revised once a defined area of impact is established, to determine properties that would be included in the CHER. The CHER would be undertaken for Listed properties and properties of potential heritage value within or adjacent to an area of impact. A Heritage Impact Assessment (HIA) would be required for any Designated properties and the HCD, within or adjacent to an area of impact.

Recommendations

1. In keeping with the Cultural Heritage Checklist (Appendix B), a CHER is recommended for Listed properties and properties of potential heritage value within or adjacent to an area to impacted by sanitary system upgrades; the number of properties requiring a CHER will be determined upon updating of the CHSR once areas of impact are identified.
2. In keeping with the Cultural Heritage Checklist (Appendix B), a Heritage Impact Assessment (HIA) is recommended for Designated properties and the HCD, should these properties be within or adjacent to the area of impact; the number of properties requiring a HIA will be determined upon updating of the CHSR once areas of impact are identified.

3. Should all ground disturbance be confined to existing established municipal road right-of-ways the potential for impact to heritage resources, both known and unknown, is deemed to be low.
4. The finalized route should be subject to a pre-construction vibration assessment, and subsequent vibration monitoring during construction.

Sincerely,

Chris Lemon B.Sc., Dip Heritage, CAHP,

Cultural Heritage Specialist

Appendix A

Qualifications

Senior Heritage Specialist – Carla Parslow, PhD, CAHP Member in Good Standing: Dr. Carla Parslow has over 20 years of experience in the cultural heritage resource management (CHRM) industry in Canada. As the President of PHC Inc., Dr. Parslow is responsible for the for the management of CHRM projects, as well as the technical review and quality assurance of all archaeological and cultural heritage projects completed by PHC. Throughout her career, Carla has managed both large and small offices of CHRM professionals and has mobilized both large (50+) and small (4+) teams of CHRM and Environmental projects offices throughout the province of Ontario. Dr. Parslow has served as either Project Manager or Project Director on hundreds of Archaeological and Cultural Heritage Assessments. Dr. Parslow is a professional member of the Canadian Association of Heritage Professionals (CAHP).

Dr. Parslow is also responsible for the overall quality assurance.

Heritage Specialist – Chris Lemon, B.Sc., Dip. CAHP Member in Good Standing: Chris Lemon is a Cultural Heritage Specialist and Licensed Archaeologist (R289) with 15 years' experience. He received an Honours B.Sc. in Anthropology from the University of Toronto and has completed course work towards an M.A. from the University of Western Ontario. Mr. Lemon has a Diploma in Heritage Carpentry and Joinery and a Certificate in Heritage Planning from Algonquin College. During his career Mr. Lemon has participated in cultural heritage assessments across Ontario as both a Senior Field Director in archaeology and as a Built Heritage Practitioner. Chris's previous experience includes representation on Joint Health and Safety Committees; he is dedicated to maintaining a safety-first focus on all job sites. Chris is a professional member of the Canadian Association of Heritage Professionals (CAHP).

Mr. Lemon is responsible for research, reporting and analysis.

Appendix B

CHSR Checklist

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area:
    - is a recognized heritage property
    - may be of cultural heritage value
- it includes all areas that may be impacted by project activities, including – but not limited to:
    - the main project area
    - temporary storage
    - staging and working areas
    - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Cultural Heritage Evaluation Report (CHER)

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a qualified person(s) (see page 5 for definitions) to undertake a cultural heritage evaluation report (CHER).

The CHER will help you:

- identify, evaluate and protect cultural heritage resources on your property or project area
- reduce potential delays and risks to a project

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages for more detailed information and when completing this form.

Project or Property Name

City of Peterborough Sanitary Master Plan

Project or Property Location (upper and lower or single tier municipality)

City of Peterborough and Township of Cavan Monaghan and Township of Otonabee South Monaghan

Proponent Name

GM BluePlan Engineering Limited

Proponent Contact Information

Sandra Anastasio 3300 Highway 7, Suite 402, Vaughan ON, L4K 4M3

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

Part A: Screening for known (or recognized) Cultural Heritage Value

	Yes	No
2. Has the property (or project area) been evaluated before and found **not** to be of cultural heritage value?	☐	☑

If Yes, do **not** complete the rest of the checklist.

The proponent, property owner and/or approval authority will:

- summarize the previous evaluation and
- add this checklist to the project file, with the appropriate documents that demonstrate a cultural heritage evaluation was undertaken

The summary and appropriate documentation may be:

- submitted as part of a report requirement
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Is the property (or project area):		
a. identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value?	☑	☐
b. a National Historic Site (or part of)?	☑	☐
c. designated under the *Heritage Railway Stations Protection Act*?	☐	☑
d. designated under the *Heritage Lighthouse Protection Act*?	☐	☑
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?	☑	☐
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	☐	☑

If Yes to any of the above questions, you need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report, if a Statement of Cultural Heritage Value has not previously been prepared or the statement needs to be updated

If a Statement of Cultural Heritage Value has been prepared previously and if alterations or development are proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No, continue to Question 4.

Part B: Screening for Potential Cultural Heritage Value

	Yes	No
4. Does the property (or project area) contain a parcel of land that:		
a. is the subject of a municipal, provincial or federal commemorative or interpretive plaque?	☑	☐
b. has or is adjacent to a known burial site and/or cemetery?	☑	☐
c. is in a Canadian Heritage River watershed?	☐	☑
d. contains buildings or structures that are 40 or more years old?	☑	☐

Part C: Other Considerations

	Yes	No
5. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area):		
a. is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?	☑	☐
b. has a special association with a community, person or historical event?	☑	☐
c. contains or is part of a cultural heritage landscape?	☑	☐

If Yes to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.

You need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report (CHER)

If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No to all of the above questions, there is low potential for built heritage or cultural heritage landscape on the property.

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g. under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

For more information, see the Ministry of Tourism, Culture and Sport's Ontario Heritage Toolkit or Standards and Guidelines for Conservation of Provincial Heritage Properties.

In this context, the following definitions apply:

- **qualified person(s)** means individuals – professional engineers, architects, archaeologists, etc. – having relevant, recent experience in the conservation of cultural heritage resources.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may already be in place for identifying potential cultural heritage resources, including:

- one endorsed by a municipality
- an environmental assessment process e.g. screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport (MTCS) under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s.B.2.]

Part A: Screening for known (or recognized) Cultural Heritage Value

2. Has the property (or project area) been evaluated before and found not to be of cultural heritage value?

Respond 'yes' to this question, if all of the following are true:

A property can be considered not to be of cultural heritage value if:

- a Cultural Heritage Evaluation Report (CHER) - or equivalent - has been prepared for the property with the advice of a qualified person and it has been determined not to be of cultural heritage value and/or
- the municipal heritage committee has evaluated the property for its cultural heritage value or interest and determined that the property is not of cultural heritage value or interest

A property may need to be re-evaluated, if:

- there is evidence that its heritage attributes may have changed
- new information is available
- the existing Statement of Cultural Heritage Value does not provide the information necessary to manage the property
- the evaluation took place after 2005 and did not use the criteria in Regulations 9/06 and 10/06

Note: Ontario government ministries and public bodies [prescribed under Regulation 157/10] may continue to use their existing evaluation processes, until the evaluation process required under section B.2 of the Standards & Guidelines for Conservation of Provincial Heritage Properties has been developed and approved by MTCS.

To determine if your property or project area has been evaluated, contact:

- the approval authority
- the proponent
- the Ministry of Tourism, Culture and Sport

3a. Is the property (or project area) identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value e.g.:

i. designated under the *Ontario Heritage Act*

- individual designation (Part IV)
- part of a heritage conservation district (Part V)

Individual Designation – Part IV

A property that is designated:

- by a municipal by-law as being of cultural heritage value or interest [s.29 of the *Ontario Heritage Act*]
- by order of the Minister of Tourism, Culture and Sport as being of cultural heritage value or interest of provincial significance [s.34.5]. **Note**: To date, no properties have been designated by the Minister.

Heritage Conservation District – Part V

A property or project area that is located within an area designated by a municipal by-law as a heritage conservation district [s. 41 of the *Ontario Heritage Act*].

For more information on Parts IV and V, contact:

- municipal clerk
- Ontario Heritage Trust
- local land registry office (for a title search)

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ii. subject of an agreement, covenant or easement entered into under Parts II or IV of the *Ontario Heritage Act*

An agreement, covenant or easement is usually between the owner of a property and a conservation body or level of government. It is usually registered on title.

The primary purpose of the agreement is to:

- preserve, conserve, and maintain a cultural heritage resource
- prevent its destruction, demolition or loss

For more information, contact:

- Ontario Heritage Trust - for an agreement, covenant or easement [clause 10 (1) (c) of the *Ontario Heritage Act*]
- municipal clerk – for a property that is the subject of an easement or a covenant [s.37 of the *Ontario Heritage Act*]
- local land registry office (for a title search)

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iii. listed on a register of heritage properties maintained by the municipality

Municipal registers are the official lists - or record - of cultural heritage properties identified as being important to the community.

Registers include:

- all properties that are designated under the *Ontario Heritage Act* (Part IV or V)
- properties that have not been formally designated, but have been identified as having cultural heritage value or interest to the community

For more information, contact:

- municipal clerk
- municipal heritage planning staff
- municipal heritage committee

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iv. subject to a notice of:

- intention to designate (under Part IV of the *Ontario Heritage Act*)
- a Heritage Conservation District study area bylaw (under Part V of the *Ontario Heritage Act*)

A property that is subject to a **notice of intention to designate** as a property of cultural heritage value or interest and the notice is in accordance with:

- section 29 of the *Ontario Heritage Act*
- section 34.6 of the *Ontario Heritage Act.* **Note**: To date, the only applicable property is Meldrum Bay Inn, Manitoulin Island. [s.34.6]

An area designated by a municipal by-law made under section 40.1 of the *Ontario Heritage Act* as a **heritage conservation district study area**.

For more information, contact:

- municipal clerk – for a property that is the subject of notice of intention [s. 29 and s. 40.1]
- Ontario Heritage Trust

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v. included in the Ministry of Tourism, Culture and Sport's list of provincial heritage properties

Provincial heritage properties are properties the Government of Ontario owns or controls that have cultural heritage value or interest.

The Ministry of Tourism, Culture and Sport (MTCS) maintains a list of all provincial heritage properties based on information provided by ministries and prescribed public bodies. As they are identified, MTCS adds properties to the list of provincial heritage properties.

For more information, contact the MTCS Registrar at registrar@ontario.ca.

3b. Is the property (or project area) a National Historic Site (or part of)?

National Historic Sites are properties or districts of national historic significance that are designated by the Federal Minister of the Environment, under the *Canada National Parks Act*, based on the advice of the Historic Sites and Monuments Board of Canada.

For more information, see the National Historic Sites website.

3c. Is the property (or project area) designated under the *Heritage Railway Stations Protection Act*?

The *Heritage Railway Stations Protection Act* protects heritage railway stations that are owned by a railway company under federal jurisdiction. Designated railway stations that pass from federal ownership may continue to have cultural heritage value.

For more information, see the Directory of Designated Heritage Railway Stations.

3d. Is the property (or project area) designated under the *Heritage Lighthouse Protection Act*?

The *Heritage Lighthouse Protection Act* helps preserve historically significant Canadian lighthouses. The Act sets up a public nomination process and includes heritage building conservation standards for lighthouses which are officially designated.

For more information, see the Heritage Lighthouses of Canada website.

3e. Is the property (or project area) identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office?

The role of the Federal Heritage Buildings Review Office (FHBRO) is to help the federal government protect the heritage buildings it owns. The policy applies to all federal government departments that administer real property, but not to federal Crown Corporations.

For more information, contact the Federal Heritage Buildings Review Office.

See a directory of all federal heritage designations.

3f. Is the property (or project area) located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?

A UNESCO World Heritage Site is a place listed by UNESCO as having outstanding universal value to humanity under the Convention Concerning the Protection of the World Cultural and Natural Heritage. In order to retain the status of a World Heritage Site, each site must maintain its character defining features.

Currently, the Rideau Canal is the only World Heritage Site in Ontario.

For more information, see Parks Canada – World Heritage Site website.

Part B: Screening for potential Cultural Heritage Value

4a. Does the property (or project area) contain a parcel of land that has a municipal, provincial or federal commemorative or interpretive plaque?

Heritage resources are often recognized with formal plaques or markers.

Plaques are prepared by:

- municipalities
- provincial ministries or agencies
- federal ministries or agencies
- local non-government or non-profit organizations

For more information, contact:

- municipal heritage committees or local heritage organizations – for information on the location of plaques in their community
- Ontario Historical Society's Heritage directory – for a list of historical societies and heritage organizations
- Ontario Heritage Trust – for a list of plaques commemorating Ontario's history
- Historic Sites and Monuments Board of Canada – for a list of plaques commemorating Canada's history

4b. Does the property (or project area) contain a parcel of land that has or is adjacent to a known burial site and/or cemetery?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulations, Ontario Ministry of Consumer Services – for a database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, adjacent means contiguous or as otherwise defined in a municipal official plan.

4c. Does the property (or project area) contain a parcel of land that is in a Canadian Heritage River watershed?

The Canadian Heritage River System is a national river conservation program that promotes, protects and enhances the best examples of Canada's river heritage.

Canadian Heritage Rivers must have, and maintain, outstanding natural, cultural and/or recreational values, and a high level of public support.

For more information, contact the Canadian Heritage River System.

If you have questions regarding the boundaries of a watershed, please contact:

- your conservation authority
- municipal staff

4d. Does the property (or project area) contain a parcel of land that contains buildings or structures that are 40 or more years old?

A 40 year 'rule of thumb' is typically used to indicate the potential of a site to be of cultural heritage value. The approximate age of buildings and/or structures may be estimated based on:

- history of the development of the area
- fire insurance maps
- architectural style
- building methods

Property owners may have information on the age of any buildings or structures on their property. The municipality, local land registry office or library may also have background information on the property.

Note: 40+ year old buildings or structure do not necessarily hold cultural heritage value or interest; their age simply indicates a higher potential.

A building or structure can include:

- residential structure
- farm building or outbuilding
- industrial, commercial, or institutional building
- remnant or ruin
- engineering work such as a bridge, canal, dams, etc.

For more information on researching the age of buildings or properties, see the Ontario Heritage Tool Kit Guide Heritage Property Evaluation.

Part C: Other Considerations

5a. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) is considered a landmark in the local community or contains any structures or sites that are important to defining the character of the area?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has potential landmarks or defining structures and sites, for instance:

- buildings or landscape features accessible to the public or readily noticeable and widely known
- complexes of buildings
- monuments
- ruins

5b. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) has a special association with a community, person or historical event?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has a special association with a community, person or event of historic interest, for instance:

- Aboriginal sacred site
- traditional-use area
- battlefield
- birthplace of an individual of importance to the community

5c. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) contains or is part of a cultural heritage landscape?

Landscapes (which may include a combination of archaeological resources, built heritage resources and landscape elements) may be of cultural heritage value or interest to a community.

For example, an Aboriginal trail, historic road or rail corridor may have been established as a key transportation or trade route and may have been important to the early settlement of an area. Parks, designed gardens or unique landforms such as waterfalls, rock faces, caverns, or mounds are areas that may have connections to a particular event, group or belief.

For more information on Questions 5.a., 5.b. and 5.c., contact:

- Elders in Aboriginal Communities or community researchers who may have information on potential cultural heritage resources. Please note that Aboriginal traditional knowledge may be considered sensitive.
- municipal heritage committees or local heritage organizations
- Ontario Historical Society's "Heritage Directory" - for a list of historical societies and heritage organizations in the province

An internet search may find helpful resources, including:

- historical maps
- historical walking tours
- municipal heritage management plans
- cultural heritage landscape studies
- municipal cultural plans

Information specific to trails may be obtained through Ontario Trails.

Appendix C

Mapping

Existing Infrastructure

- Sanitary Pump Station
- Pressurized Sewer Main
- Trunk Sewer Main
- Gravity Main

General Features

- Study Area
- Waterbody and Watercourses
- Park
- Woodland
- Municipal Boundary

0 1 2 km

Chemong Lake

Otonabee River

Little Lake

Parkhill_west

Valleyview

Parkhill_east

Simcoe_street

Engleburn

Burnham_point

Ashburnham

Montgomery

Park_street

Monaghan

Airport

Landfill

Brealey Drive

Lansdowne Street

Parkhill Road

Airport Road

Benston Road

115

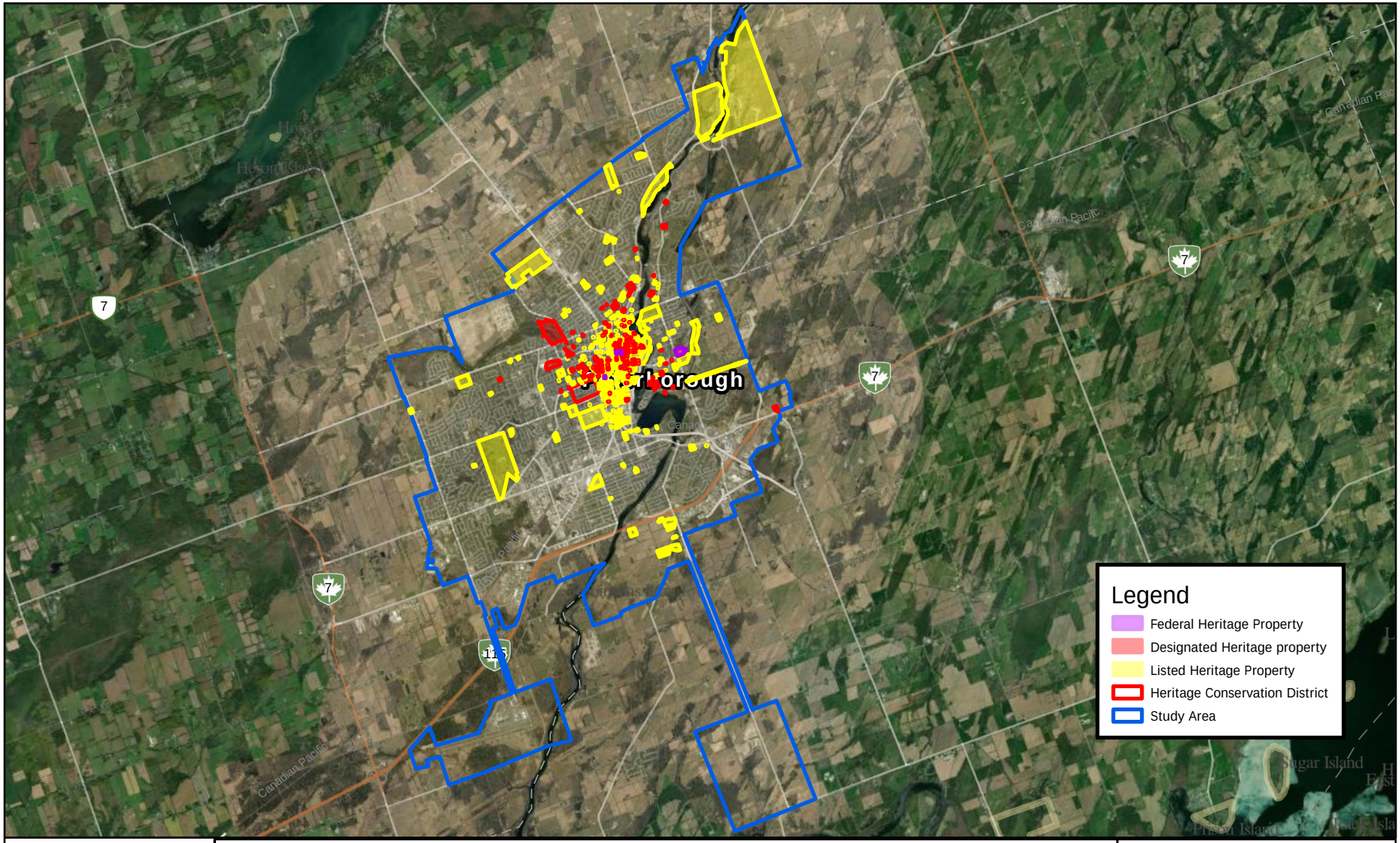
Existing Sanitary Infrastructure

Sanitary Master Plan

peterborough
outside the ordinary

BluePlan ENGINEERING

August, 2023
723034-WW-001
Projection EPSG:2958



Peterborough Sanity Wastewater Master Plan

Map 1: Overview Map

City of Peterborough, Earthstar Geographics

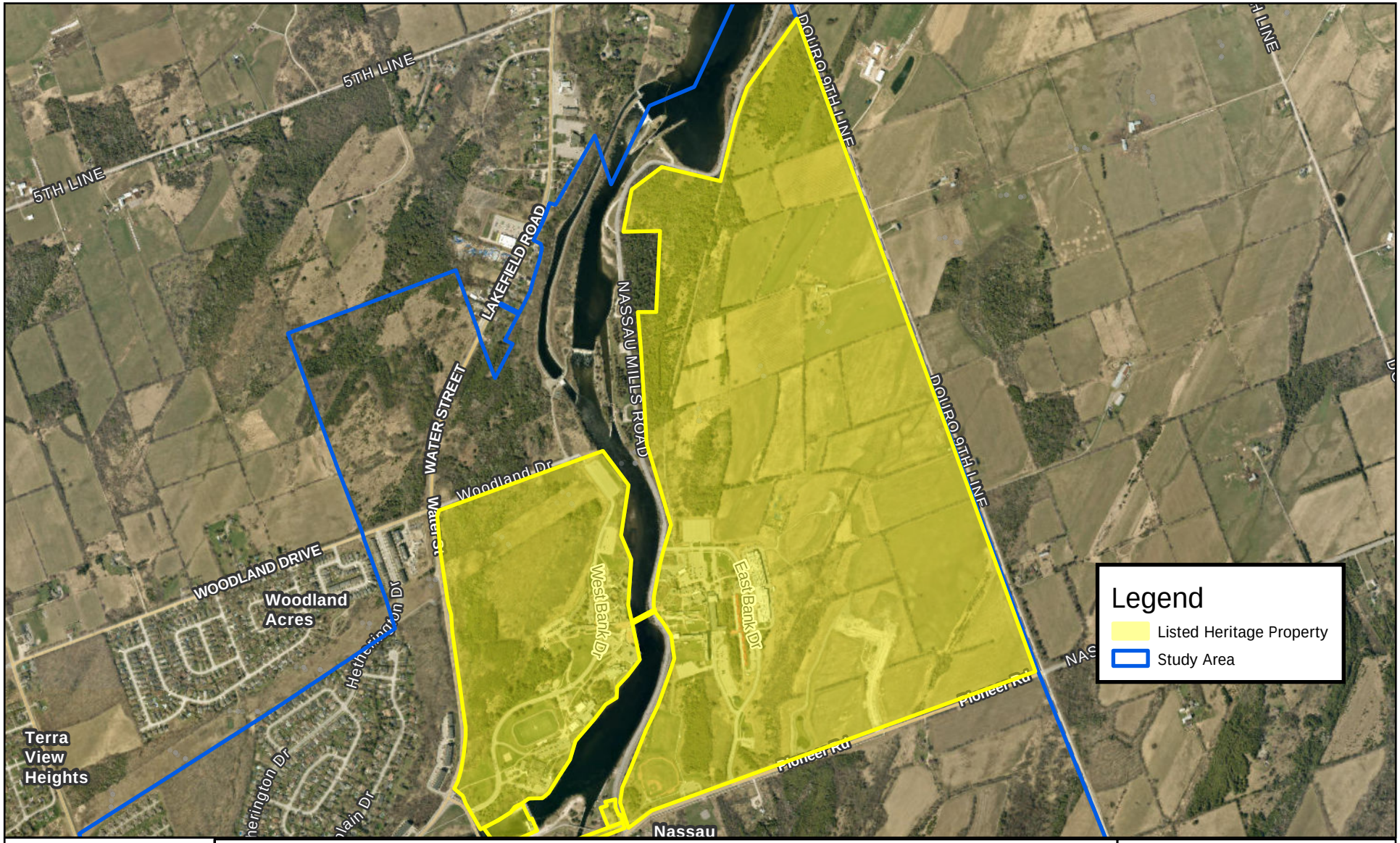
Coordinate System: NAD 1983 UTM Zone 17N

N

Scale 1:125,000

0 2,000 4,000 Meters

0 2.25 4.5 Km



Peterborough Sanity Wastewater Master Plan

Map 2: Key Map #1

City of Peterborough, Maxar

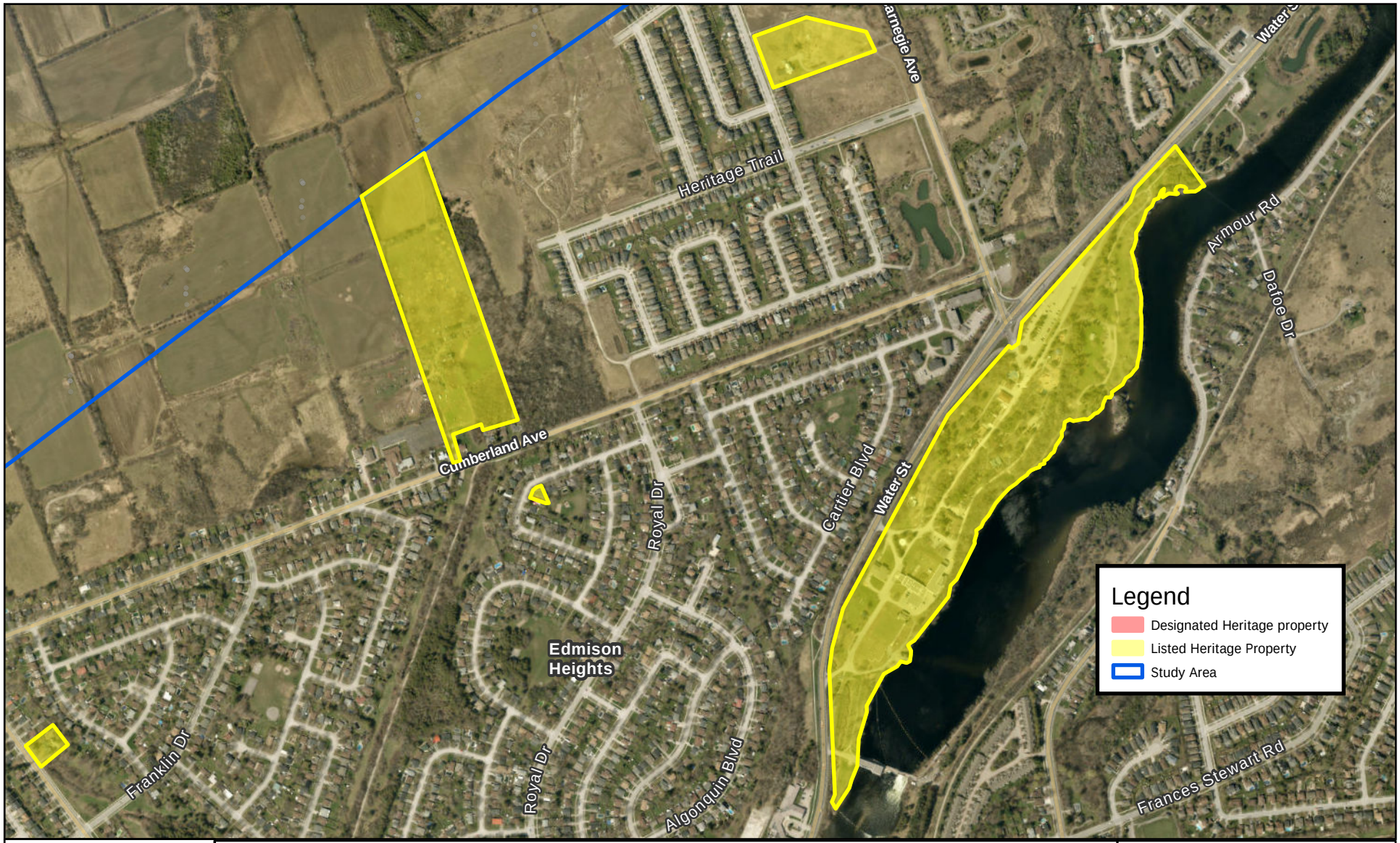
Coordinate System: NAD 1983 UTM Zone 17N

N

Scale 1:18,000

0 320 640 Meters

0 0.33 0.65 Km



Peterborough Sanity Wastewater Master Plan

Map 3: Key Map #2

City of Peterborough, Maxar

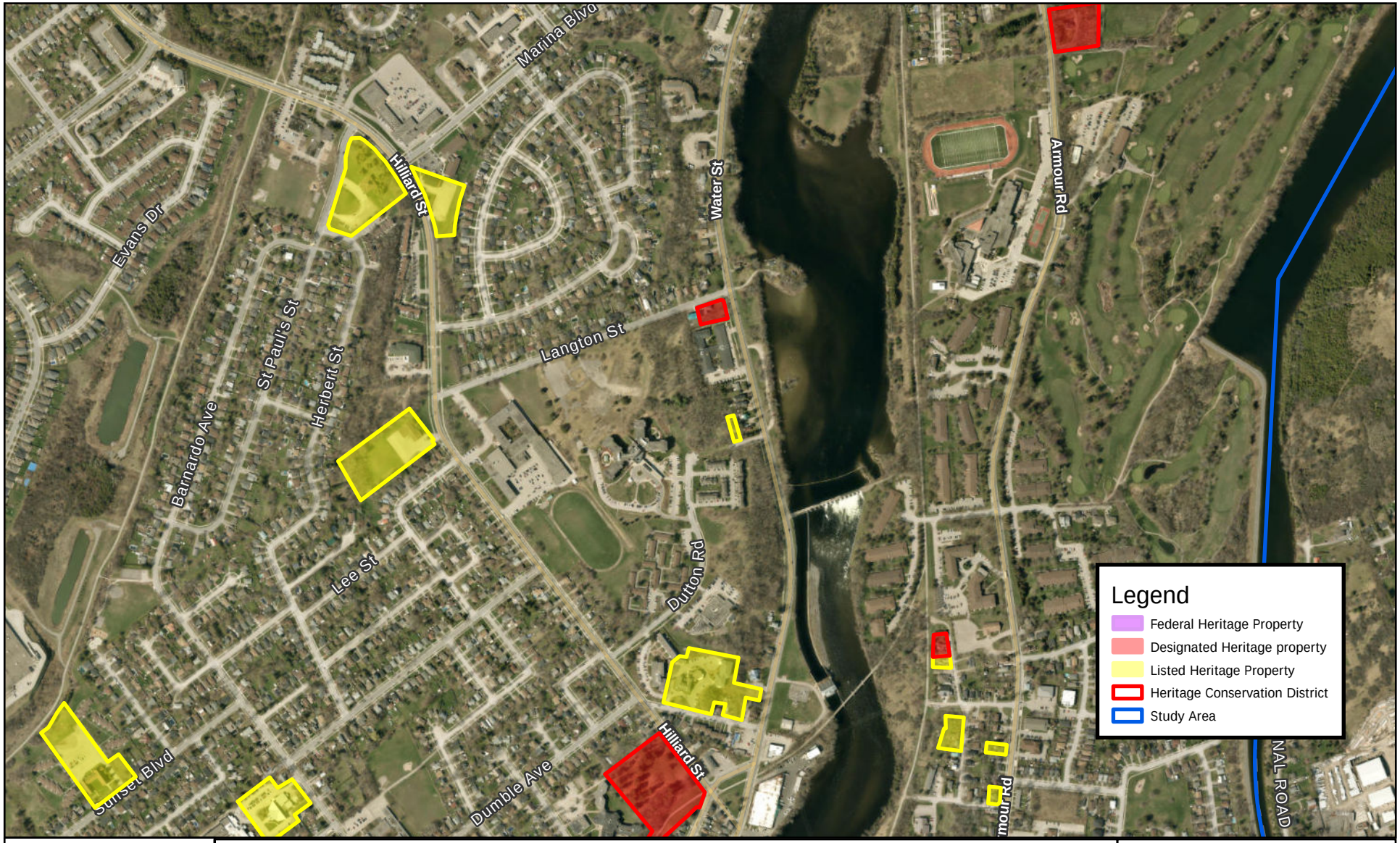
Coordinate System: NAD 1983 UTM Zone 17N

N

Scale 1:12,500

0 175 350 Meters

0 0.17 0.35 Km



Peterborough Sanity Wastewater Master Plan

Map 4: Key Map #3

City of Peterborough, Maxar

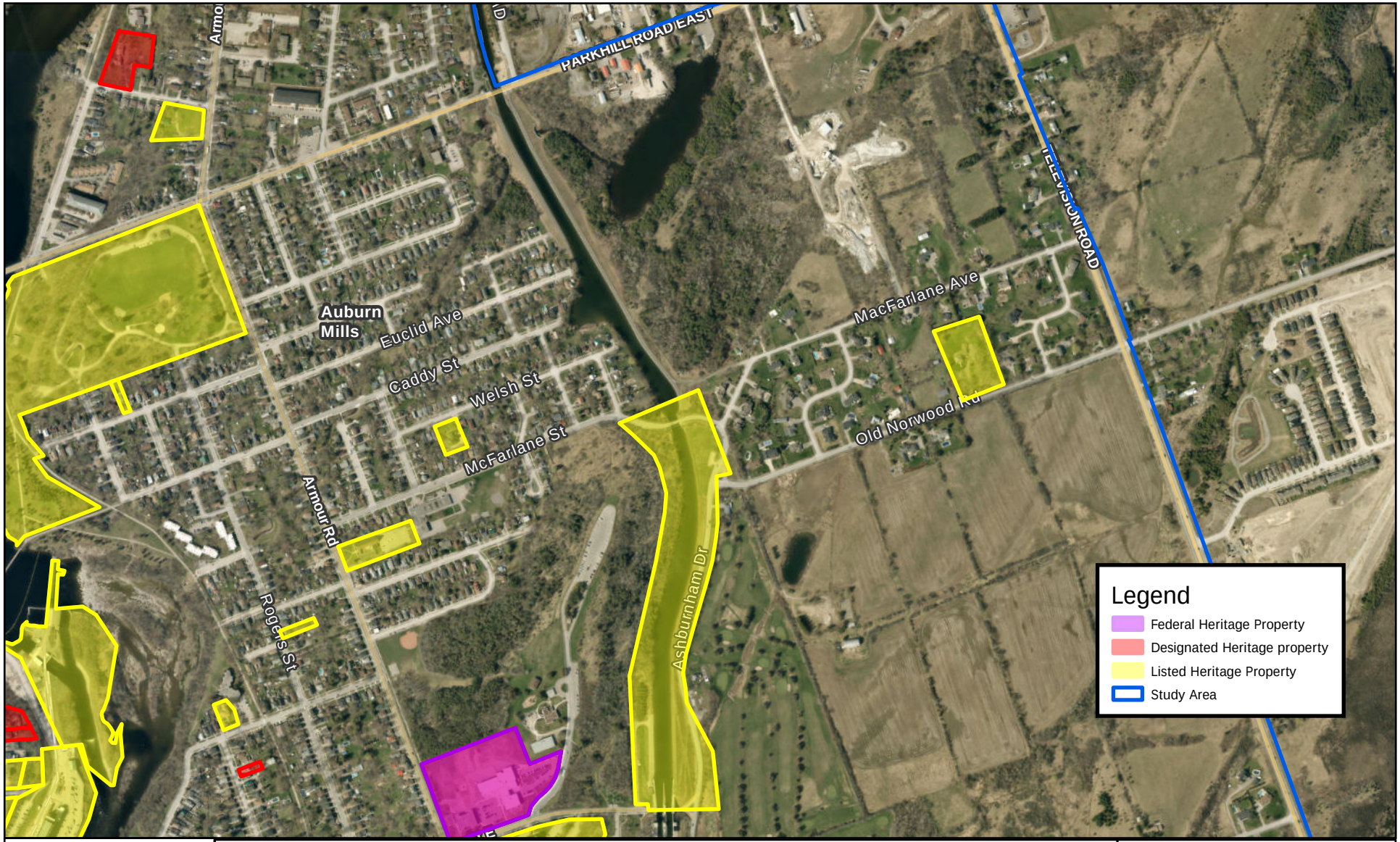
Coordinate System: NAD 1983 UTM Zone 17N

N

Scale 1:10,000

0 175 350 Meters

0 0.17 0.35 Km



Peterborough Sanity Wastewater Master Plan

Map 5: Key Map #4

City of Peterborough, Maxar

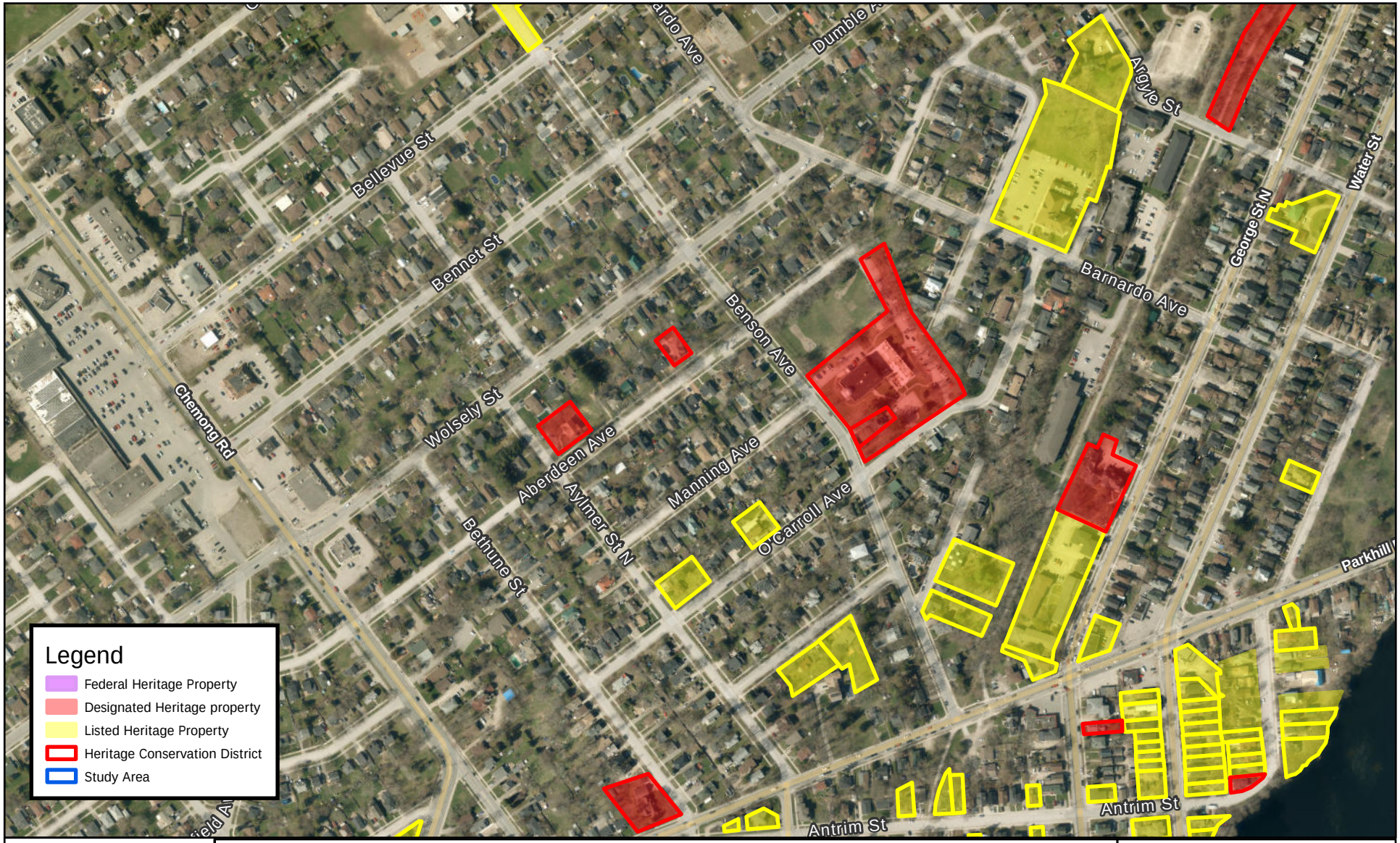
Coordinate System: NAD 1983 UTM Zone 17N

N

Scale 1:10,000

0 175 350 Meters

0 0.17 0.35 Km



Peterborough Sanity Wastewater Master Plan

Map 6: Key Map #5

City of Peterborough, Maxar

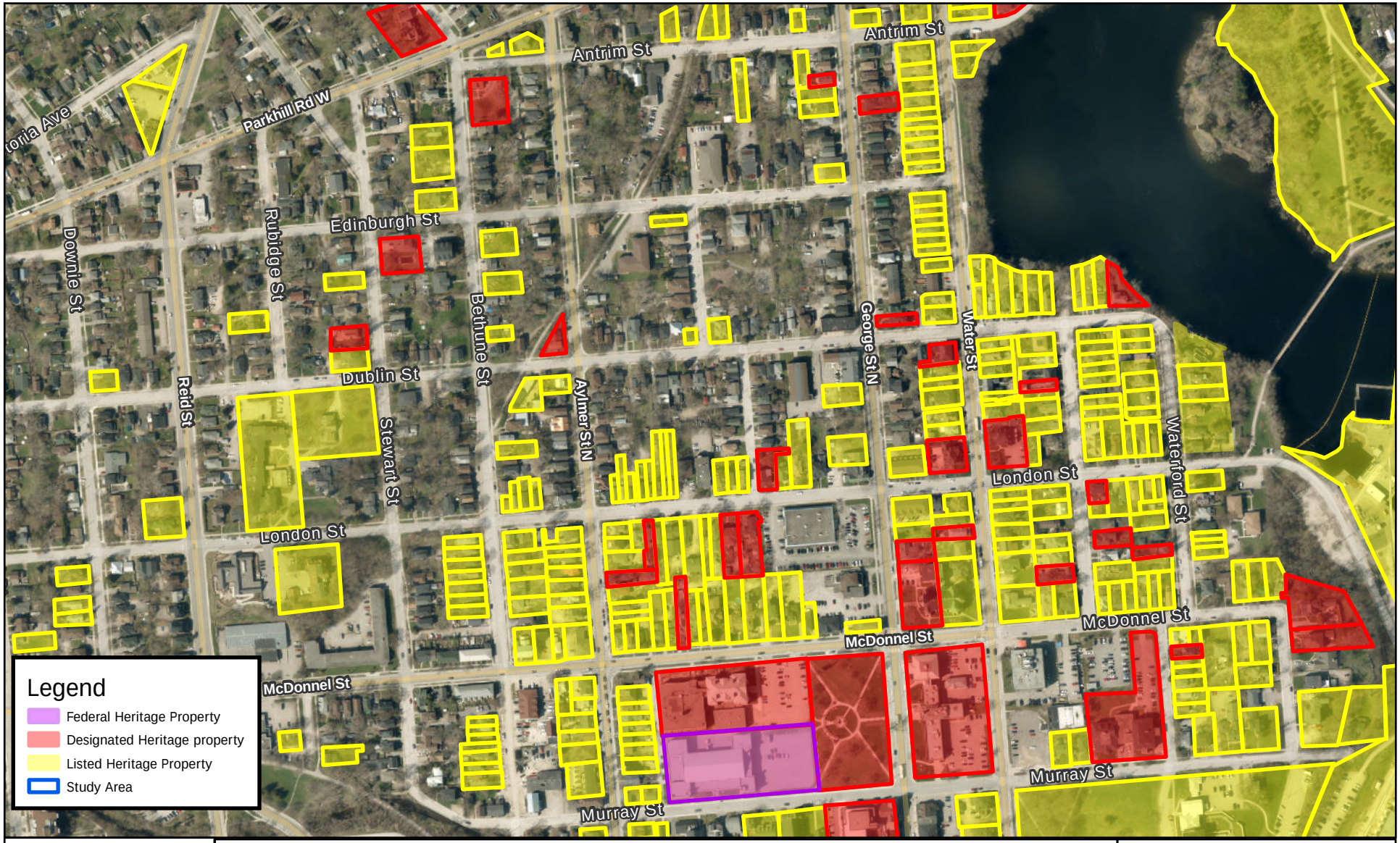
Coordinate System: NAD 1983 UTM Zone 17N

N

Scale 1:5,000

0 87.5 175 Meters

0 0.07 0.15 Km



Peterborough Sanity Wastewater Master Plan

Map 7: Key Map #6

City of Peterborough, Maxar

Coordinate System: NAD 1983 UTM Zone 17N

N

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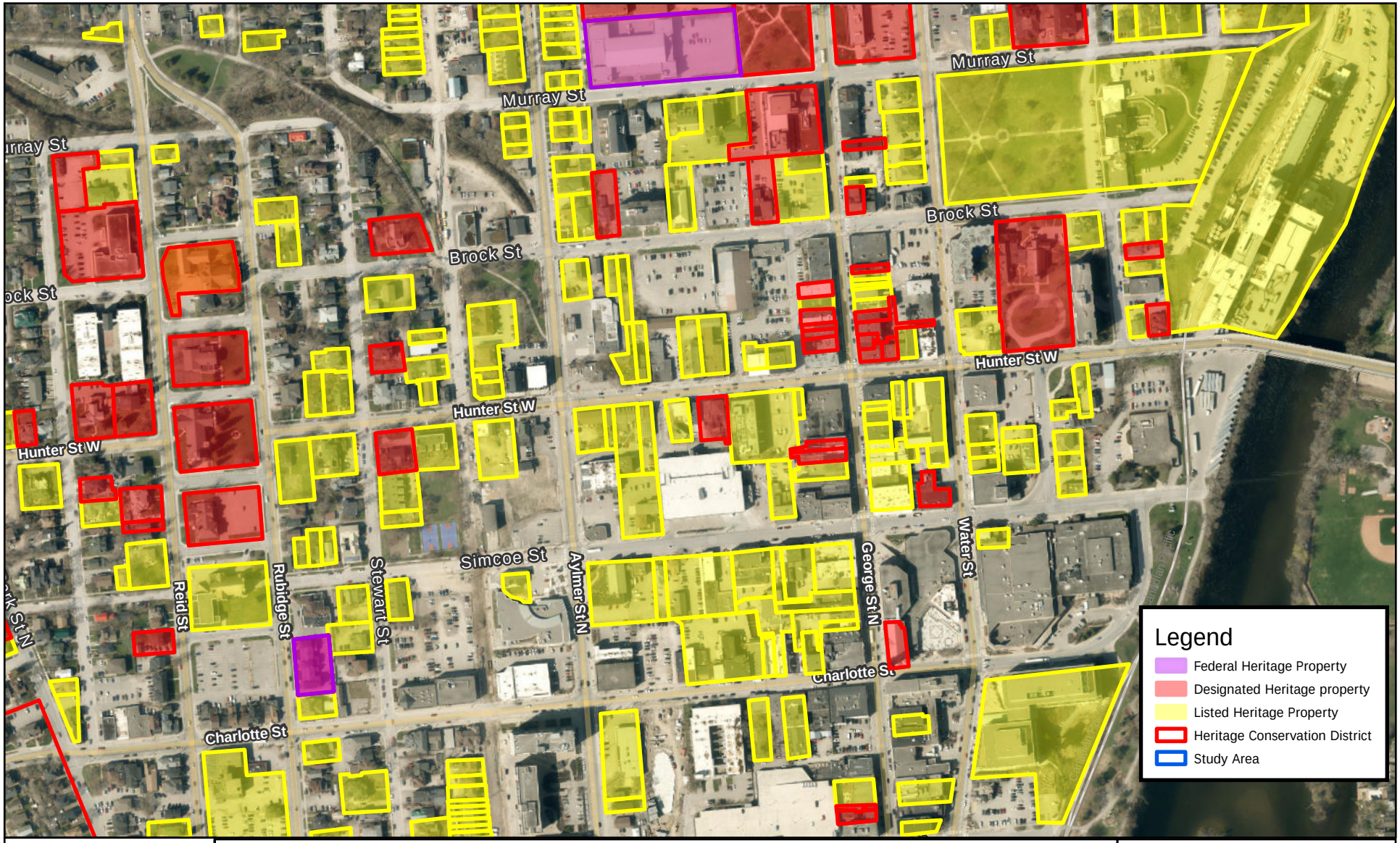
0 0.07 0.15 Km



Peterborough Sanity Wastewater Master Plan

Map 8: Key Map #7

City of Peterborough, Maxar

Coordinate System: NAD 1983 UTM Zone 17N

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Peterborough Sanity Wastewater Master Plan

Map 9: Key Map #8

City of Peterborough, Maxar

Coordinate System: NAD 1983 UTM Zone 17N

N

Scale 1:10,000

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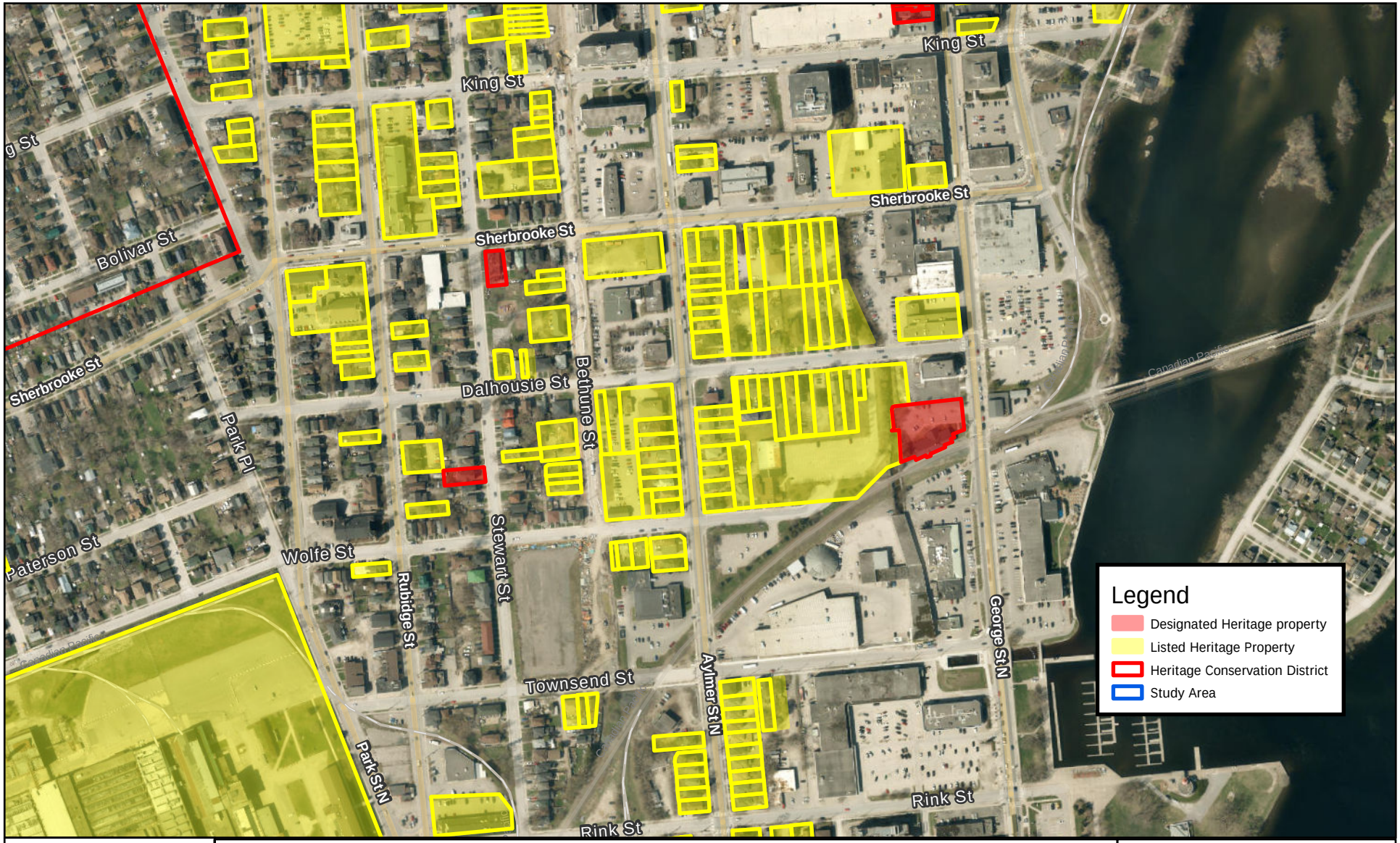

Peterborough Sanity Wastewater Master Plan

Map 10: Key Map #9

City of Peterborough, Maxar

Coordinate System: NAD 1983 UTM Zone 17N

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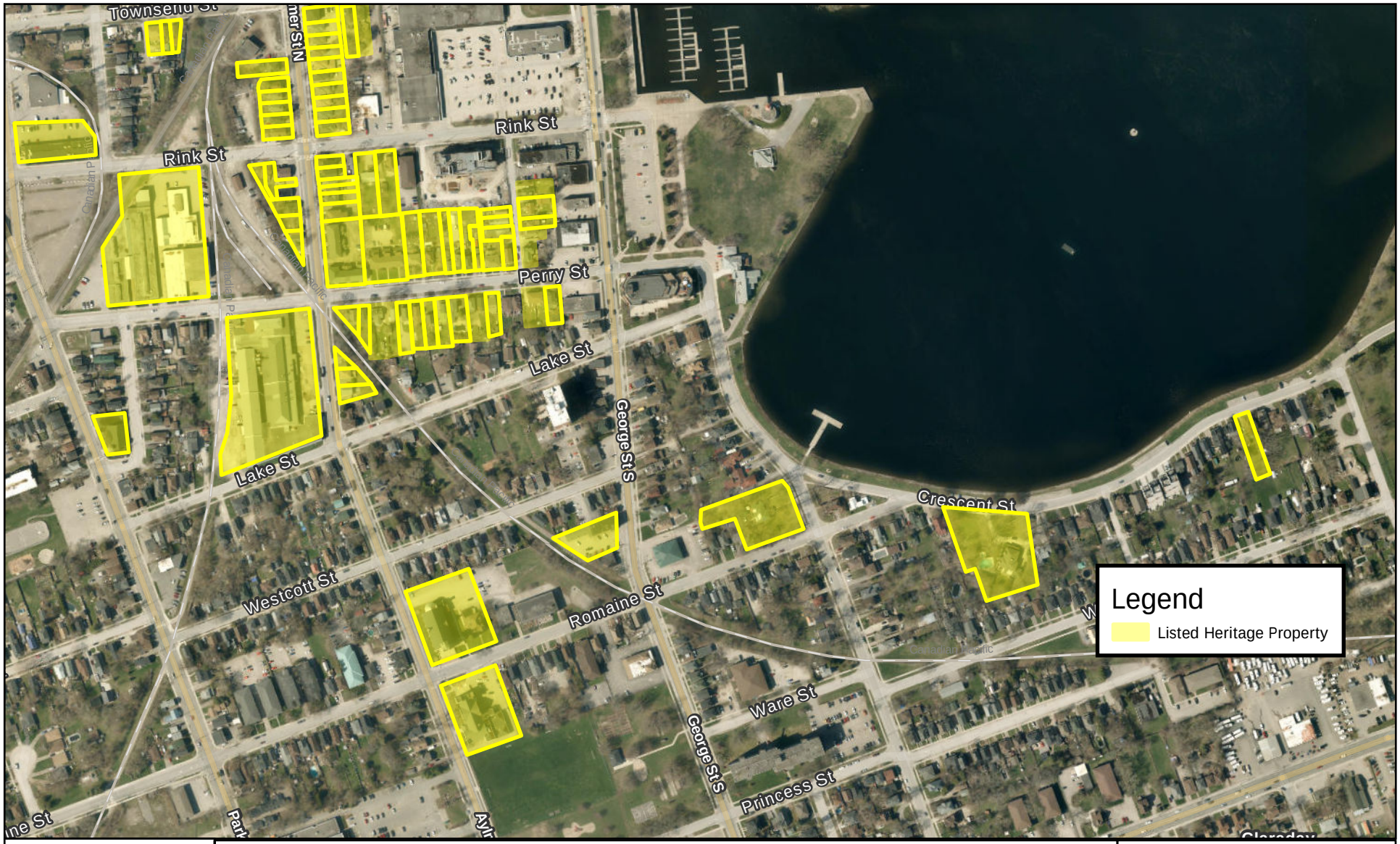

Peterborough Sanity Wastewater Master Plan

Map 11: Key Map #10

City of Peterborough, Maxar

Coordinate System: NAD 1983 UTM Zone 17N

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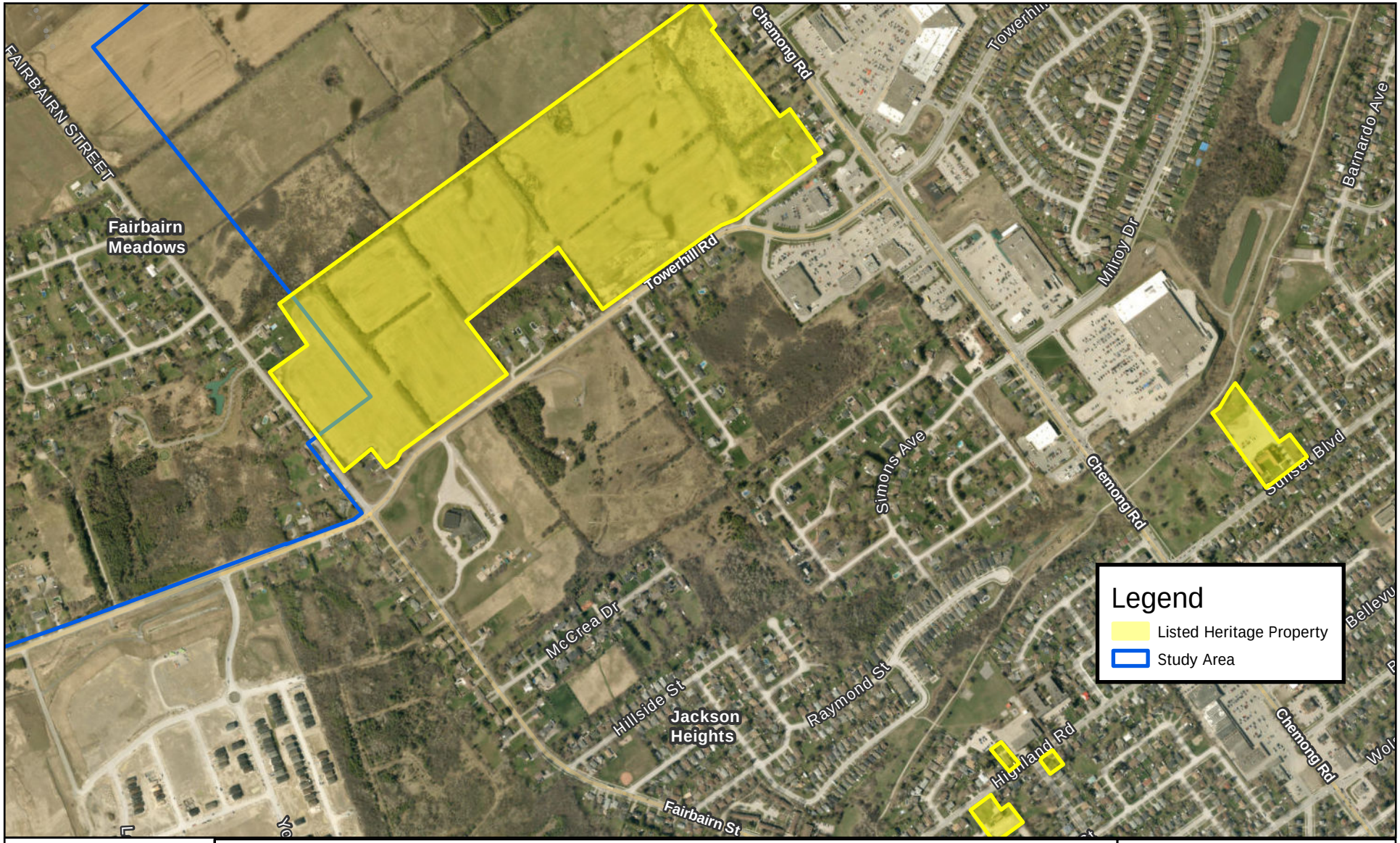

Peterborough Sanity Wastewater Master Plan

Map 12: Key Map #11

City of Peterborough, Maxar

Coordinate System: NAD 1983 UTM Zone 17N

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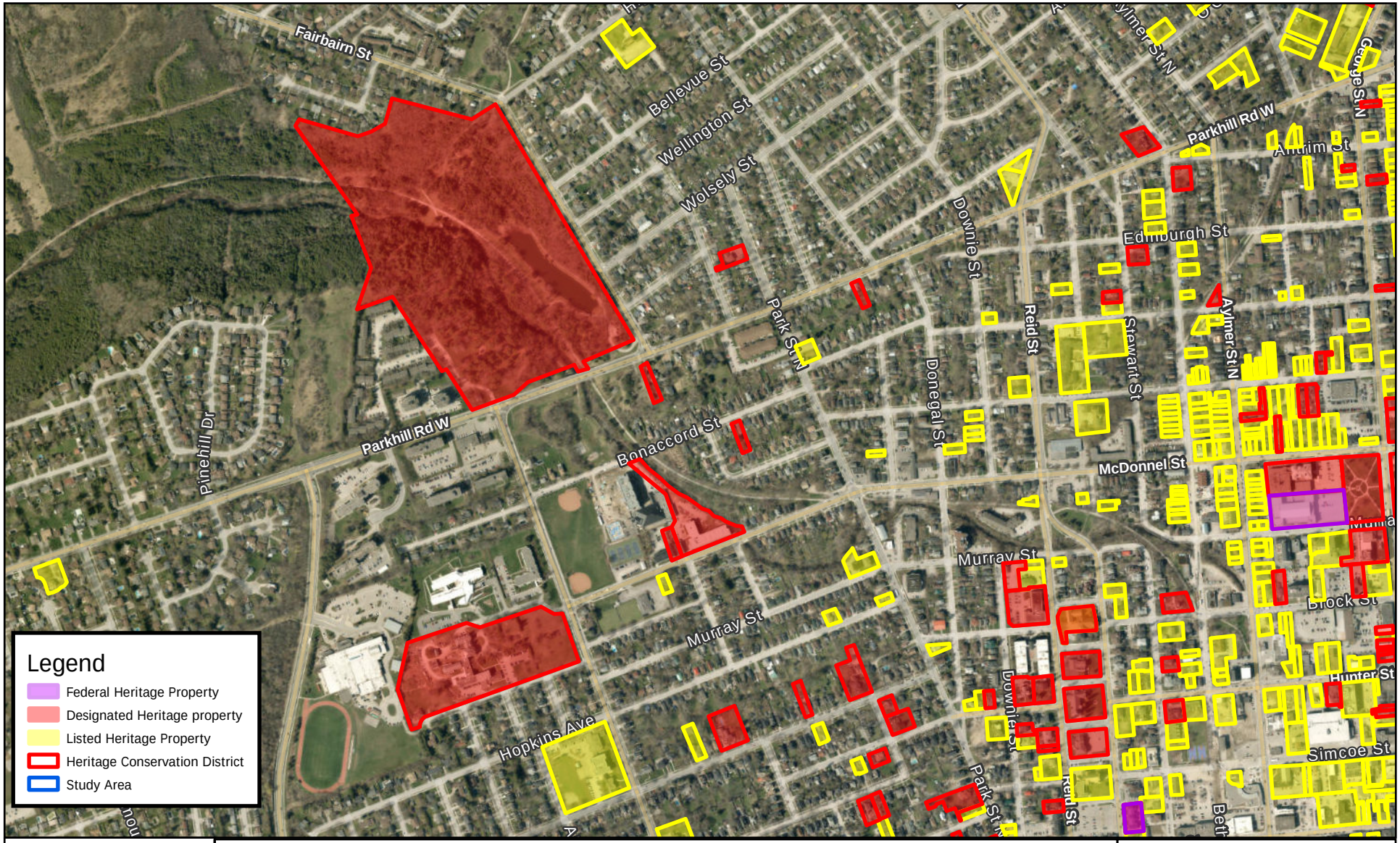

Peterborough Sanity Wastewater Master Plan

Map 13: Key Map #12

City of Peterborough, Maxar

Coordinate System: NAD 1983 UTM Zone 17N

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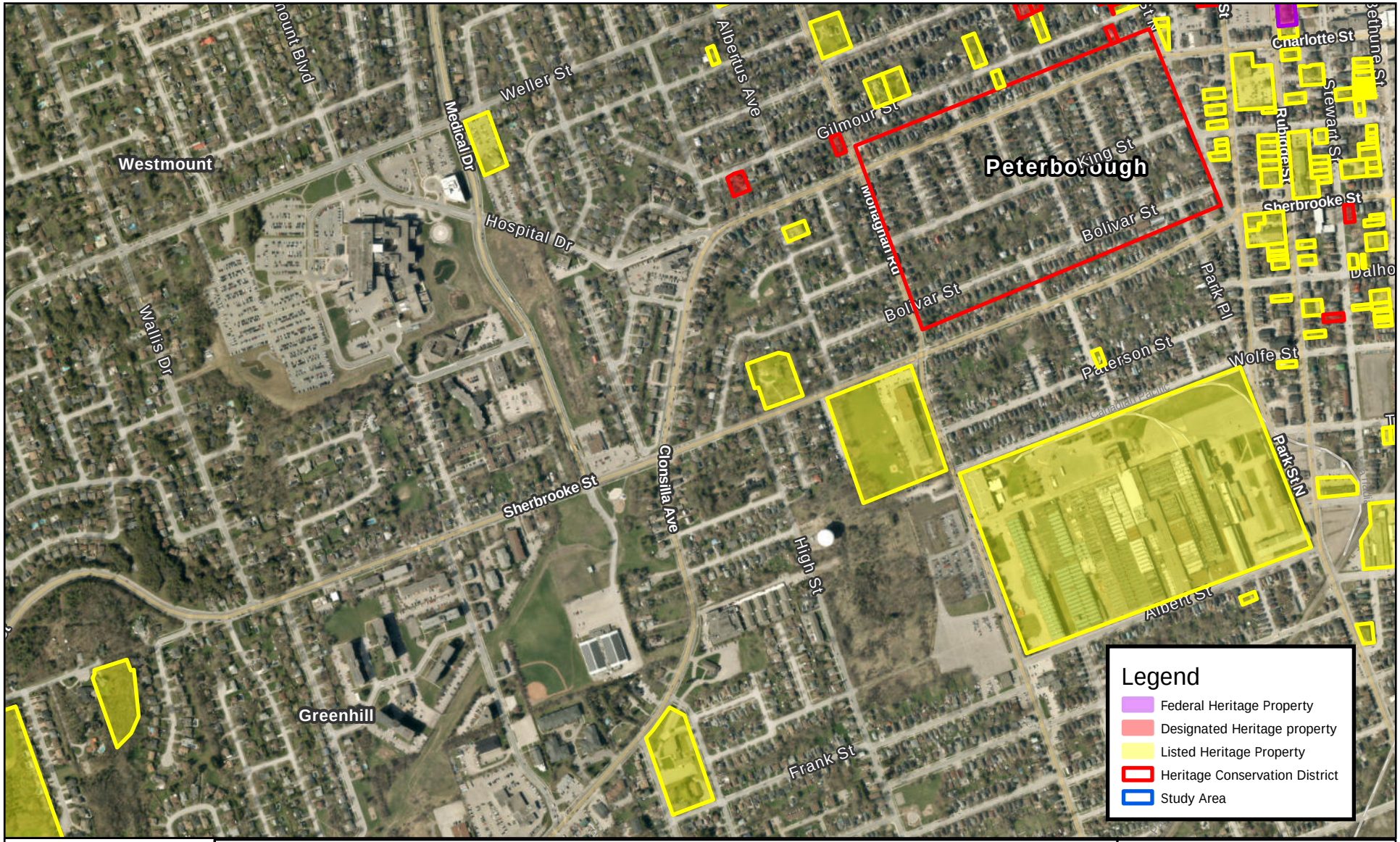

Peterborough Sanity Wastewater Master Plan

Map 14: Key Map #13

City of Peterborough, Maxar

Coordinate System: NAD 1983 UTM Zone 17N

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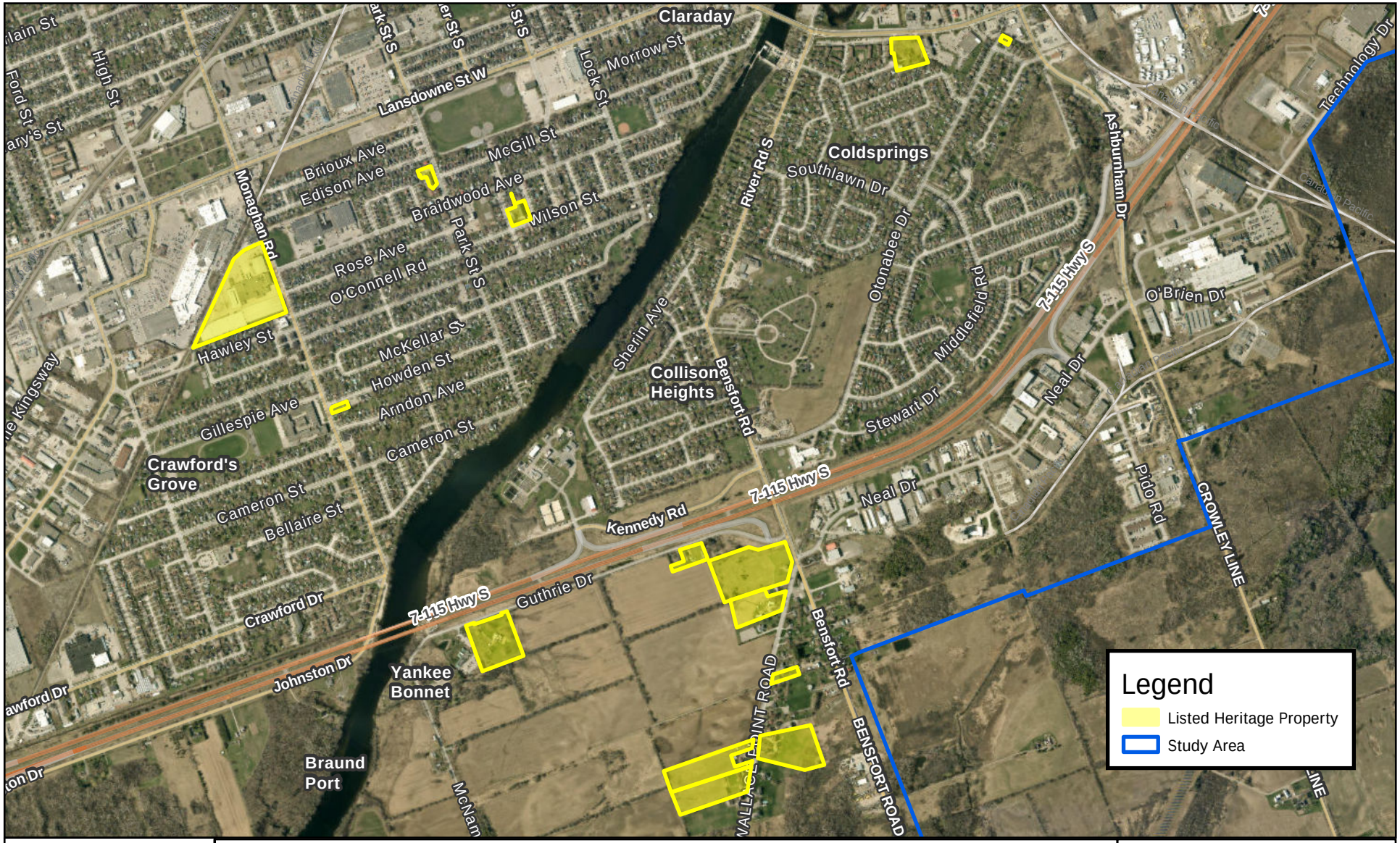

Peterborough Sanity Wastewater Master Plan

Map 15: Key Map #14

City of Peterborough, Maxar

Coordinate System: NAD 1983 UTM Zone 17N

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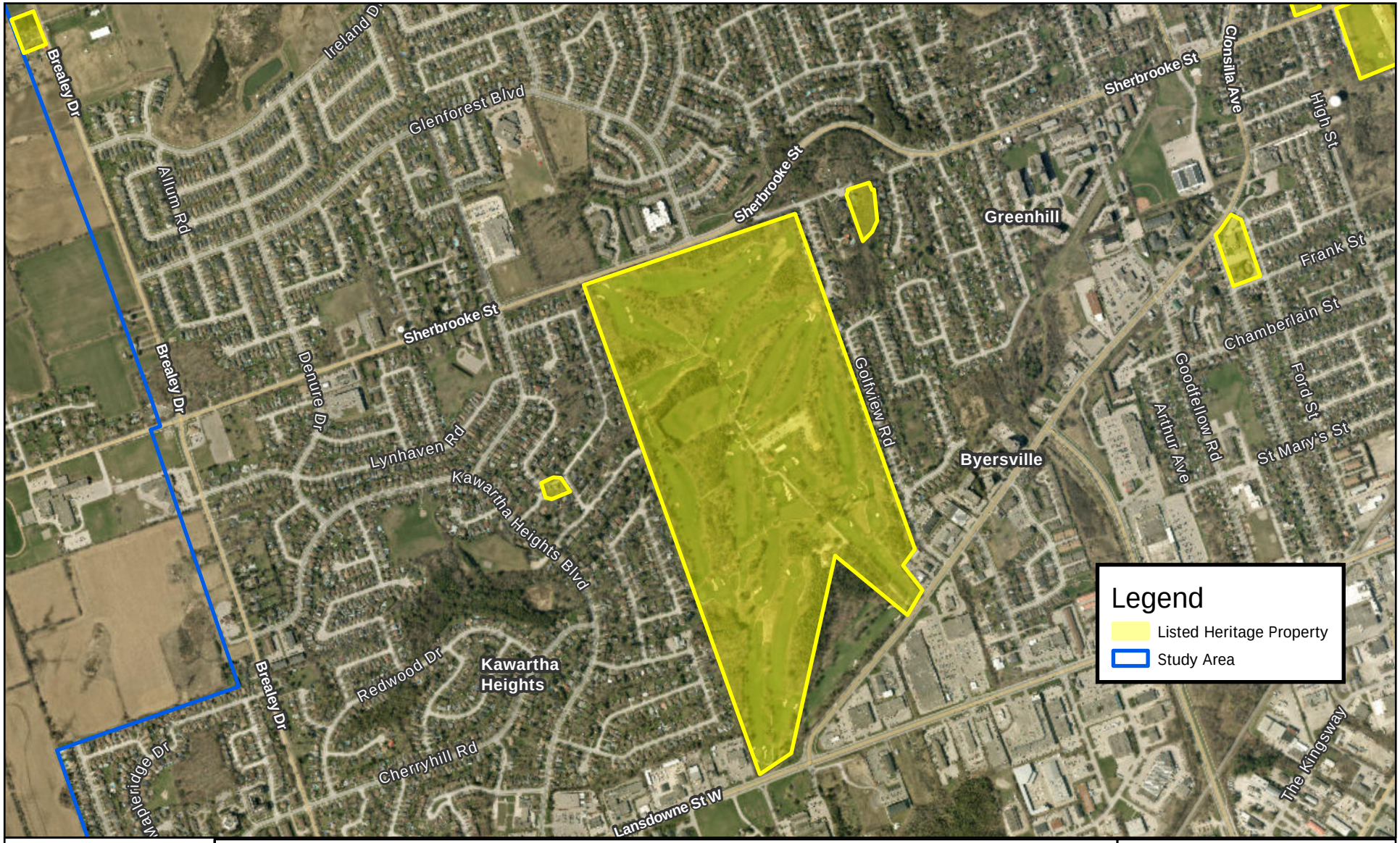

Peterborough Sanity Wastewater Master Plan

Map 16: Key Map #15

City of Peterborough, Maxar

Coordinate System: NAD 1983 UTM Zone 17N

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Scale 1:15,000

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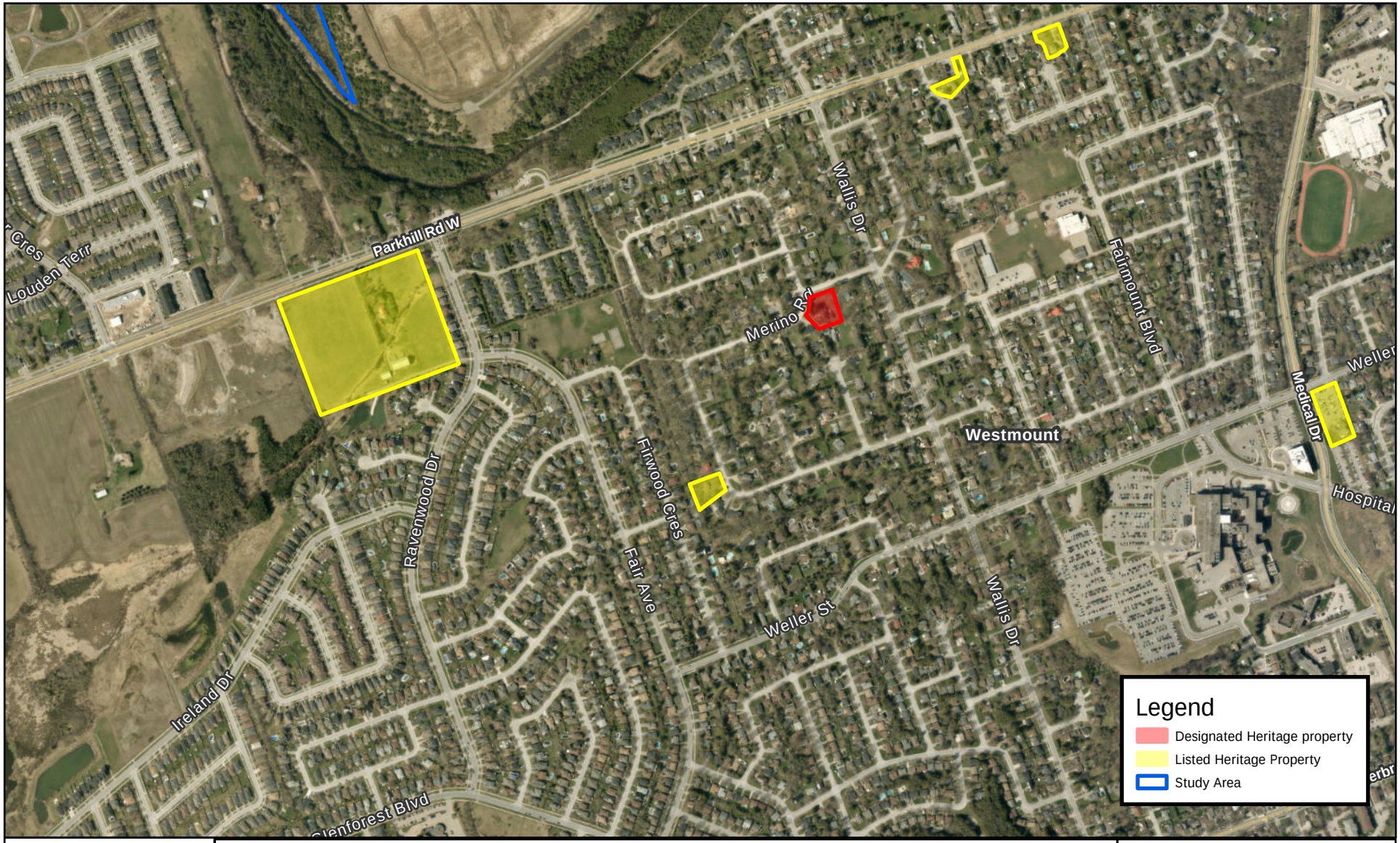

Peterborough Sanity Wastewater Master Plan

Map 17: Key Map #16

City of Peterborough, Maxar

Coordinate System: NAD 1983 UTM Zone 17N

N

Scale 1:10,000

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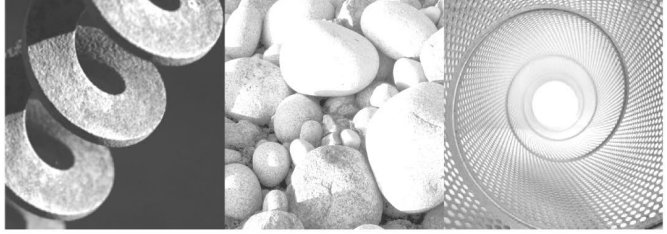

City of Peterborough Sanitary Master Plan

VOLUME 2*:* APPENDIX A3

Stage 1 Archaeological Assessment Report

Prepared by:
GEI Consultants Canada

April 2025

The City of Peterborough is committed to ensuring that all City services, programs, and facilities are inclusive and accessible. Please contact the Project Team if you need any accommodations to provide comments and/or feedback for this Study.

Stage 1 Archaeological Assessment – City of Peterborough Sanitary Master Plan, City of Peterborough, Ontario

Project Number: 2023-0166	**PIF: P1153-0117-2023**
Report Type: Original	**Report Date:** April 10, 2025

Licensee: Mr. Adam Long, M.Sc.

Parslow Heritage Consultancy Inc. 883 St. Clair Ave. West, Toronto, ON, M6C 1C4	**GM BluePlan Engineering Ltd.** 3300 Highway 7, Suite 402, Vaughan, ON, L4K 4M3

Table of Contents

Tables

Executive Summary

Parslow Heritage Consultancy Inc. (PHC) was retained by GM BluePlan Engineering Ltd, to conduct a Stage 1 archaeological assessment on behalf of the City of Peterborough to inform a Class Environmental Assessment for the City of Peterborough Sanitary Master Plan. The City of Peterborough's municipal boundaries encompass approximately 6,000 hectares (ha) (14,827 acres). The study area encompasses the City of Peterborough, the Township of Cavan-Monaghan, and the Township of Otonabee-South Monaghan (Map 1). The City of Peterborough is designated into five wards; Otonabee (Ward 1), Monaghan (Ward 2), Town (Ward 3), Ashburnham (Ward 4), and Northcrest (Ward 5) (Map 2).

The objectives of the Stage 1 archaeological assessment are defined in the Ministry of Citizenship and Multiculturalism's (MCM) *Standards and Guidelines for Consultant Archaeologists* (2011). A Stage 1 archaeological assessment provides compiled information about the study area's geography, history, current land conditions as well as any previous archaeological research and listed archaeological sites on or within the vicinity, as well as specific direction for the protection, management and/or recovery of these resources.

A negative indicator of archaeological potential is extensive below-grade land disturbance. This includes widespread earth movement activities that would have removed or relocated any archaeological resources to such a degree that their information potential and cultural heritage value or interest has been lost. Disturbances consisting of existing buried infrastructure associated with the existing house footprint, and the outbuildings, as well as a paved driveway. As such, these areas area considered to exhibit low archaeological potential; no further archaeological assessment is recommended for these areas.

Based on the background research provided in this report, archaeological potential is present in the study area, and many properties are deemed to have such potential. Furthermore, there are other properties that are known to have recorded sites with significant cultural heritage value or interest. By integrating the data obtained from background research and considering the inclusion of areas close to critical water sources and waterways, a model was created to provide a more comprehensive understanding of the inventory of recorded archaeological and heritage resources. The resulting predictive model indicates the locations where known archaeological sites exist, and as-yet unrecorded archaeological sites are most likely to be found.

- The portions of the study area that retain archaeological potential as illustrated on Map 6, and detailed study area mapping (Maps 7 to 20) are recommended for Stage 2 archaeological assessment prior to future ground disturbance.
- All Stage 2 archaeological assessments should be conducted by a licensed consultant archaeologist and follow the requirements set out in the MCM's *Standards and Guidelines for Consultant Archaeologists* (2011).

- Agricultural areas recommended for Stage 2 archaeological assessment should be subject to pedestrian survey at 5 m intervals per Section 2.2.1, while non-agricultural lands should be subject to test pit survey at 5 m intervals per Section 2.1.2 of the MCM's *Standards and Guidelines for Consultant Archaeologists* (2011)
- Portions of the Study Area identified as disturbed (previous construction and/or grading activities) may not have had all potentially archaeological soils removed, particularly within the more urbanized study area. The Stage 1 background research did not adequately account for all potential previous disturbances in the archaeological potential model, as shown in Maps 5 to 20. Additional Stage 2 archaeological assessment, or construction monitoring is required to make determinations about the severity of previous impacts as they relate to archaeological potential assessments.

It is requested that this report be entered into the Ontario Public Register of Archaeological Reports, as provided for in Section 65.1 of the Ontario Heritage Act.

Project Personnel

Project Manager/Licensee	Adam Long, M.Sc. (P1153)
Report Preparation	Sarah News, B.A. (R485)
Graphics	Gabriel Dunk-Gifford, B.A.
Review	Adam Long, M.Sc. (P1153)

Acknowledgements

Rob von Bitter – Ministry of Citizenship and Multiculturalism

Laura Verhaeghe, and James Jorgensen – GM BluePlan Engineering Ltd.

Project Context

This section of the report provides the context for the archaeological assessment and covers three areas: development context, historical context, and archaeological context.

Development Context

Parslow Heritage Consultancy Inc. (PHC) was retained by GM BluePlan Engineering Ltd, to conduct a Stage 1 archaeological assessment on behalf of the City of Peterborough, to inform a Class Environmental Assessment for the City of Peterborough Sanitary Master Plan. The City of Peterborough's municipal boundaries encompasses approximately 6,000 hectares (ha) (14,827 acres). The study area encompasses the City of Peterborough, the Township of Cavan Monaghan, and the Township of Otonabee South Monaghan (Map 1). This Stage 1 archaeological assessment is intended to inform both the planning process and the next steps for further archaeological assessments that may be required as development proceeds.

The City of Peterborough is designated into five wards; Otonabee (Ward 1), Monaghan (Ward 2), Town (Ward 3), Ashburnham (Ward 4), and Northcrest (Ward 5) (Map 2).

All archaeological work documented in this report was completed under the Ministry of Citizenship and Multiculturalism (MCM) *Standards and Guidelines for Consultant Archaeologists.*

Historical Context

This section describes the past and present land use and settlement history of the property, and any other relevant historical information gathered through the background research (MCM Section 7.5.7 Standard 1).

Indigenous History

Indigenous peoples of southern Ontario have left behind archaeologically significant resources throughout the province that show continuity with past peoples even if they were not recorded in historic Euro-Canadian documents. Table 1 illustrates this continuity and demonstrates over 11,000 years of Indigenous occupation of southern Ontario (Ellis and Ferris 1990).

TABLE 1: OVERVIEW OF THE CULTURAL CHRONOLOGY OF SOUTHERN ONTARIO

Period	Characteristics	Time	Comments
Early Paleo	Fluted Points	9,000 – 8,400 BC	Caribou hunters
Late Paleo	Hi-Lo Points	8,400 – 8,000 BC	Smaller but more numerous sites

Early Archaic	Kirk, Nettling, and Bifurcate Base Points	8,000 – 6,000 BC	Slow population growth
Middle Archaic I	Stanley/Neville, Stemmed Points	6,000 – 4,000 BC	Environment similar to present
Middle Archaic II	Thebes, Otter Creek Points	4,000 – 3,000 BC	
Middle Archaic III	Brewerton Side and Corner Notched Points	3,000 – 2,000 BC	
Late Archaic I	Narrow Point (Lamoka, Normanskill) Broad Point (Genesee, Adder Orchard) Small Point (Crawford Knoll, Innes, Ace-of-Spades)	2,000 – 1,800 BC 1,800 – 1,500 BC 1,500 – 1,100 BC	Increasing site size Large chipped lithic tools Introduction of bow hunting
Terminal Archaic	Hind Points	1,100 – 950 BC	Emergence of true cemeteries
Early Woodland	Meadowood Points	950 – 400 BC	Introduction of pottery
Middle Woodland	Dentate/Pseudo-Scallop Pottery Princess Point	400 BC – AD 500 AD 550 – 900	Increased sedentism Introduction of corn
Late Woodland	Early Ontario Middle Ontario Late Ontario (Neutral)	AD 900 – 1,300 AD 1,300 – 1,400 AD 1,400 – 1,650	Emergence of agricultural villages Large longhouses (100m+) Tribal warfare and displacement

Contact	Various Algonkian and Iroquoian Groups	AD 1,700 – 1,875	Early written records and treaties

Paleo and Archaic Hunter-Gatherers

The first human settlement in south-central Ontario can be traced back 11,000 years, just after the end of the Wisconsin Glacial Period, when this area was settled by Indigenous groups that had been living south of the Great Lakes. The period of these first inhabitants is known as the Paleo (Ellis and Deller 1990), a time in which bands of small hunter gatherer, consisting of probably no more than 25-35 individuals, followed a pattern of seasonal mobility extending across wide-ranging territories shaped extensively by the ebb and flow of glaciers.

The Paleo period was a time of rapid environmental change. As the glaciers retreated sparse tundra and evergreen forests gave way to extensive deciduous forests and water levels in the Great Lakes rose dramatically (Ellis, Kenyon, and Spence 1990:68-69). By the end of this period (8000 BC), many of the large game species that Paleo hunters had relied upon either moved further north, or as in the case of the mastodons and mammoths, become extinct. Thus, the end of the Late Paleo Period was heralded by numerous technological and cultural innovations, likely as responses to the dynamic nature of the post-glacial environment and region-wide population increases. These innovations continue to be found in sites belonging to the direct descendants of the Paleo, groups of people known by archaeologists as “Archaic.”

The term “Archaic” designates preagricultural sites lacking in pottery and other specific artefact forms (Ellis, Kenyon, and Spence 1990; 65) and are primarily distinguished from Paleo sites by a significantly greater degree of artefact diversity and regional variety. Archaic people began to make stone tools out of coarser raw material by laboriously grinding the rock into the desired shape. The introduction of ground stone tools such as celts and axes, suggests the beginnings of a simple woodworking industry and an increased use of localized stone sources indicates that Archaic populations may have been less nomadic than their Paleo ancestors (Munson and Jamieson 2013; 41). It is likely that gradual infilling of the landscape resulting from rising water levels and population growth necessitated the development of strategies to support more people from smaller areas of liveable land.

During the Late Archaic Period (2,500-950 BC) the trends towards decreased territory size, a broadening subsistence base, population growth and increasing sedentism continued and it is during this period that the first true cemeteries appeared. During the Late Archaic Period, if an individual died while his or her group happened to be at some distance from their group cemetery, the bones would be kept until they could be placed in the cemetery, suggesting that people returned with greater frequency to the same areas. These first cemeteries may have served as visible reminders of a group’s cultural history and demarcated their rights to an area. Living in a time before farming or pottery, early hunter gatherers hunted, fished, and travelled in a land that was dynamic, ever-changing, and far removed from modern or historic ways of life.

Woodland Period

The Early Woodland Period (950 to 400 BC) is distinguished from the Late Archaic Period primarily by the gradual adoption of ceramic technology. However, in many ways the life ways of people in this period show a high degree of continuity with the preceding Late Archaic and it is not until the Middle Woodland (300 BC to AD 500) that there is an evident shift in settlement and subsistence patterns towards a sedentary way of life.

Middle Woodland peoples relied much more extensively on ceramic technology and vessels were often heavily decorated with hastily impressed designs covering the entire exterior surface and upper portion of the vessel interior. The Middle Woodland provides a major point of departure from the Archaic and Early Woodland; fish was becoming an increasingly important part of diets and sites along the margins of major lakes and rivers appear to have functioned as base camps instead of seasonally utilized locations, indicating a greater degree of sedentism and reliance on fishing technology.

The Late Woodland Period is widely accepted as the beginning of a truly agricultural way of life in south-central Ontario. Researchers have suggested that a warming trend during this period may have encouraged the spread of maize into southern Ontario by providing a greater number of frost-free days (Stothers and Yarnell 1977). The presence of carbonized corn kernels and cob fragments recovered from sub-floor storage pits indicates that agriculture was becoming a vital part of the Early Iroquoian economy.

The Middle Ontario Iroquoian Period (AD 1300-1400) witnessed several interesting developments in terms of settlement patterns and artefact assemblages. The size of villages and houses increased dramatically, with house lengths almost doubling to an average of 30m. Possible explanations for these shifts involve changes in economic and socio-political organization (Dodd et al. 1990:357); small villages may have amalgamated to form larger communities for mutual defence (Dodd et al. 1990:357). These large villages were often heavily defended with numerous rows of wooden palisades, suggesting that defence may have been one of the rationales for smaller groups banding together.

By the late 1400s major villages covered as many as 4-5 hectares and would have contained over 2,000 individuals each. A change in the orientation of longhouses at this time may indicate the initial development of the tribes and nations which were a characteristic of the historically known Iroquoian peoples (Dodd et al. 1990:358). Four Hundred years ago Ontario was home to about 75,000 Indigenous people, divided into two major cultural groups – Algonquians and Iroquoians.

After AD 1450, house lengths begin to decrease, with houses dating between AD 1500-1580 averaging a mere 30 m in length. The even shorter houses witnessed on Historical Period sites can be at least partially attributed to the population reductions associated with the introduction of European diseases such as smallpox (Lennox and Fitzgerald 1990:405, 410) which, in the span of a few years, had reduced the population to a mere 30,000 people. With the deaths of many bearers of oral history in the 1630's much of the ancient oral history in Ontario was lost. Archaeology provides an alternative means of understanding pre-European history by providing unique information on the

movement of people throughout the landscape, their interactions with one another and with the environment, over the course of 13,000 years.

Oral History of the Michi Saagiig Peoples

This oral history was provided by Gitiga Migizi, respected Elder and Knowledge Keeper of the Michi Saagiig Nation (Gitiga Migizi and Julie Kapyrka, 2015).

The traditional homelands of the Michi Saagiig (Mississauga Anishinaabeg) encompass a vast area of what is now known as southern Ontario. The Michi Saagiig occupied and fished the north shore of Lake Ontario where the various tributaries emptied into the lake. Their territories extended north into and beyond the Kawarthas as winter hunting grounds on which they would break off into smaller social groups for the season, hunting and trapping on these lands, then returning to the lakeshore in spring for the summer months.

The Michi Saagiig were a highly mobile people, travelling vast distances to procure subsistence for their people. They were also known as the “Peacekeepers” among Indigenous nations. The Michi Saagiig homelands were located directly between two very powerful Confederacies: The Three Fires Confederacy to the north and the Haudenosaunee Confederacy to the south. The Michi Saagiig were the negotiators, the messengers, the diplomats, and they successfully mediated peace throughout this area of Ontario for countless generations.

Michi Saagiig oral histories speak to their people being in this area of Ontario for thousands of years. These stories recount the “Old Ones” who spoke an ancient Algonquian dialect. The histories explain that the current Ojibwa phonology is the 5th transformation of this language, demonstrating a linguistic connection that spans back into deep time. The Michi Saagiig of today are the descendants of the ancient peoples who lived in Ontario during the Archaic and Paleo periods. They are the original inhabitants of southern Ontario, and they are still here today.

The traditional territories of the Michi Saagiig span from Gananoque in the east, all along the north shore of Lake Ontario, west to the north shore of Lake Erie at Long Point. The territory spreads as far north as the tributaries that flow into these lakes, from Bancroft and north of the Haliburton highlands. This also includes all the tributaries that flow from the height of land north of Toronto like the Oak Ridges Moraine, and all of the rivers that flow into Lake Ontario (the Rideau, the Salmon, the Ganaraska, the Moira, the Trent, the Don, the Rouge, the Etobicoke, the Humber, and the Credit, as well as Wilmot and 16 Mile Creeks) through Burlington Bay and the Niagara region including the Welland and Niagara Rivers, and beyond. The western side of the Michi Saagiig Nation was located around the Grand River which was used as a portage route as the Niagara portage was too dangerous. The Michi Saagiig would portage from present-day Burlington to the Grand River and travel south to the open water on Lake Erie (Kapyrka 2017).

Michi Saagiig oral histories also speak to the occurrence of people coming into their territories sometime between 500-1000 A.D. seeking to establish villages and a corn growing economy – these newcomers included peoples that would later be known as

the Huron-Wendat, Neutral, Petun/Tobacco Nations. The Michi Saagiig made Treaties with these newcomers and granted them permission to stay with the understanding that they were visitors in these lands. Wampum was made to record these contracts, ceremonies would have bound each nation to their respective responsibilities within the political relationship, and these contracts would have been renewed annually (see Gitiga Migizi and Kapyrka 2015). These visitors were extremely successful as their corn economy grew as well as their populations. However, it was understood by all nations involved that this area of Ontario were the homeland territories of the Michi Saagiig

The Odawa Nation worked with the Michi Saagiig to meet with the Huron-Wendat, the Petun, and Neutral Nations to continue the amicable political and economic relationship that existed – a symbiotic relationship that was mainly policed and enforced by the Odawa people. Problems arose for the Michi Saagiig in the 1600s when the European way of life was introduced into southern Ontario. Also, around the same time, the Haudenosaunee were given firearms by the colonial governments in New York and Albany which ultimately made an expansion possible for them into Michi Saagiig territories. There began skirmishes with the various nations living in Ontario at the time. The Haudenosaunee engaged in fighting with the Huron-Wendat and between that and the onslaught of European diseases, the Iroquoian speaking peoples in Ontario were decimated. The onset of colonial settlement and missionary involvement severely disrupted the original relationships between these Indigenous nations. Disease and warfare had a devastating impact upon the Indigenous peoples of Ontario, especially the large sedentary villages, which mostly included Iroquoian speaking peoples. The Michi Saagiig were largely able to avoid the devastation caused by these processes by retreating to their wintering grounds to the north, essentially waiting for the smoke to clear.

Michi Saagiig Elder Gitiga Migizi*(2017) recounts:

> *“We weren’t affected as much as the larger villages because we learned to paddle away for several years until everything settled down. And we came back and tried to bury the bones of the Huron but it was overwhelming, it was all over, there were bones all over – that is our story.*
>
> *There is a misnomer here, that this area of Ontario is not our traditional territory and that we came in here after the Huron-Wendat left or were defeated, but that is not true. That is a big misconception of our history that needs to be corrected. We are the traditional people, we are the ones that signed treaties with the Crown. We are recognized as the ones who signed these treaties and we are the ones to be dealt with officially in any matters concerning territory in southern Ontario.*
>
> *We had peacemakers go to the Haudenosaunee and live amongst them in order to change their ways. We had also diplomatically dealt with some of the strong chiefs to the north and tried to make peace as much as possible. So we are very important in terms of keeping the balance of relationships in harmony.*
>
> *Some of the old leaders recognized that it became increasingly difficult to keep the peace after the Europeans introduced guns. But we still continued to meet, and we*

> *still continued to have some wampum, which doesn't mean we negated our territory or gave up our territory – we did not do that. We still consider ourselves a sovereign nation despite legal challenges against that. We still view ourselves as a nation and the government must negotiate from that basis."*

Often times, southern Ontario is described as being "vacant" after the dispersal of the Huron-Wendat peoples in 1649 (who fled east to Quebec and south to the United States). This is misleading as these territories remained the homelands of the Michi Saagiig Nation.

The Michi Saagiig participated in eighteen treaties from 1781 to 1923 to allow the growing number of European settlers to establish in Ontario. Pressures from increased settlement forced the Michi Saagiig to slowly move into small family groups around the present-day communities: Curve Lake First Nation, Hiawatha First Nation, Alderville First Nation, Scugog Island First Nation, New Credit First Nation, and Mississauga First Nation.

Colonialism in Canada

The Canada we see today is one that was built on the principles of Settler Colonialism. This is a specific kind of colonialism whereby the purpose or goal is to replace an indigenous population with an invasive settler population that over time will develop its own identity and sovereignty (Ansari 2023; Shah n.d.). It is important to understand that there are three main features of settler colonialism that had a profound impact on the Indigenous population of Canada.

The first feature is that settler colonizers, unlike other forms of colonization, intend to permanently occupy and assert control over Indigenous lands. Second, settler colonialism is a structure, not an event and continues to the present day in Canada. Third, settler colonialism "seeks its own end" in that the goal is to form a homogenous society that is over-arching and unchallenged (Barker & Lowman 2018).

Initial attempts at settlement and colonization occurred in 1534 with Jacques Cartier, who traveled across the Atlantic Ocean, entered the Gulf of the St. Lawrence, and landed on the shores of what is now Gaspe, Quebec (Hele 2023). However, Cartier's attempts to establish a permanent settlement failed and it was not until 1603, with Samuel de Champlain, did settler colonialism start in Canada with the establishment of New France.

The French and British colonizers, who encountered indigenous populations, thought them to be inferior to themselves and saw the indigenous populations as a source of cheap labour for the fur trade, soldiers for the battlefield, or even household slaves. When Indigenous populations resisted, the Europeans would often wage war against them. As the European powers sought to secure greater control over North America, threats of violence were used to force Indigenous leaders to sign treaties that surrendered political control of their land in exchange for meager financial compensation or dubious promises of protection and safety.

At the time of first contact with the French, in 1615 AD, the traditional territory of the Huron-Wendat, known as Wendake, roughly stretched between the Canadian Shield,

Lake Ontario and the Niagara Escarpment; it has been suggested the Huron-Wendat population at this time was approximately 30,000 individuals (Heidenreich, 1978; Warrick 2008).

In the 1640s the Haudenosaunee, whose territory was located south of the lower Great Lakes, invaded Huron-Wendat territory, largely due to the decrease of available beaver pelts. The majority of the Huron-Wendat population sought sanctuary within the communities of the Petun, Neutral and other neighboring groups, after numerous Huron-Wendat village were destroyed (Stone & Chaput 1978). Commencing in the 1660s, the Haudenosaunee controlled most of southern Ontario (Schmalz 1991; Williamson 2013).

During the mid-17th century, several Algonquin-speaking linguistic and cultural groups within the Anishinaabeg (or Anishinaabe) began to challenge the Haudenosaunee dominance in the region (Gibson 2006; Johnston 2006). Prior to this, the Anishinaabeg were located primarily inland from the north shore of Lake Huron (MCFN n.d.). From 1653 to 1662, following a series of attacks against the Haudenosaunee by groups within the Anishinaabeg, Haudenosaunee dominance in the region began to fail (Schmalz 1991; Warrick 2008). By the 1690s, Haudenosaunee settlements along the northern shores of Lake Ontario were abandoned (Williamson 2013). Following a few battles throughout southern Ontario, the Anishinaabeg replaced the Haudenosaunee in area at the start of the 18th century (Gibson 2006; Schmalz 1991).

European Treaties and Deeds

The study area was ceded to the Crown as part of lands encompassed by Treaty 20, signed in Port Hope on Nov. 5, 1818, by representatives from the Crown, and several Mississauga Nations. The treaty lands encompassed over 1.5 million acres of land located between the Trent River to the West, Lake Simcoe to the East, and Haliburton to the North. The text of the treaty is as follows:

> *….between the Honourable William Claus, Super-intendent-General of Indian Affairs, in behalf of his Majesty of the one part and the Principal Men of the Chippiwa Nation of Indians, claiming the back parts of the Newcastle District, whereas the said Indians were to receive 740 pounds, yearly for a tract of land, situate between the western boundary of the Home District, and extending northerly to a Bay at the northern entrance of Lake Simcoe in the Home District:*
>
> *Commencing on the Western Division Line of the Midland District at the north west angle of the Township of Tawdon; then north 16 degrees west, 33 miles or until it strikes the line forty-five; then along said line to a Bay at the northern entrance of Lake Simcoe; then southerly along the waters edge to the entrance of Talbot River; thence up Talbot River to the eastern boundary of the Home District; thence along said boundary line south 16 degrees east to the south west angle of the Township of Darlington; then along the northern boundary line of the Townships of Darlington, Clarke, Hope an Hamilton to the Rice Lake; then along the southern shore of said lake and of the River Trent to the Western Division Line of the Midland District; then north 16 degrees west to the place of the beginning.*

(Morris 1943:24)

Later revisions to township boundaries and surveys led to the need for a revision of the treaty, which was agreed upon in 1923 as part of the Williams Treaty, the text of which is below:

> *ARTICLES OF A TREATY made and concluded on the thirty-first day of October, in the year of Our Lord One thousand nine hundred and twenty-three, between His Most Gracious Majesty, George the Fifth, of the United Kingdom of Great Britain and Ireland, King, Defender of the Faith, Emperor of India, by His Commissioners: Angus Seymour Williams, of the City of Ottawa, in the Province of Ontario, Esquire, Barrister-at-law, and Departmental Solicitor of the Department of Indian Affairs; Robert Victor Sinclair, of the said City of Ottawa, Esquire, One of His Majesty's Counsel, learned in the law, and Uriah McFadden, of the City of Sault Sainte Marie, in the said Province, Esquire, one of His Majesty's Counsel learned in the law; the said Angus Seymour Williams, Chairman of the said Commission, representing the Dominion of Canada, and the said Robert Victor Sinclair and Uriah McFadden, representing the Province of Ontario, of the One Part; and the Members of the Chippewa Tribe, inhabiting, as members of Bands thereof, reserves at Christian Island, Georgina Island and Rama, all in the Province of Ontario, by their Chiefs and Headmen, of the Other Part.*
>
> *SECONDLY: All that parcel of land situate in the Province of Ontario and described as parts of the Counties of Northumberland, Durham, Ontario and York, commencing at the point where the easterly limit of that portion of the lands said to have been ceded in 1787, which was confirmed on the first day of August, 1805, of record as number thirteen in Volume I of the Book of Surrenders, intersects the northerly shore of Lake Ontario; thence northerly along the said easterly and northerly limits of the confirmed tract to the Holland River; thence northerly along the Holland River and along the westerly shore of Lake Simcoe and Kempenfelt Bay to the Narrows between Lake Couchiching and Lake Simcoe; thence southeasterly along the shores of Lake Simcoe to the Talbot River; thence easterly along the Talbot River to the boundary between the Townships of Victoria and Ontario; thence southerly along that boundary to the northwest angle of the Township of Darlington; thence along the northerly boundary line of the Townships of Darlington, Clarke, Hope and Hamilton to Rice Lake; thence along the southern shore of said lake to River Trent along the River Trent to the Bay of Quinte; thence westerly and southerly along the shore of the Bay of Quinte to the road leading to Carrying Place and Wellers Bay; thence westerly along the northern shore of Lake Ontario to the place of beginning; excepting thereout and therefrom those lands which have already been set aside as Indian reserves. The land hereby conveyed contains two thousand, five hundred square miles more or less.*

(Morris 1943:43)

Euro-Canadian Settler History

Home District

Following the Toronto Purchase, the Province of Quebec (which then included Ontario) was divided into four political districts: Lunenburg, Mechlenburg, Nassau, and Hesse. When the Province of Upper Canada was formed in 1791, the names of the four districts were changed to Eastern, Midland, Home, and Western, respectively. The study area fell within the Home District.

The Home District initially included all lands between an arbitrary line on the west running from Long Point on Lake Erie to Georgian Bay and a line on the east running north from Presqu'ile Point on Lake Ontario to the Ottawa River. In 1793, John Graves Simcoe, the first Lieutenant Governor of Upper Canada, further subdivided each district into counties and townships, and European settlement began shortly after (Hunter 1909).

Peterborough County and the City of Peterborough

The County of Peterborough is bound to the south by the Otonabee River, Rice Lake, and Trent River; on the east by the County of Hastings; on the west by the Counties of Durham and Victoria; and to the north by the County of Haliburton. While the terrain is gently undulating, it was initially covered in a mixed forest of oak, maple, pine, and birch.

The County was largely unsettled by Europeans prior to 1818. Samuel Wilmot first surveyed the area that includes the Township of Otonabee and the City of Peterborough in 1818. The first settlers arrived in 1819; a millwright named Adam Scott was among them. In 1821, Scott completed the construction of the first mill at the intersection of King and Water Streets. The area was then known as Scott's Plains, and each family who had arrived here was given a "cow, an axe, an auger, a handsaw, a hammer, 100 nails, 2 gimlets, 3 hoes, 1 kettle" (Ramoine 1875; 5). Scott and a few workers from the mill were the only residents of Peterborough until 1825 (Cole 1988:62). Peter Robinson, an early Canadian politician, organized settlement of the area with Irish immigrants in 1825. More than 2,500 Catholic immigrants from Ireland came to the County of Peterborough. They had three boats for transportation, 18 months' worth of government rations, and a set of supplies for each family. Each family received a cow, potatoes, corn, various tools, and cooking utensils. At first, the settlers created makeshift huts of sod and bark in Scott's Plains. Later, the Irish immigrants were relocated to their granted 100-acre properties, where many of them constructed semi-permanent small log shanties to replace their sod and bark huts (Wilmot 1818).

In 1819, an area was designated for the town of Peterborough. However, it was not until 1825 that Richard Birdsall, Esq. officially surveyed the town plot. Over time, the town grew through a series of annexations, absorbing areas of the surrounding townships. As the town expanded, the hastily-built log shanties with shingled roofs were eventually replaced by more permanent structures. The first schoolhouse was constructed in 1826. The government also aided in the construction of a dam, sawmill, and grist mill on the Otonabee River during the same year (Brunger 1985).

In 1827 the name Scott's Plains was changed to Peterborough in honour of Peter Robinson, who had organized the first major influx of settlers in 1825 (Jones 2015). At this time, the town of Peterborough was part of Township of Monaghan. The Otonabee River formed its eastern boundary, while the eastern side of the river belonged to the Township of Otonabee.

By 1838, the town had two grist mills, two saw mills, two distilleries, one brewery, one tannery, four churches, one school, and its first stone house (Poole 1867:41). The square timber industry was beginning to develop in Peterborough and the surrounding areas. The population in 1838 was estimated to be no more than eight or nine hundred. In 1850, Peterborough was incorporated as a town, as populations increased (Jones 2015). By 1852 the population had more than doubled to 2,191 and doubled again in 1871 when the population reached 4,611 (Cole 1988).

The first steamboats, the Pemedash and the Northumberland, arrived in Rice Lake in 1832-33. Regular trips between Rice Lake and Peterborough were made possible by these boats. In 1833, N.H. Baird, Esq. surveyed the Otonabee River and connected bodies of water to create a navigable waterway between the Bay of Quinte and Lake Simcoe. However, by the early 1850s, the expansion of railways reduced the dependence on water power for transportation of goods and communication (Adams and Taylor 1985:109).

In 1854, a rail line connecting Cobourg and Peterborough was established, with construction beginning two years prior in 1852. Unfortunately, just two days after the maiden journey of the C&P rail, the rail line suffered trestle damage from ice movement. This was a recurring issue with the rail line and required expensive annual repairs. In 1867, a rich bed of iron ore was discovered near Marmora, and a rail line was constructed at Trent Narrows to transport it. However, by 1893, the iron ore had been depleted, and the rail line was permanently closed. At the start of the First World War, the rails were removed and sent to France to contribute to the war efforts (Brown 2011:33).

In the 1870's, Peterborough was Ontario's principal timber producer, shipping over 236,000 m^3 to American wholesalers, annually. Subsequently, the development of hydroelectricity along the Trent water system, attracted large manufacturers to the area (Jones 2015). The town of Peterborough was a hub for foreign-owned industries and boasted an industrial workforce that was second only to Toronto. The town's industries primarily focused on manufacturing electrical appliances (first known as Edison Electric and later Canadian General Electric), breakfast cereals (Quaker Oats), processed meat, cord and twine, woolens, hardware and tools, small motors, boats, clocks and watches, professional and scientific equipment, as well as medical and hospital supplies (Adams and Taylor 1985:111).

The construction of the Trent Canals was crucial for the growth and success of Peterborough. The project aimed to connect Lake Ontario to Lake Huron through inland waterways but faced many challenges during the early and mid-19th century. Finally, by 1884, work began, and locks and dams were built at Fenelon Falls, Buckhorn, Lovesick Lake, and Burleigh Falls. This provided a direct route between Lakefield, Balsalm Lake,

and Lindsay, thus making transportation more accessible and efficient (Stewart 1902; ixxxviii). In the following decades, additional sections were constructed between Peterborough and Lakefield, as well as Balsam Lake and Kirkfield. At the time of its construction, the hydraulic lift lock at Ashburnham was the largest of its kind in the world (Stewart 1902; lxxxix).

As Peterborough expanded, it annexed surrounding land. In 1902, the Village of Ashburnham, situated on the eastern shores of the Otonabee River, became a part of Peterborough. Two years later, in 1904, the population of Peterborough had grown to a point where it officially acquired the status of a city. In that same year, the City of Peterborough purchased 100 acres of land from Smith Township to gain better access to the Otonabee River lumber industry, which included the junction of Water, Hilliard, and Langton Streets. By 1905, Peterborough had incorporated as a city with a population of 78,698 people (Jones 2015). Map 4 illustrates the historic transportation routes within the study area.

Township of Cavan-Monaghan

The townships of Cavan and Monaghan were surveyed in 1817 by John Deyell. They were named after the Irish counties of County Cavan and County Monaghan, from which many settlers had emigrated. In 1819, there were 244 settlers in the area, and the population had increased to 4,901 by 1861. Many of the settlers were descendants of United Empire Loyalists or veterans of the War of 1812 who were granted land there, as well as the original and later settlers from Ireland. However, after the Confederation of Canada in 1867, the population declined as many families left for Western Canada (Millbrook Historical Society n.d).

Previously part of Durham County, the Township of Cavan and the Village of Millbrook, became part of Peterborough County in 1974 and were amalgamated with North Monaghan into one township – Cavan-Millbrook-North Monaghan – in 1998. In 2007, the township was renamed the Township of Cavan-Monaghan (Township of Cavan-Monaghan 2023).

Township of Otonabee-South Monaghan

Located along the Trent-Severn Waterway, to the north shore of Rice Lake, Otonabee-South Monaghan Township was formed on January 1, 1998, through the amalgamation of Otonabee and South Monaghan Townships (Township of Otonabee-South Monaghan 2023).

Archaeological Context

Archaeological Sites and Previous Assessments

The registered archaeological site records kept by the MCM were consulted so that an inventory of archaeological resources could be compiled. In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database maintained by the MCM. This database contains archaeological sites registered according to the Borden system. Under the Borden system, Canada is divided into grid blocks based on latitude and longitude. A Borden block is approximately 13km east to

west and approximately 18.5km 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 is located within Borden blocks, *BcGn, BbGp, BbGo, BcGo, BbGn,* and *BbGm.*

According to Section 7.5.8, Standard 1 of the Standards and Guidelines, all registered or known archaeological sites within a minimum one-kilometre distance from the study area must be listed. A considerable amount of archaeological research ahs been undertaken in the region and had resulted in the discovery of an array of archaeological resources with a variety of cultural affiliations (Map 3). A total of 106 archaeological sites are registered within the study area and within 1 km of the study area limits (Table 2).

TABLE 2: REGISTERED ARCHAEOLOGICAL SITES WITHIN THE STUDY AREA AND WITHIN 1 KM OF THE STUDY AREA

Borden Number	Site Name	Time Period	Affinity	Site Type	Current Development Review Status
BcGo-6	Nurse	Post-Contact	Euro-Canadian	homestead	-
BcGo-32	-	Post-Contact, Woodland	Euro-Canadian, Indigenous	Unknown	Further CHVI
BcGo-3	Michael Collins	Post-Contact	Euro-Canadian	homestead	-
BcGo-28	-	Woodland, Late	Anishinaabeg	camp / campsite	Further CHVI
BcGo-24	Milburn Site	Post-Contact	Euro-Canadian	homestead	Further CHVI
BcGo-22	-	Paleo-Indian	Indigenous	scatter	No Further CHVI
BcGo-21	Montgomery	Post-Contact	Euro-Canadian	midden	No Further CHVI
BcGo-2	Laidlaw 9	-	-	-	-
BcGo-1	Champlain's Rest	Post-Contact	Iroquoian	Other camp/campsite	-
BcGn-31	-	Post-Contact	Indigenous, Euro-Canadian	farmstead	Further CHVI
BcGn-30	-	Woodland, Middle	Indigenous	findspot	No Further CHVI
BcGn-29	Location 2	Woodland	Indigenous	camp / campsite	Further CHVI
BcGn-28	Location 1	Woodland, Middle	Indigenous	camp / campsite	Further CHVI
BcGn-27	Bineshiinh Asin	Pre-Contact	Indigenous	Unknown	Further CHVI

BcGn-26	Trent Maintenance Yard	Post-Contact	Euro-Canadian	homestead, house	No Further CHVI
BcGn-25	-	Post-Contact	Euro-Canadian	scatter	No Further CHVI
BcGn-24	Tullibee	Archaic, Late	Indigenous	hunting	No Further CHVI
BcGn-23	Nassau Structure 1	Post-Contact	Euro-Canadian	farmstead, house, manufacturing	Further CHVI
BcGn-22	-	Post-Contact	Euro-Canadian	farmstead	No Further CHVI
BcGn-21	-	Post-Contact, Pre-Contact	-	Other Possible secondary deposit of material included in levelling fill., findspot	No Further CHVI
BcGn-20	Railway House	Post-Contact	Euro-Canadian	agricultural, farmstead, house, log	No Further CHVI
BcGn-19	-	Post-Contact	-	-	-
BcGn-17	Pioneer Road	Post-Contact	Euro-Canadian	scatter	Further CHVI
BcGn-16	-	Post-Contact	Euro-Canadian	Other building, use unknown	Further CHVI
BcGn-15	-	Post-Contact	Euro-Canadian	house	Further CHVI
BcGn-14	-	Post-Contact	Euro-Canadian	Unknown	No Further CHVI
BcGn-13	Waverly Heights	Paleo-Indian	Indigenous	camp / campsite	No Further CHVI
BcGn-12	Nassau?/Perry Mill	Post-Contact	Euro-Canadian	mill	-
BcGn-11	Red Mill	Post-Contact	Euro-Canadian	mill	-
BbGp-7	-	-	-	-	-
BbGp-6	Rondo Valley Ranch	-	-	-	-
BbGp-5	-	-	-	-	-
BbGp-4	-	-	-	-	-
BbGp-17	-	Pre-Contact	-	scatter	Further CHVI
BbGp-16	-	Woodland, Late	Iroquoian, Mississauga	camp / campsite	Further CHVI
BbGp-13	Wilson	Woodland, Late	Huron-Wendat	village	-
BbGp-12	Bark	Post-Contact,	Indigenous, Euro-Canadian,	ossuary, village	-

		Woodland, Late	Huron-Wendat, Iroquoian		
BbGo-8	Anderson	Archaic	Indigenous	findspot	-
BbGo-7	Jameson	Pre-Contact	Indigenous	findspot	-
BbGo-6	Foster	Pre-Contact	Indigenous	findspot	-
BbGo-5	Seeney	-	-	-	-
BbGo-39	22-085MC1	Post-Contact	Euro-Canadian	Unknown	Further CHVI
BbGo-37	Webster Site	Post-Contact	Euro-Canadian	farmstead	Further CHVI
BbGo-36	Smyth Site	Post-Contact	Euro-Canadian	agricultural, homestead	Further CHVI
BbGo-33		Other, Pre-Contact	Indigenous, Unknown	Unknown	No Further CHVI
BbGo-32	Springville Heights	Archaic, Early	Indigenous	findspot, hunting	No Further CHVI
BbGo-29	Clark Homestead	Post-Contact	-	farmstead, homestead	Further CHVI
BbGo-27	Park hill road	-	-	-	-
BbGo-26	Lily Lake	Woodland	-	Other camp/campsite, village	-
BbGo-25	Tate Farm	Pre-Contact	Indigenous	Unknown	-
BbGo-24	Springville	Post-Contact	Euro-Canadian	homestead	-
BbGo-23	Douglass	Post-Contact	Euro-Canadian	Unknown	-
BbGo-22	Midfield	Pre-Contact	-	-	-
BbGo-21	Golden Sand	Post-Contact	Euro-Canadian	cabin	No Further CHVI
BbGo-20	Big Mosquito	Pre-Contact	Indigenous	Othercamp/campsite	No Further CHVI
BbGo-19	Big Tree	Pre-Contact	Indigenous	hunting	Further CHVI
BbGo-18	-	Post-Contact	Euro-Canadian	homestead	-
BbGo-17	Kawartha Downs 3	Post-Contact	Euro-Canadian	Unknown	Further CHVI
BbGo-16	Kawartha Downs 2	Archaic, Late	Indigenous	Unknown, findspot	No Further CHVI
BbGo-15	Kawartha Downs 1	Archaic, Late	Indigenous	findspot	No Further CHVI

BbGo-14	Bartlett	Pre-Contact	Indigenous	scatter	-
BbGo-13	Intersports	Post-Contact	Euro-Canadian	homestead	-
BbGo-10	McCreef	Post-Contact	Euro-Canadian	homestead	-
BbGn-44	TSW Site 1	Post-Contact	-	scatter	No Further CHVI
BbGn-43	McCabe	Post-Contact	Euro-Canadian	midden	No Further CHVI
BbGn-42	Bird	Post-Contact	Euro-Canadian	midden	No Further CHVI
BbGn-41	-	Woodland, Early	Indigenous	Unknown	No Further CHVI
BbGn-40	LGM	Archaic, Early	-	findspot	No Further CHVI
BbGn-39	Ashborough 2	Post-Contact	-	OtherRefuse/discard areas, agricultural, farmstead	No Further CHVI
BbGn-38	Ashborough 1	Post-Contact	-	OtherRefuse/discard areas, agricultural, homestead	No Further CHVI
BbGn-37	Technology Drive	Post-Contact	Euro-Canadian	midden	No Further CHVI
BbGn-36	Harvey	Post-Contact	Euro-Canadian	homestead	No Further CHVI
BbGn-34	-	Woodland, Early, Woodland, Middle	Indigenous	trail	-
BbGn-31	-	Post-Contact	Euro-Canadian	homestead	No Further CHVI
BbGn-30	-	Post-Contact	Euro-Canadian	cabin	-
BbGn-3	Brock Street Burials	Woodland, Middle	-	burial	-
BbGn-29	-	Archaic, Middle, Woodland, Early	Indigenous	Other camp/campsite	-
BbGn-28	-	Woodland, Early	Indigenous	Unknown	-
BbGn-25	Dutton	Post-Contact	Euro-Canadian	midden	No Further CHVI
BbGn-24	Bandana	Archaic	Indigenous	Unknown	-
BbGn-23	Baby Bird	Post-Contact	Euro-Canadian	midden	-
BbGn-22	Otonabee Point 2	Post-Contact	Euro-Canadian	Unknown, homestead, midden	Further CHVI

BbGn-21	Otonabee Point 1	Pre-Contact	Indigenous	Unknown	No Further CHVI
BbGn-19	-	Post-Contact	Euro-Canadian	homestead	-
BbGn-18	Hill	Post-Contact	Euro-Canadian	homestead, midden	-
BbGn-16	Peterborough County Jail	Post-Contact	Euro-Canadian	burial, cemetery, jail	-
BbGn-15	-	Post-Contact	Euro-Canadian	Other building, Unknown	-
BbGn-11	-	-	-	-	-
BbGn-1	Auburn	-	-	-	-
BbGm-9	East Grape Island	Post-Contact, Woodland, Middle	Indigenous, Iroquoian	Other camp/campsite, burial	-
BbGm-8	Hickory Island	Archaic, Early, Woodland, Middle	Indigenous	Other camp/campsite	-
BbGm-6	Loucks Point	Archaic, Middle, Woodland, Late, Woodland, Middle	Indigenous, Iroquoian	village	-
BbGm-55	Anderson Graham site	Post-Contact	Euro-Canadian	farmstead	No Further CHVI
BbGm-54	-	Post-Contact	Euro-Canadian	midden	Further CHVI
BbGm-39	-	Archaic, Early, Archaic, Middle, Woodland, Woodland, Early	Indigenous	Unknown	-
BbGm-36	-	Post-Contact	Euro-Canadian	farmstead	-
BbGm-35	-	Post-Contact	Euro-Canadian	farmstead	-
BbGm-23	Island Centre	Woodland	Indigenous	Other camp/campsite	-
BbGm-22	Poison Ivy	Archaic, Woodland	Indigenous	Other camp/campsite	-
BbGm-21	John	Archaic	Indigenous	Other camp/campsite	-
BbGm-20	Corral	Woodland	Indigenous	Other camp/campsite	-

BbGm-19	Alderville	-	-	-	-
BbGm-16	Grasshopper Island	-	-	-	-
BbGm-14	Foley Point	Archaic, Early, Archaic, Late, Archaic, Middle, Woodland, Early, Woodland, Middle	Indigenous	village	-
BbGm-12	Godfrey Point	Archaic, Early, Woodland, Early, Woodland, Middle	Indigenous	Other camp/campsite	-
BbGm-11	East Sugar Island	Woodland, Late	Iroquoian	Other camp/campsite, burial	-

'-' denotes unavailable information

The Natural and Physical Environment

The study area is situated within the Peterborough drumlin field physiographic region, which is described as:

> *…rolling till plain with an area of about 1750 square miles. Extending from Hastings County in the east to Simcoe County in the west, and including the drumlins south of the moraine in Northumberland County, this belt contains approximately 3000 good drumlins in addition to many other drumlinoid hills and surface flutings of the till sheet. For the most part the rock underlying this region is limestone of the Lindsay and Verulam Formations which are somewhat softer and less massive formations than the Gull River Formation. They are also highly fossiliferous and disintegrate easily. The drumlins throughout are composed of highly calcerous till but there are local differences.*
>
> Chapman and Putnam 1984:170

The soils of the study area consist predominately of the Bondhead, Foxboro, Granby, and Tioga soil complexes. The largest area of Bondhead soils is located north of the eastern edge of Rice Lake. This area is characterized by steep-sided drumlins on a gently sloping moraine base. This soil complex is well drained, with varying stone inclusions. The Bondhead soil complex is variable in their agricultural potential and are well suited for a variety of crops (Gillespie and Acton 1981).

The Foxboro soil complex are poorly drained, generally occurring in river floodplains and in the channels between drumlins. Despite the soils being generally poorly drained,

this soil complex produces good crops of hay and grain. The Foxboro soil complex is generally under tree cover of cedar, balsam, white birch, elm, white ash, and soft maple (Gillespie and Acton 1981).

Similar to the Foxboro soil complex, Granby soils are also poorly drained and have limited agricultural potential. These soils are fair for hay crops; however, they are poor for grain crops. The topography of the Granby soil complex is level to slightly depressional.

The Tioga soil complex is well-drained, with a smooth to gently sloping topography. Primarily located in North Monaghan Townships with small pockets in Otonabee Townships. These soils are fair soils for growing a variety of field crops, small fruits, and vegetables.

Potable water sources are present within the study area, notably the Otonabee River flowing through the extent of the study area along with several smaller tributaries of the Otonabee River, such as Jackson Creek, Lily Lake and Whitlaw Creek. The Otonabee River flows into Rice Lake approximately 8 km south of the study area. Chemong Lake is approximately 5 km north of the study area. Map 5 illustrates water-based archaeological potential within the study area.

Record of Documentation

The purpose of this section is to document all finds according to the standards (MCM Section 7.8.2). An inventory of the documentary record generated by the property Inspection is provided in Table 3 (MCM Section 7.8.2 Standard 2).

TABLE 3: RECORD OF DOCUMENTATION

Document Type	Location of Document	Additional Comments	Quantity
Field Notes	PHC Office	2 typed files stored in project file	7 pages
Maps Provided by Client	PHC Office	In project file (Site Map)	22 maps

A property inspection was not performed as part of this Stage 1 assessment.

Analysis and Conclusion

Archaeological Potential

Archaeological Potential for the Study Area

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. In accordance with the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* the following are features or characteristics that indicate archaeological potential:

- Previously identified archaeological sites;
- Water sources:

1. Primary water sources (lakes, rivers, streams, creeks);
2. Secondary water sources (intermittent streams and creeks; springs; marshes; swamps);
3. Features indicating past water sources (e.g. glacial lake shorelines indicated by the presence of raised gravel, sand, or beach ridges; relic river or stream channels indicated by clear dip or swale in the topography; shorelines of drained lakes or marshes; and cobble beaches);
4. Accessible or inaccessible shoreline (e.g. high bluffs, swamps or marsh fields by the edge of a lake; sandbars stretching into marsh);

- Elevated topography (eskers, drumlins, large knolls, 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:

1. Food or medicinal plants;
2. Scarce raw minerals (e.g. quartz, copper, ochre or outcrops of chert);
3. Early Euro-Canadian industry (fur trade, mining, logging);
4. Areas of Euro-Canadian settlement; and,
5. Early historical transportation routes.

In recommending a Stage 2 property survey based on determining archaeological potential for a study area, MCM stipulates the following:

- No areas within 300 metres of a previously identified site; water sources; areas of early Euro-Canadian Settlement; or locations identified through local knowledge or informants can be recommended for exemption from further assessment;

- No areas within 100 metres of early transportation routes can be recommended for exemption from further assessment; and,
- No areas within the property containing an elevated topography; pockets of well-drained sandy soil; distinctive land formations; or resource areas can be recommended for exemption from further assessment.

Archaeological Integrity

A negative indicator of archaeological potential is extensive land disturbance. This includes widespread earth movement activities that would have eradicated or relocated any cultural material to such a degree that the information potential and cultural heritage value or interest has been lost.

Section 1.3.2 of the MCM 2011 Standards and Guidelines for Consultant Archaeologists states that:

> *Archaeological potential can be determined not to be present for either the entire property or a part(s) of it when the area under consideration has been subject to extensive and deep land alterations that have severely damaged the integrity of any archaeological resources (MCM 2011:18)*

The types of disturbance referred to above include, but are not restricted to, quarrying, sewage and infrastructure development, building footprints, and major landscaping involving grading below topsoil.

Potential Archaeological Resources

Following the criteria outlined above to determine archaeological potential, the study area is considered to exhibit low archaeological potential for the following reasons:

- 100+ archaeological sites are present within the study area and within 1 km of the study area (Map 2).
- Several historical transportation routes have been identified within the study area (Map 3).
- The Trent-Severn Waterway is located within the study area (Map 4).
- Several waterbodies within the study area and adjacent to the study area used as historical transportation routes (Map 4).
- The soils of the study area would have been suitable for Indigenous and Euro-Canadian agricultural practices.

While areas of previous disturbance eliminate the potential for the recovery of archaeological resources (Section 1.3.5.1), areas with no previous disturbance or only surficial previous disturbance retain their archaeological potential. Maps 5 and 6 illustrate areas of land and water-based archaeological potential. Maps 7 through 20 provide detailed mapping showing the areas of archaeological potential with the study area. Areas with archaeological potential are recommended for Stage 2 Archaeological assessment.

Conclusion

Based on the data gathered from the background research, a model was developed to gain a more comprehensive understanding of the inventory of record archaeological resources. The model takes into account the inclusion of areas in proximity to critical water sources and waterways. The resulting predictive model highlights the locations where unrecorded archaeological sites are most likely to be found. To illustrate the archaeological potential model by the urban areas that make up the study area, a series of overlapping detailed maps are provided (Maps 6 through 20). Given the size of the study area, these maps help to provide a more accurate depiction of the potential for archaeological resources to be present across various portions of the study area.

TABLE 4: DETAILED ARCHAEOLOGICAL POTENTIAL MAPPING FOR URBAN AREAS

Ward	Map Title	Map Number
Otonabee	Otonabee Detail 1 of 2	Map 8
	Otonabee Detail 2 of 2	Map 9
Monaghan	Monaghan Detail 1 of 1	Map 10
	Monaghan Detail 2 of 1	Map 11
Town	Town Detail 1 of 1	Map 12
Ashburnham	Ashburnham Detail 1 of 5	Map 13
	Ashburnham Detail 2 of 5	Map 14
	Ashburnham Detail 3 of 5	Map 15
	Ashburnham Detail 4 of 5	Map 16
	Ashburnham Detail 5 of 5	Map 17
Northcrest	Northcrest Detail 1 of 3	Map 18
	Northcrest Detail 2 of 3	Map 19
	Northcrest Detail 3 of 3	Map 20

Recommendations

Given the findings of the Stage 1 archaeological assessment of the study area, the following recommendations are made:

- The portions of the study area that retain archaeological potential as illustrated on Map 6, and detailed study area mapping (Maps 7 to 20) are recommended for Stage 2 archaeological assessment prior to future ground disturbance.
- All Stage 2 archaeological assessments should be conducted by a licensed consultant archaeologist and follow the requirements set out in the MCM's *Standards and Guidelines for Consultant Archaeologists* (2011).
- Agricultural areas recommended for Stage 2 archaeological assessment should be subject to pedestrian survey at 5 m intervals per Section 2.2.1, while non-agricultural lands should be subject to test pit survey at 5 m intervals per Section 2.1.2 of the MCM's *Standards and Guidelines for Consultant Archaeologists* (2011)
- Portions of the Study Area identified as disturbed (previous construction and/or grading activities) may not have had all potentially archaeological soils removed, particularly within the more urbanized study area. The Stage 1 background research did not adequately account for all potential previous disturbances in the archaeological potential model, as shown in Maps 5 to 20. Additional Stage 2 archaeological assessment, or construction monitoring is required to make determinations about the severity of previous impacts as they relate to archaeological potential assessments.

It is requested that this report be entered into the Ontario Public Register of Archaeological Reports, as provided for in Section 65.1 of the Ontario Heritage Act.

Advice on Compliance with Legislation

Advice on the compliance with legislation is not part of the archaeological record. However, for the benefit of the proponent and approval authority in the land use planning and development process, the report must include the following standard statements (MCM 2011, Section 7.5.9 Standard 1):

- This report is submitted to the Minister of Citizenship and Multiculturalism as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c O.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 fieldwork and report recommendations ensure the conservation, protection, and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of 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 fieldwork on the site, submitted a report to the Minister stating 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 representative of a new archaeological site or sites 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 Section 48(1) of the Ontario Heritage Act.
- The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

As per MCM *Standards and Guidelines for Consultant Archaeologists* (MCM 2011, Section 7.5.9 Standard 2):

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

Closure and Study Limitations

This report was prepared by Parslow Heritage Consultancy Inc. (PHC) for the exclusive use of GM BluePlan Engineering Ltd, on behalf of the City of Peterborough to inform a Class Environmental Assessment for the City of Peterborough Sanitary Master Plan. The study area encompasses the City of Peterborough, the Township of Cavan-Monaghan, and the Township of Otonabee-South Monaghan. The City of Peterborough is designated into five wards; Otonabee (Ward 1), Monaghan (Ward 2), Town (Ward 3), Ashburnham (Ward 4), and Northcrest (Ward 5).

All information, recommendations and opinions provided in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without the Client's or PHC's express written consent. Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the Client in the design of the specific project. Special risks occur whenever archaeological investigations are applied to identify subsurface conditions and even a comprehensive investigation, sampling and testing program may fail to detect all or certain archaeological resources. The sampling strategies incorporated in this study, if any, comply with those identified in the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (2011).

Prepared by:

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Project Manager

Reviewed By:

Adam Long, M.Sc (P1153)

Senior Archaeologist and Project Manager

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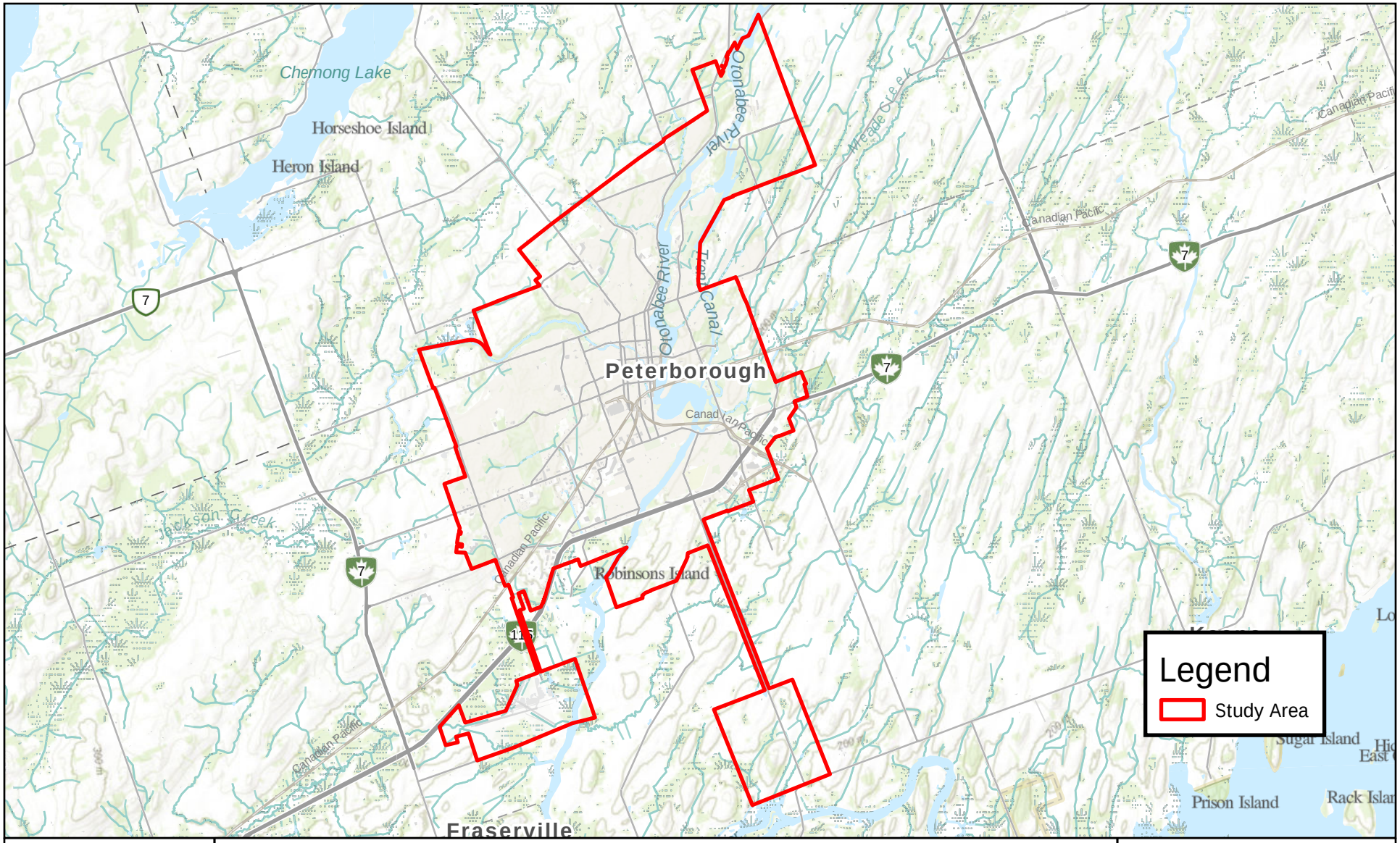
WILMOT, SAMUEL

1818B PLAN OF THE POINT OF LAND IN THE REAR OF THE TOWNSHIP OF MANAGHAN. SURVEY MAP DATED SEPTEMBER 24, 1818. ON FILE WITH THE MINISTRY OF NATURAL RESOURCES CROWN LAND SURVEY RECORDS OFFICE, PETERBOROUGH, ONTARIO.

Maps

ALL MAPS ON PROCEEDING PAGES



Peterborough Sanitary Masterplan Stage 1

Map 1: Study Area Boundary

Esri, NASA, NGA, USGS, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, NRCan, Parks Canada

Coordinate System: NAD 1983 UTM Zone 17N

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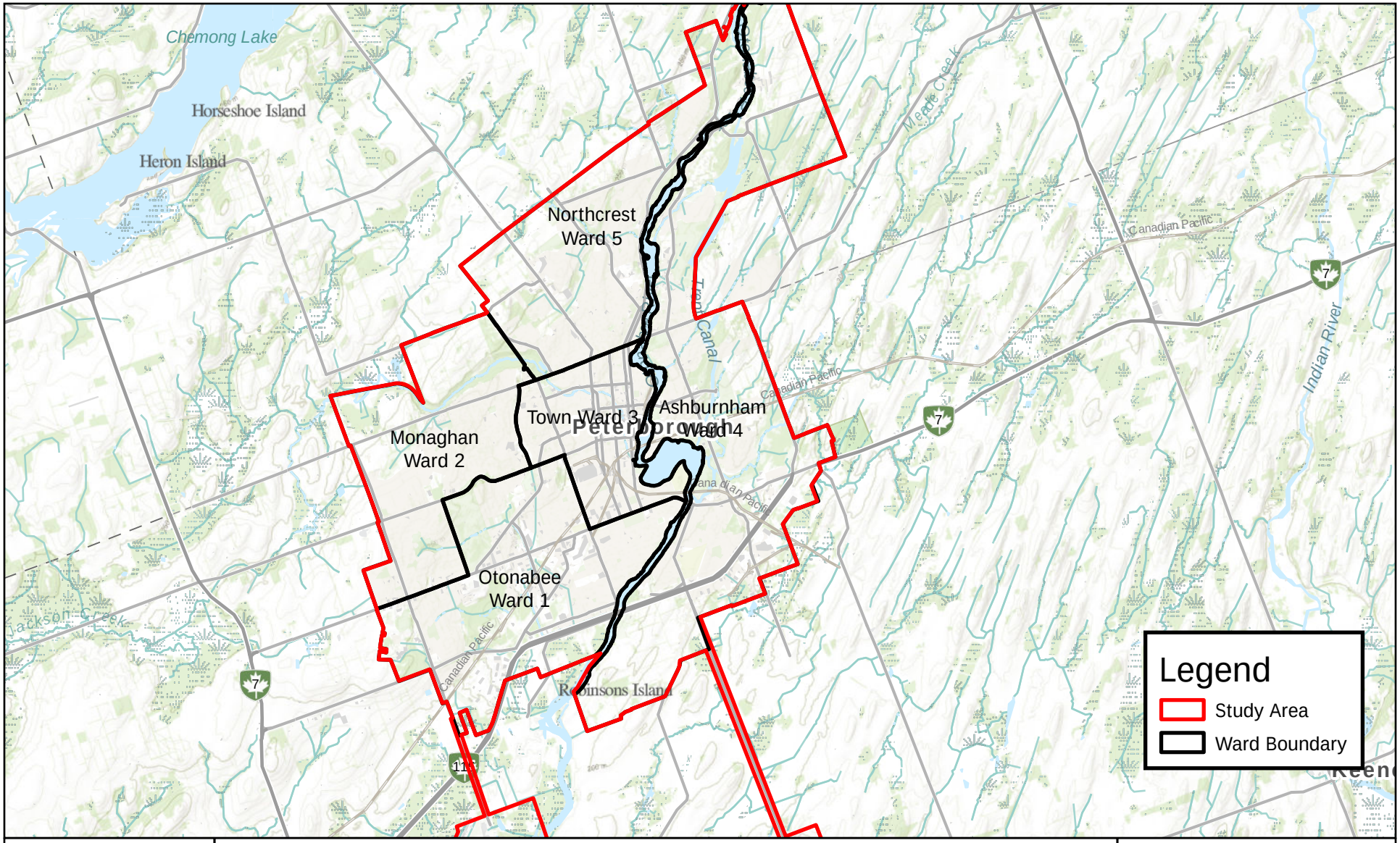

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Map 2: Peterborough Ward Boundaries

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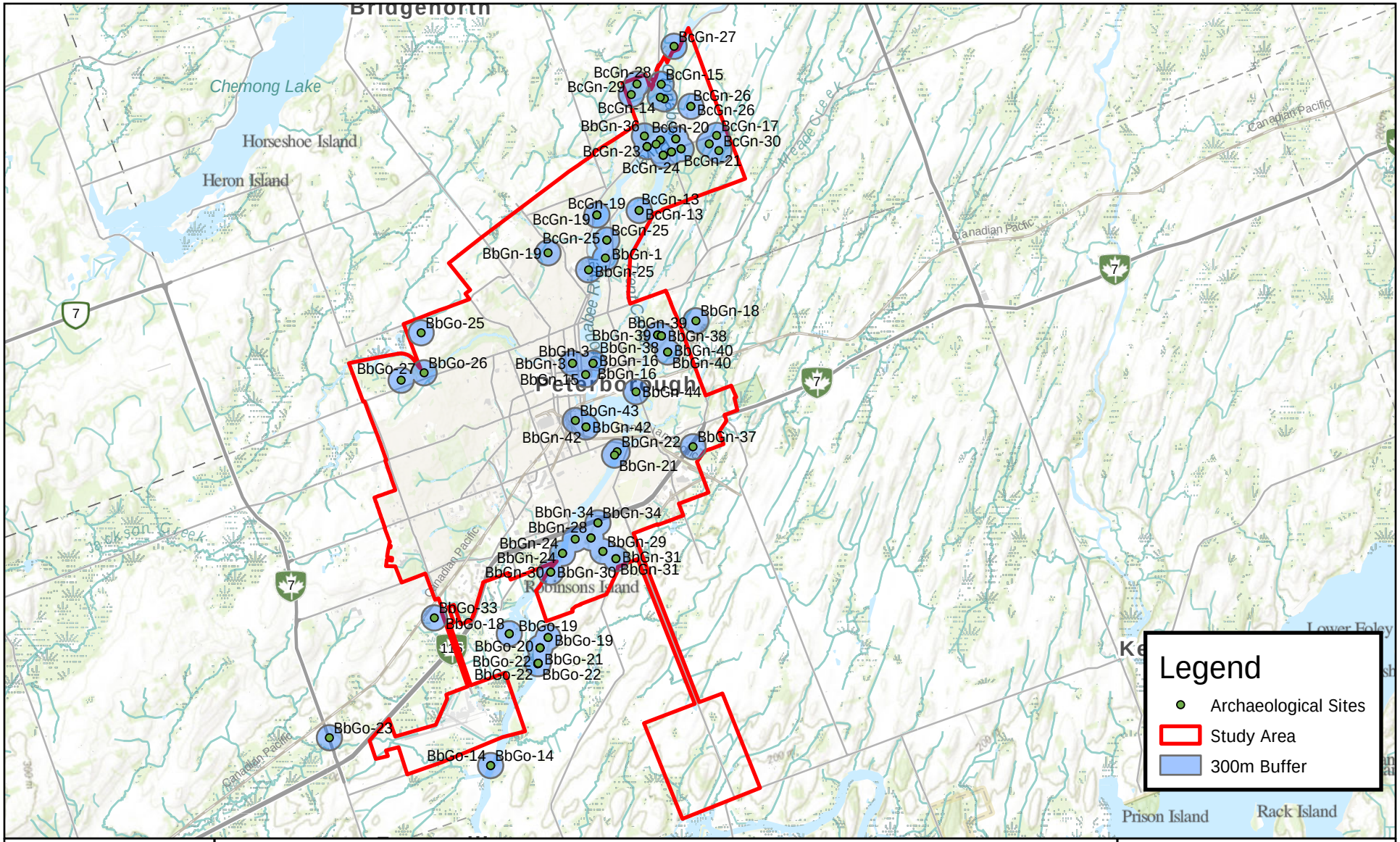

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Map 3: Archaeological Sites

Esri, NASA, NGA, USGS, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, NRCan, Parks Canada

Coordinate System: NAD 1983 UTM Zone 17N

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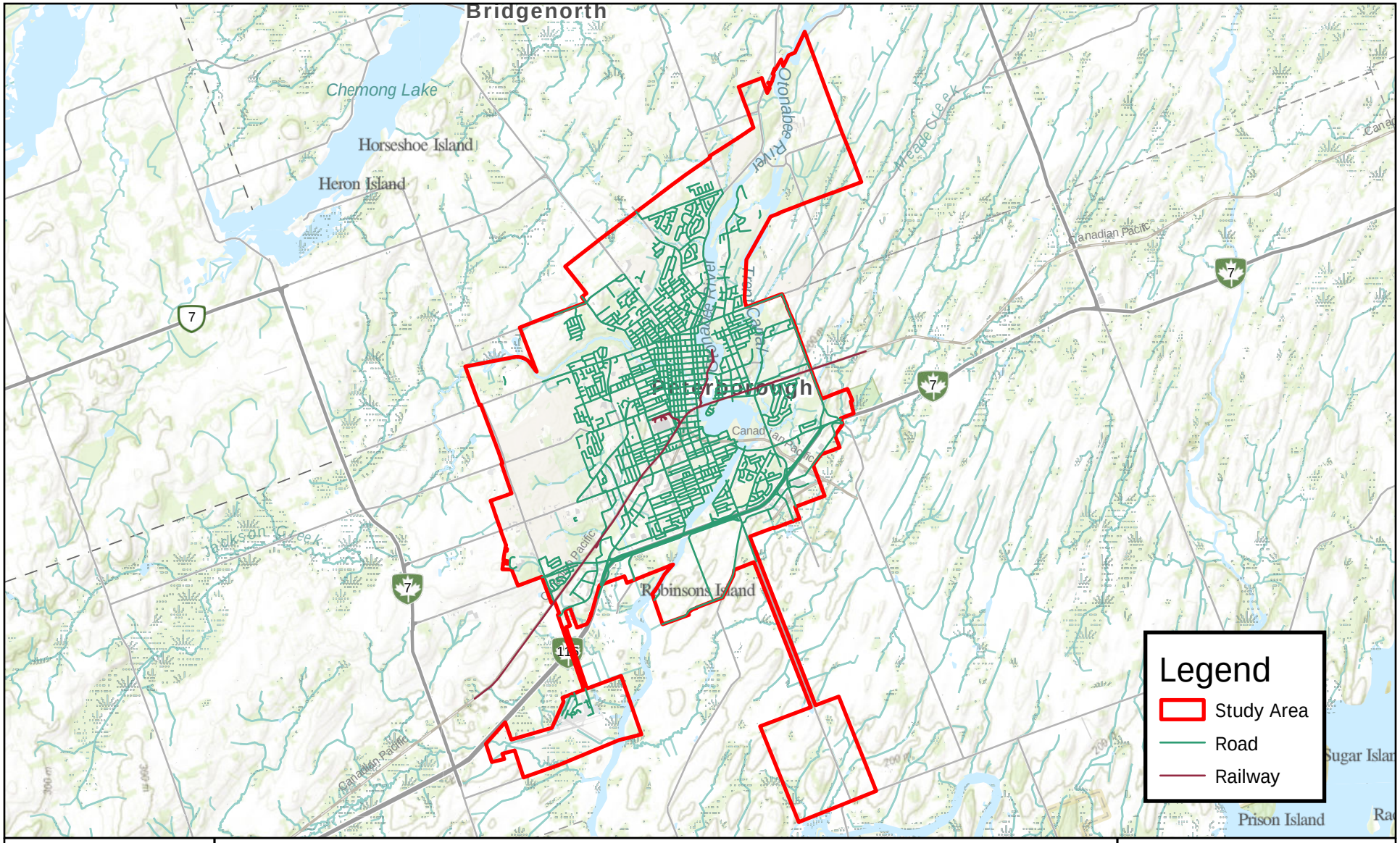

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Map 4: Historic Transportation Routes

Esri, NASA, NGA, USGS, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, NRCan, Parks Canada

Coordinate System: NAD 1983 UTM Zone 17N

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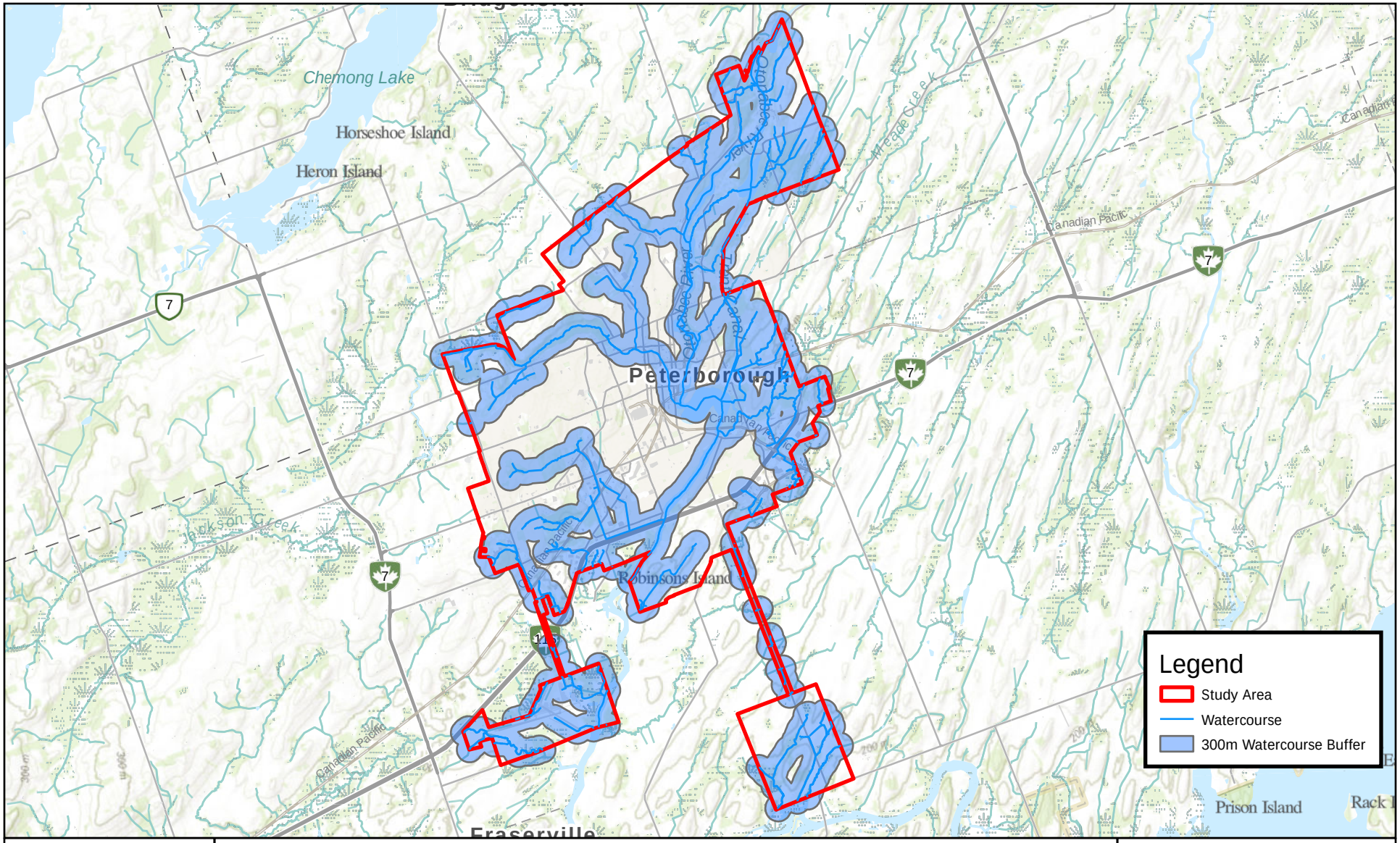

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Map 5: Water-based Archaeological Potential

Esri, NASA, NGA, USGS, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, NRCan, Parks Canada

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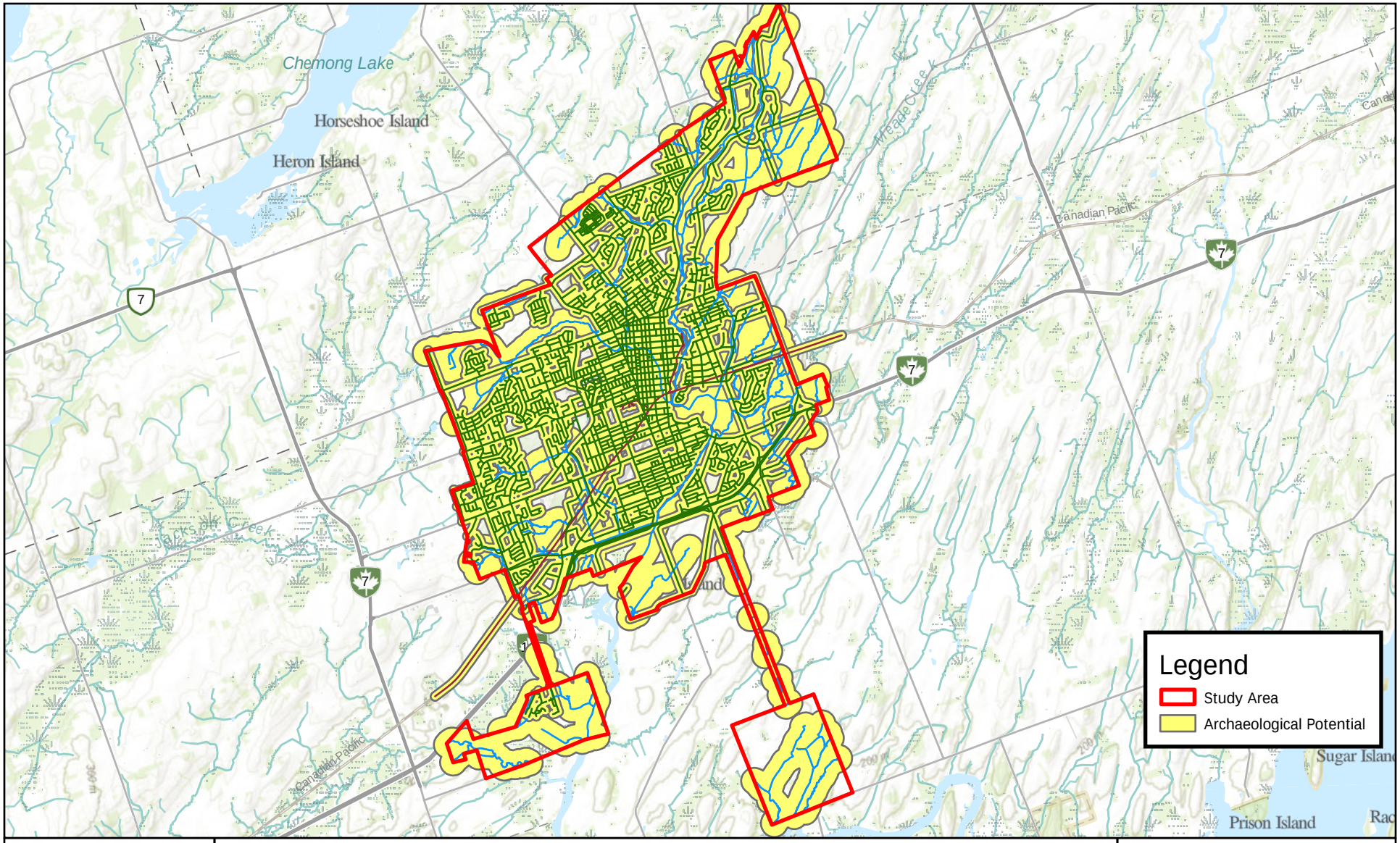

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Map 6: Archaeological Potential

Esri, NASA, NGA, USGS, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, NRCan, Parks Canada

Coordinate System: NAD 1983 UTM Zone 17N

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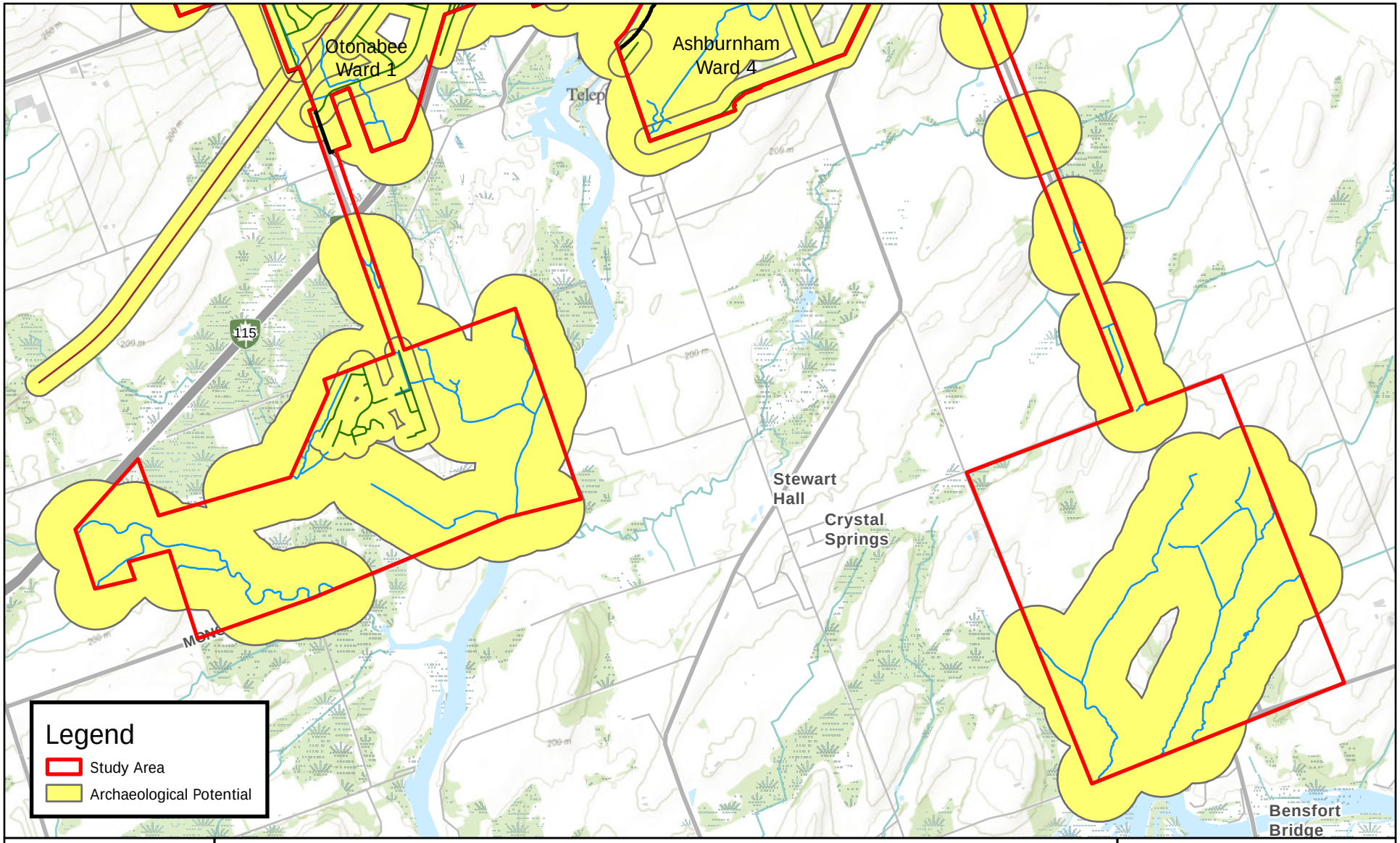

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Map 7: Archaeological Potential-Detail

Esri, NASA, NGA, USGS, FEMA, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, NRCan, Parks Canada

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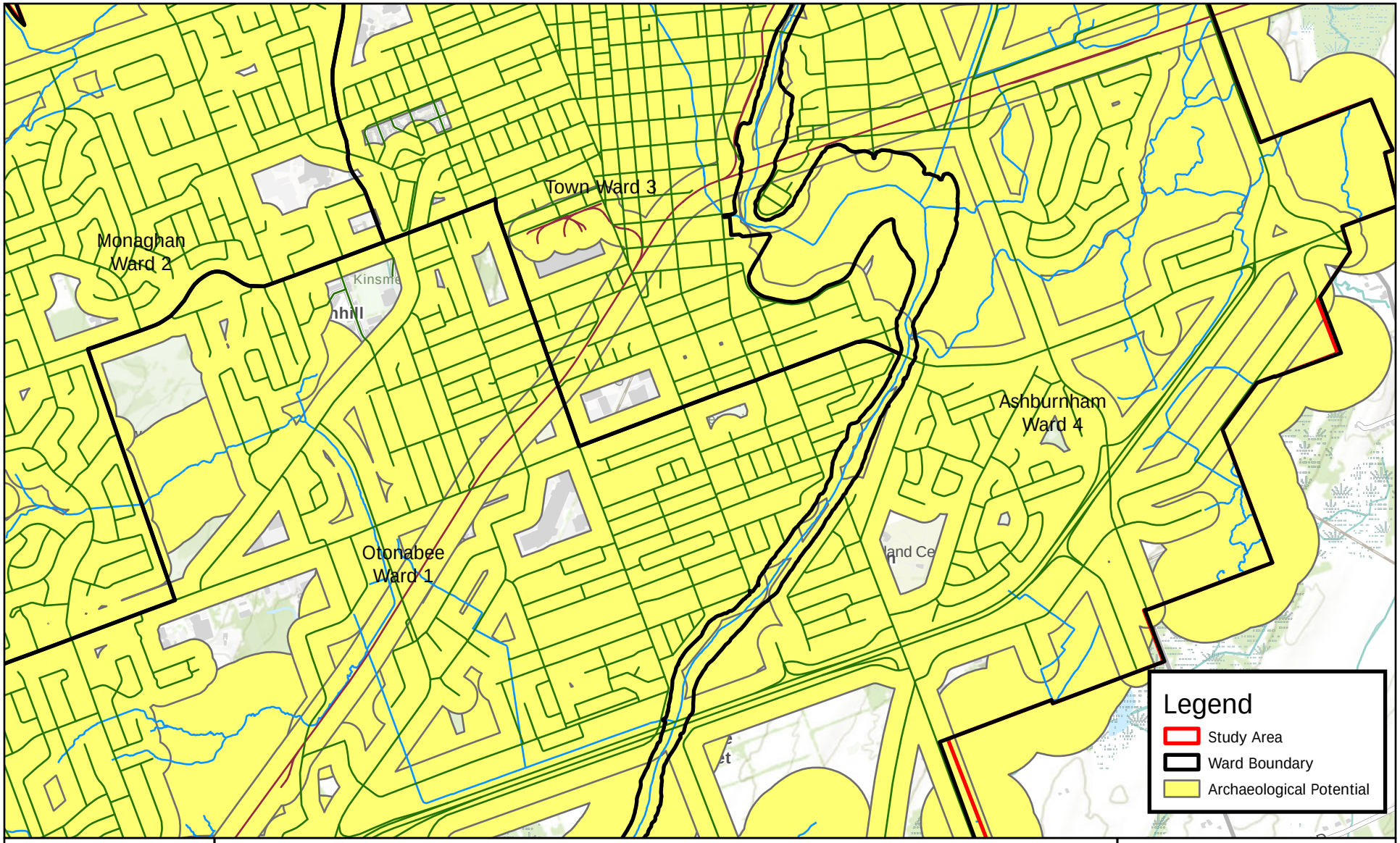

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Map 8: Otonabee Detail 1 of 2

Esri, NASA, NGA, USGS, FEMA, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

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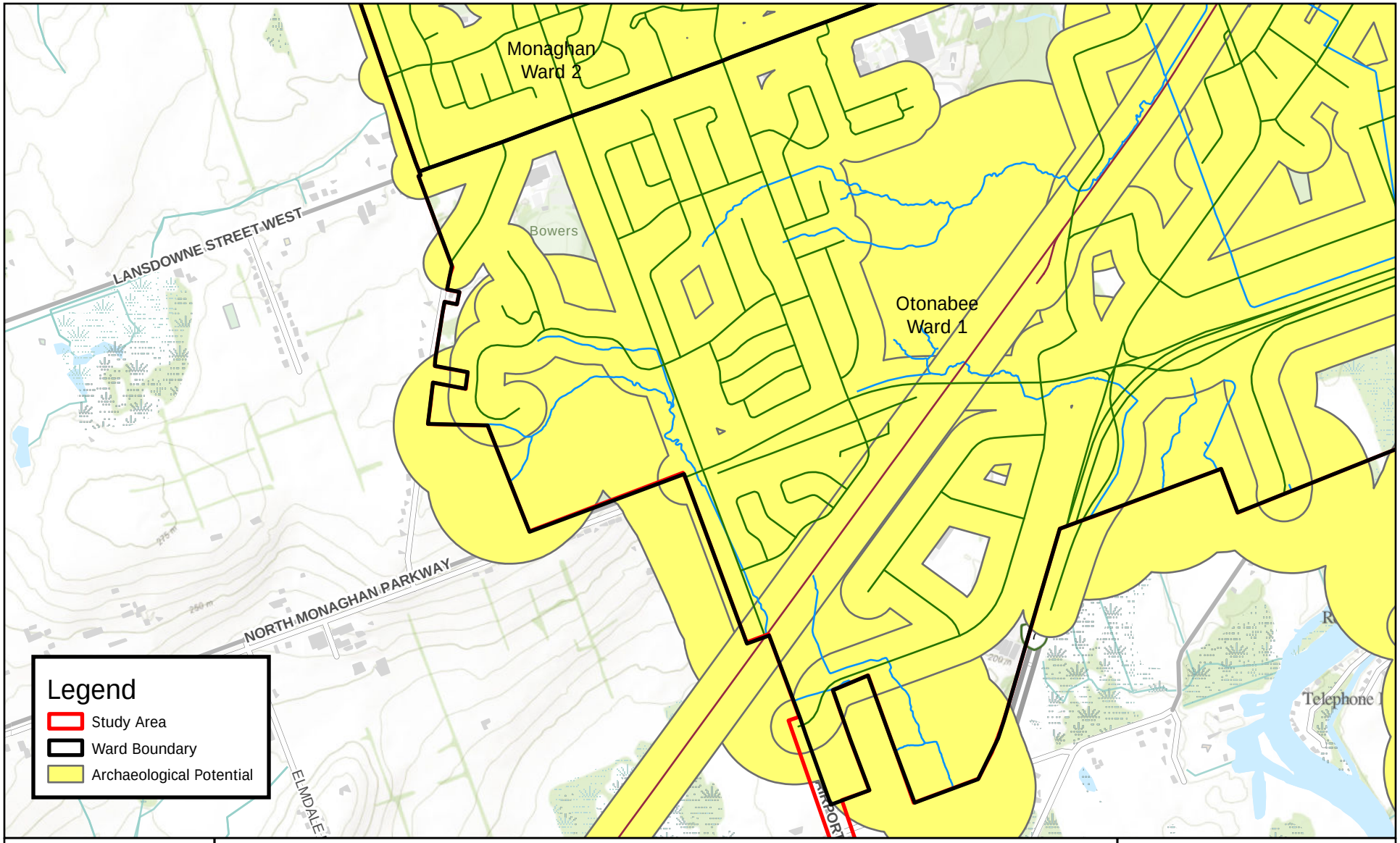

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Map 9: Otonabee Detail 2 of 2

Esri, NASA, NGA, USGS, FEMA, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

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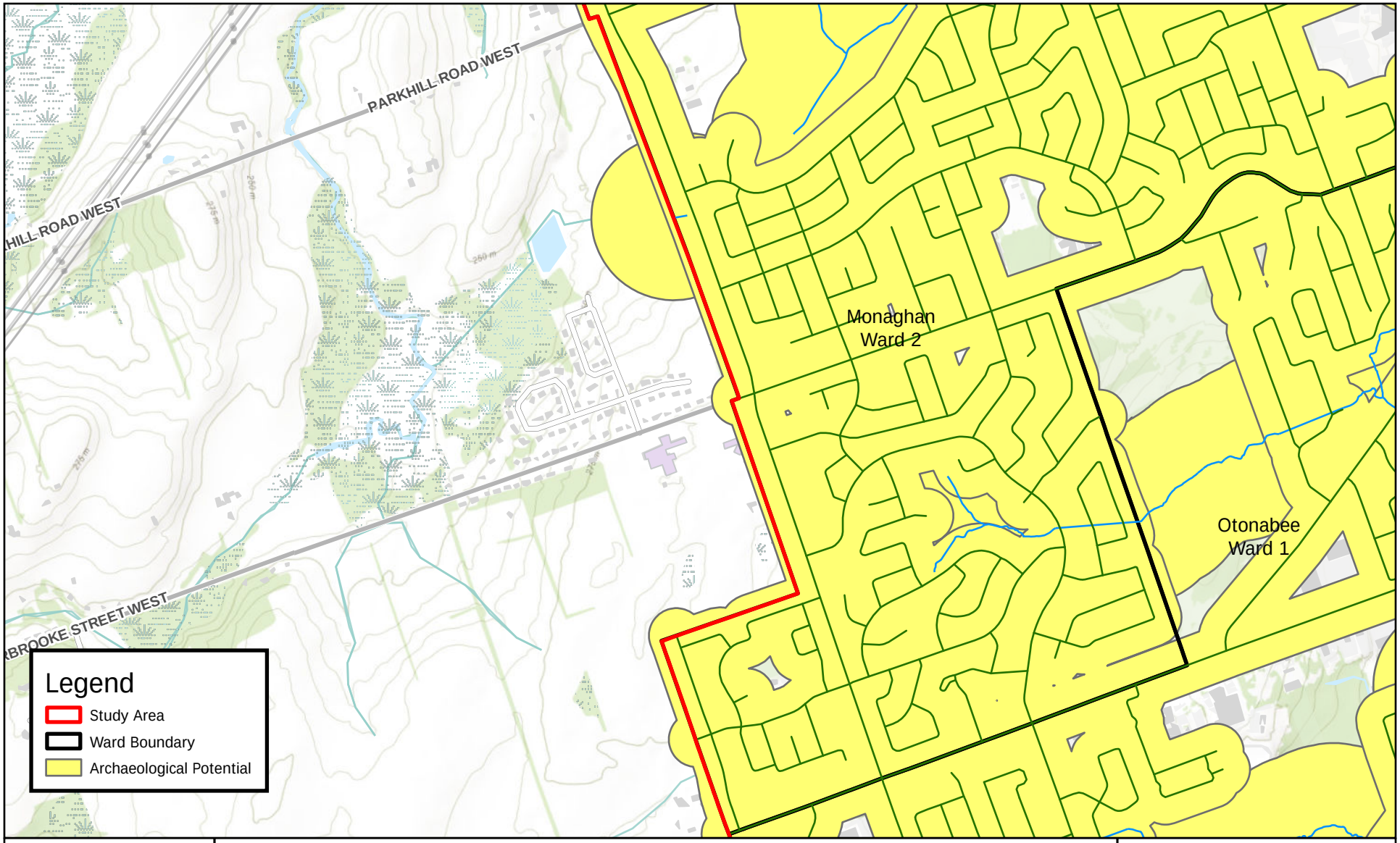

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Map 10: Monaghan Detail 1 of 2

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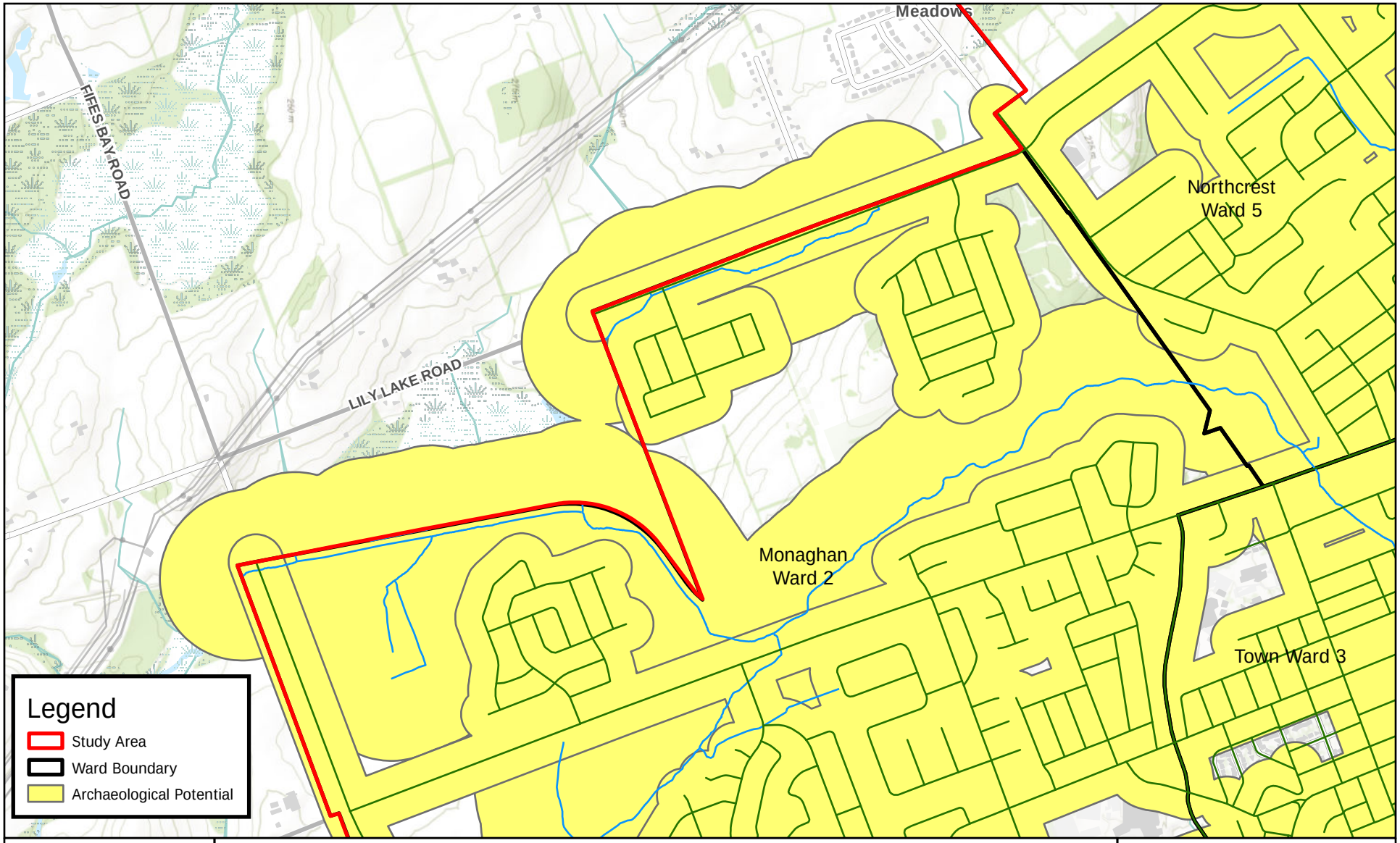

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Map 11: Monaghan Detail 2 of 2

Esri, NASA, NGA, USGS, FEMA, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

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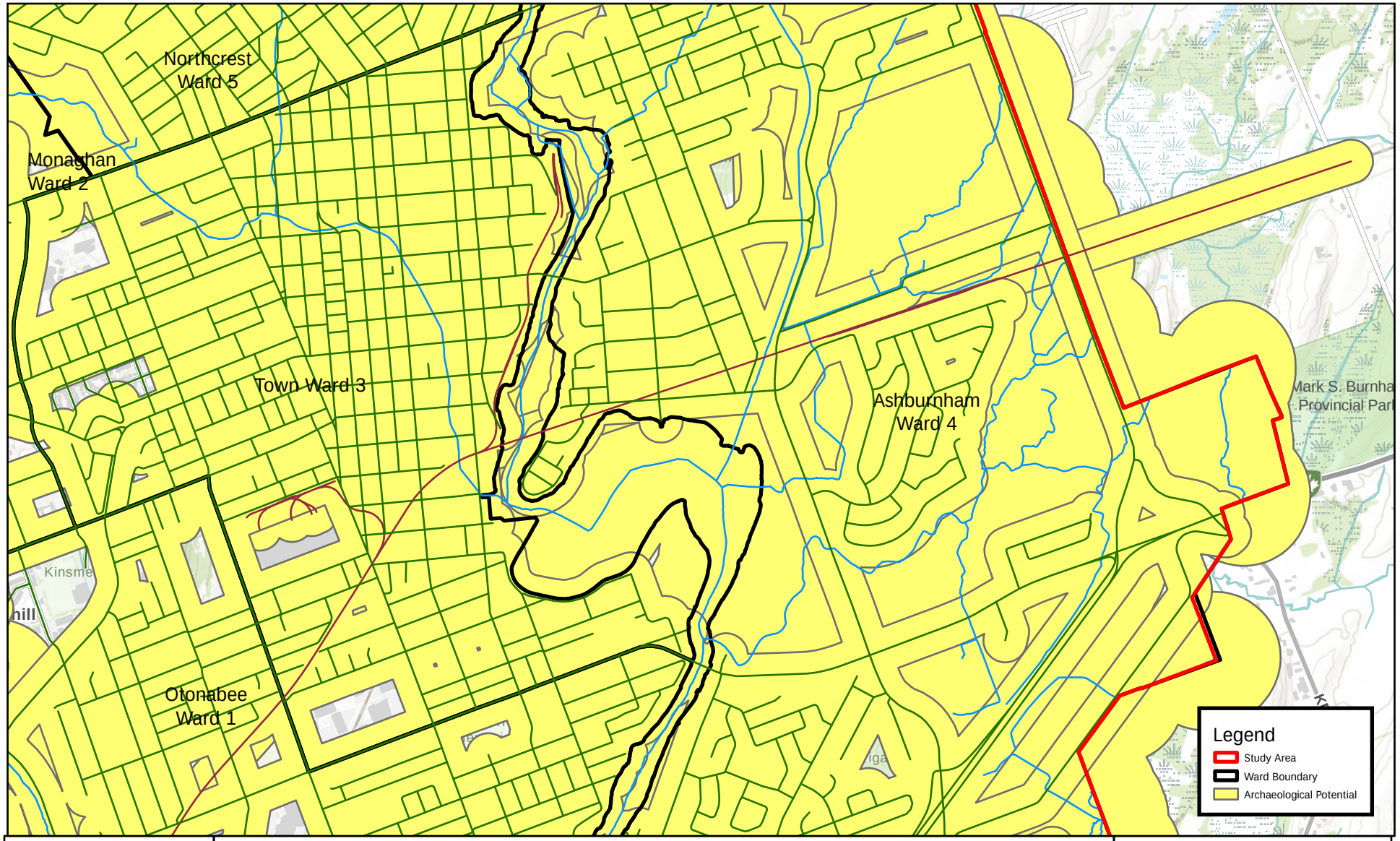

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Map 12: Town Detail

Esri, NASA, NGA, USGS, FEMA, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

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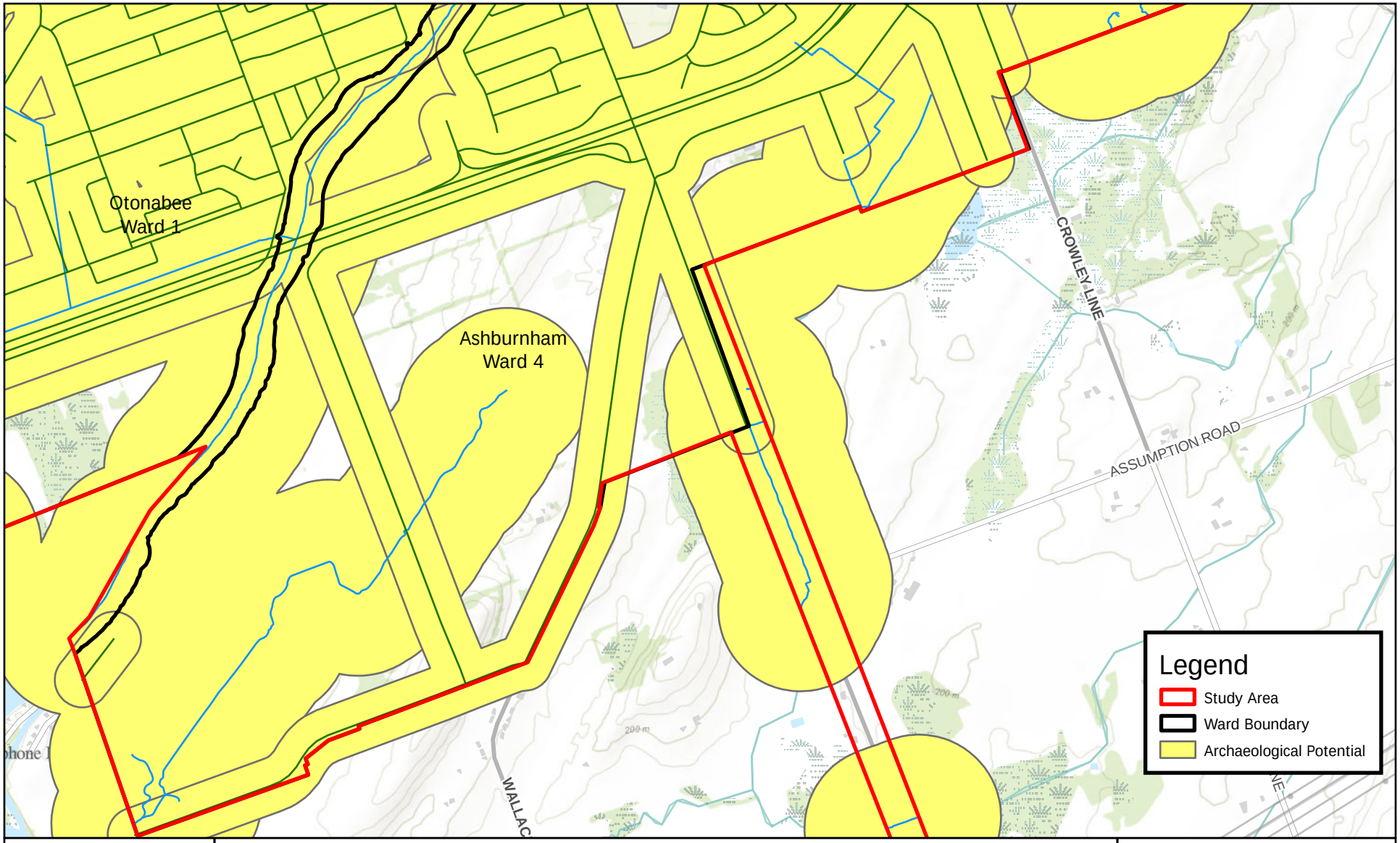

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Map 13: Ashburnham Detail 1 of 5

Esri, NASA, NGA, USGS, FEMA, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

Coordinate System: NAD 1983 UTM Zone 17N

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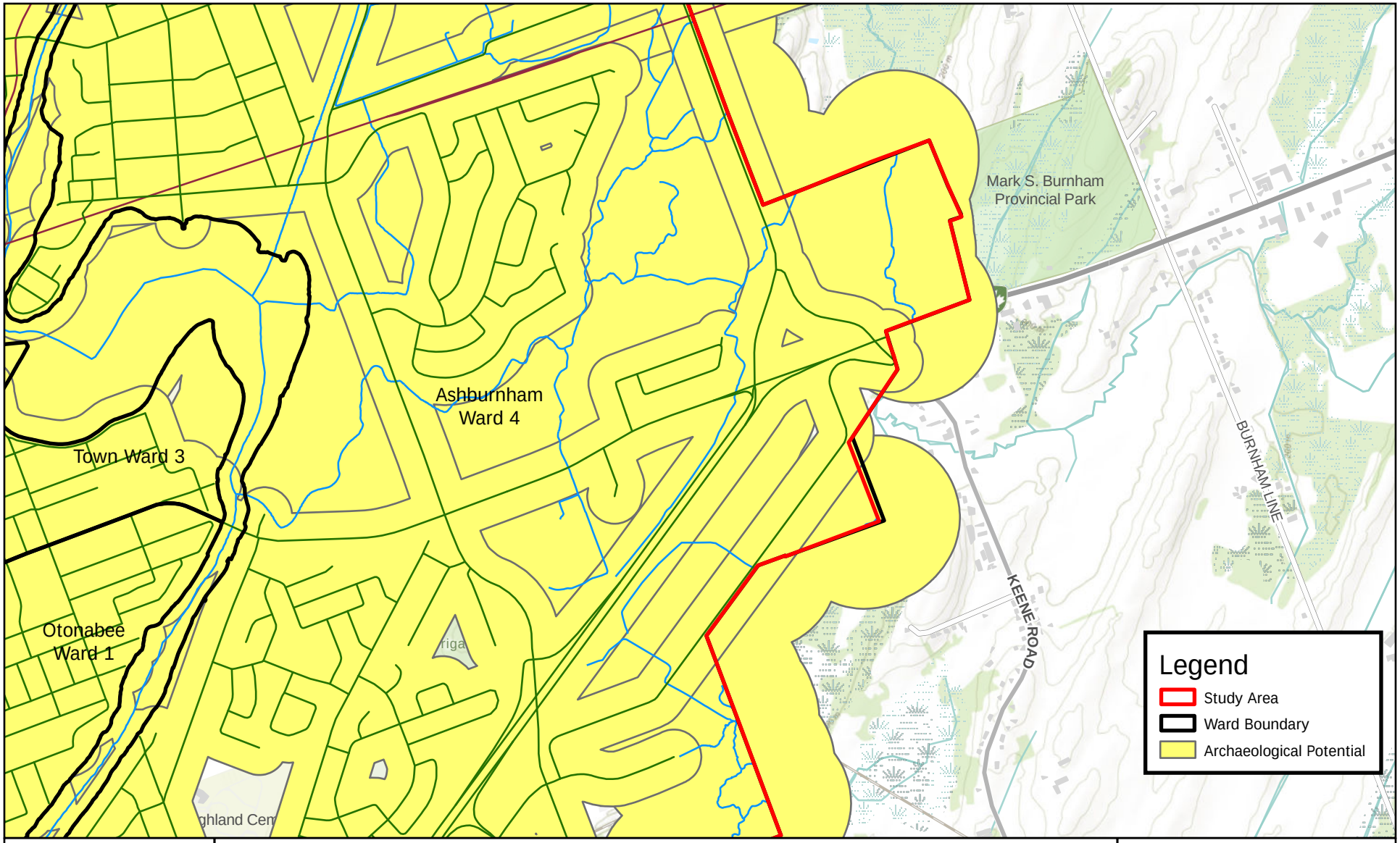

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Map 14: Ashburnham Detail 2 of 5

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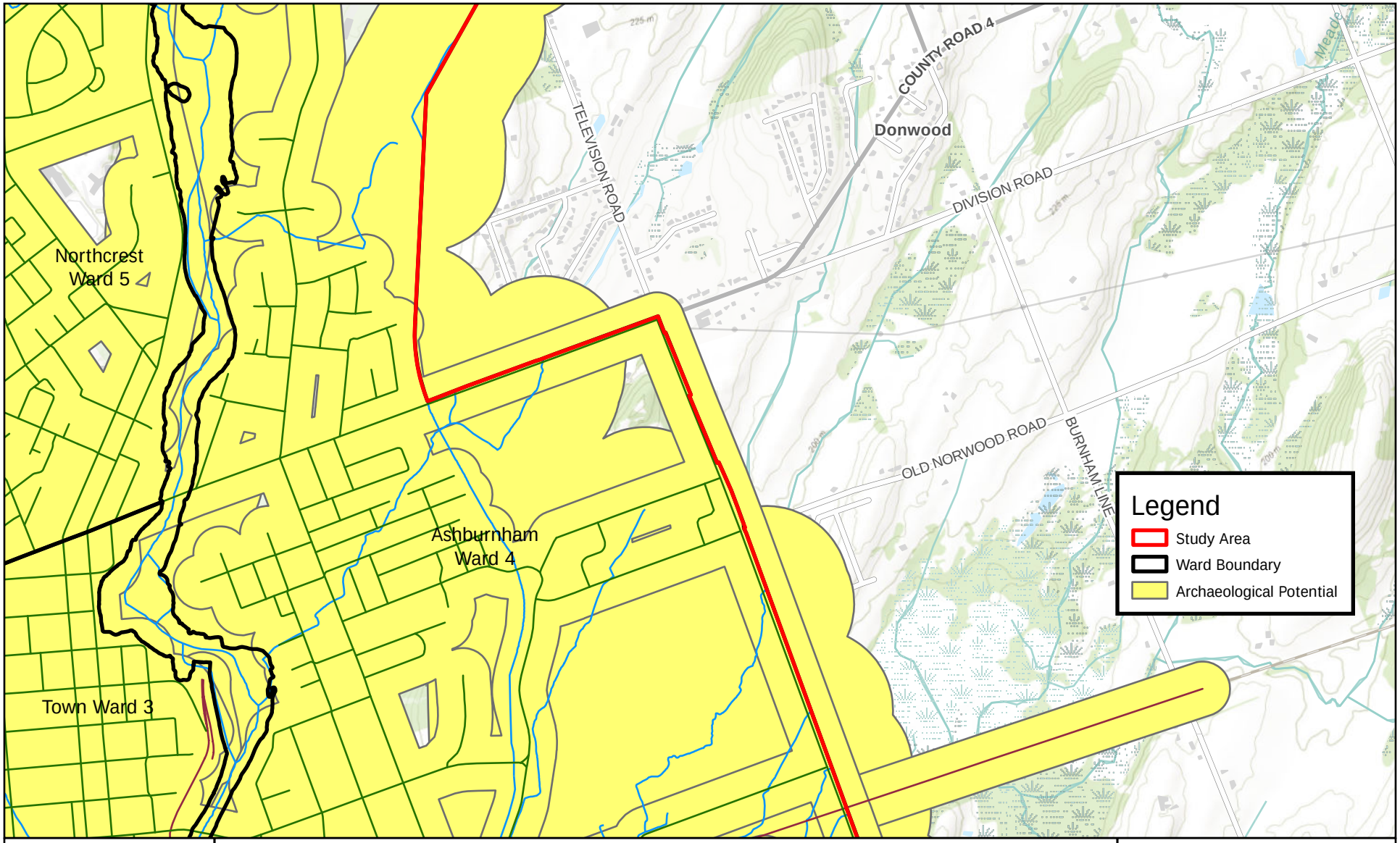

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Map 15: Ashburnham Detail 3 of 5

Esri, NASA, NGA, USGS, FEMA, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

Coordinate System: NAD 1983 UTM Zone 17N

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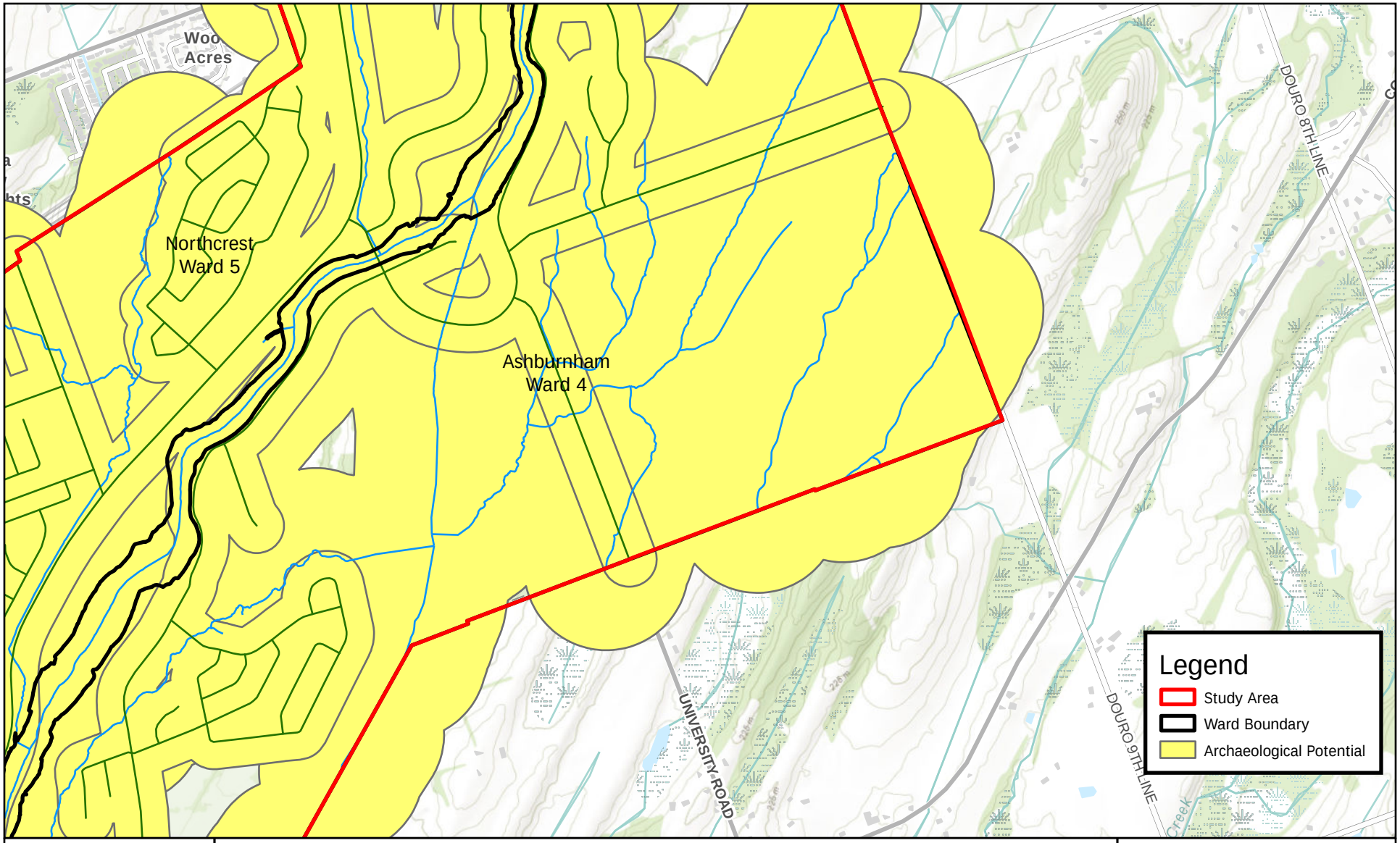

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Map 16: Ashburnham Detail 4 of 5

Esri, NASA, NGA, USGS, FEMA, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

Coordinate System: NAD 1983 UTM Zone 17N

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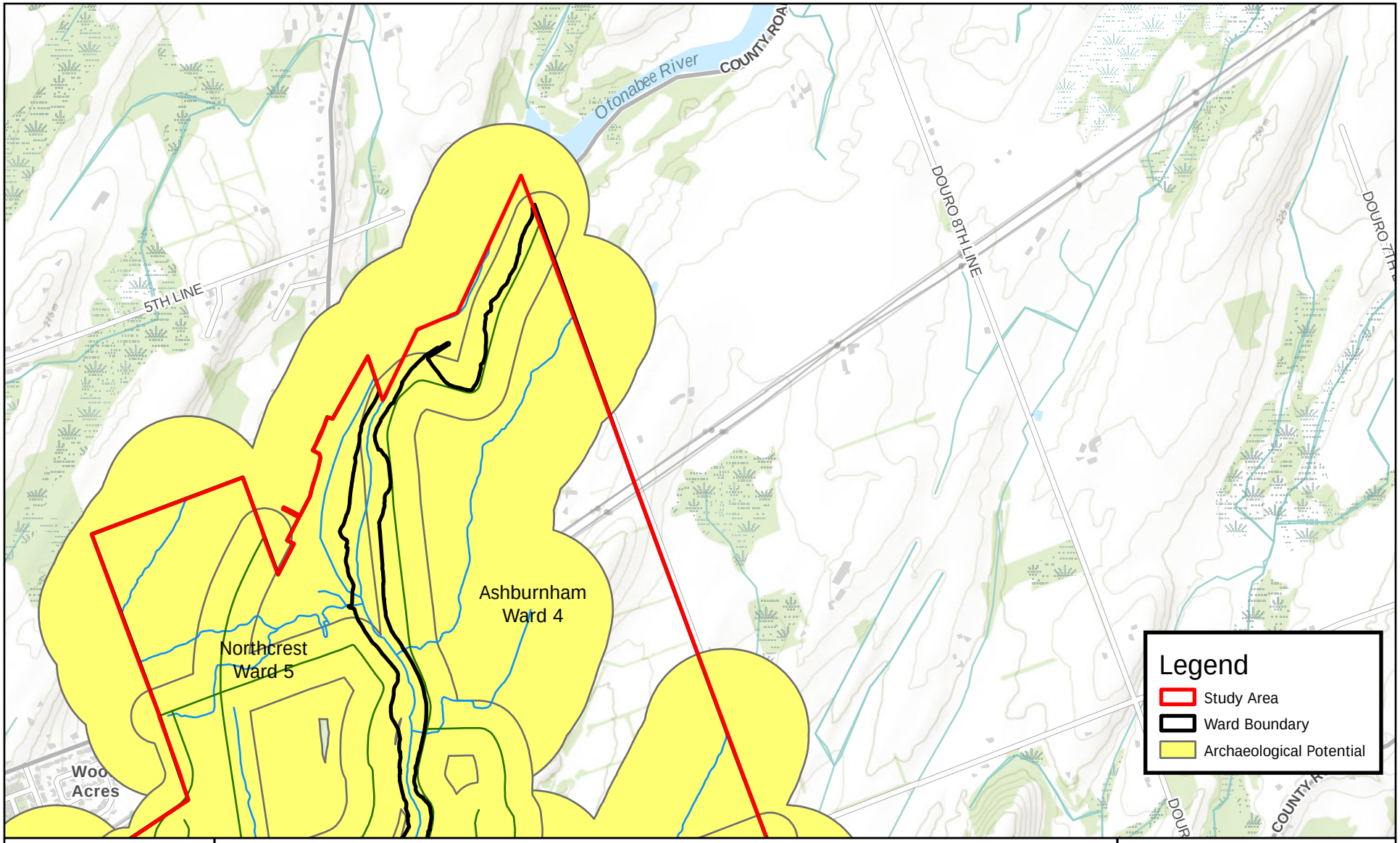

Peterborough Sanitary Masterplan Stage 1

Map 17: Ashburnham Detail 5 of 5

Esri, NASA, NGA, USGS, FEMA, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

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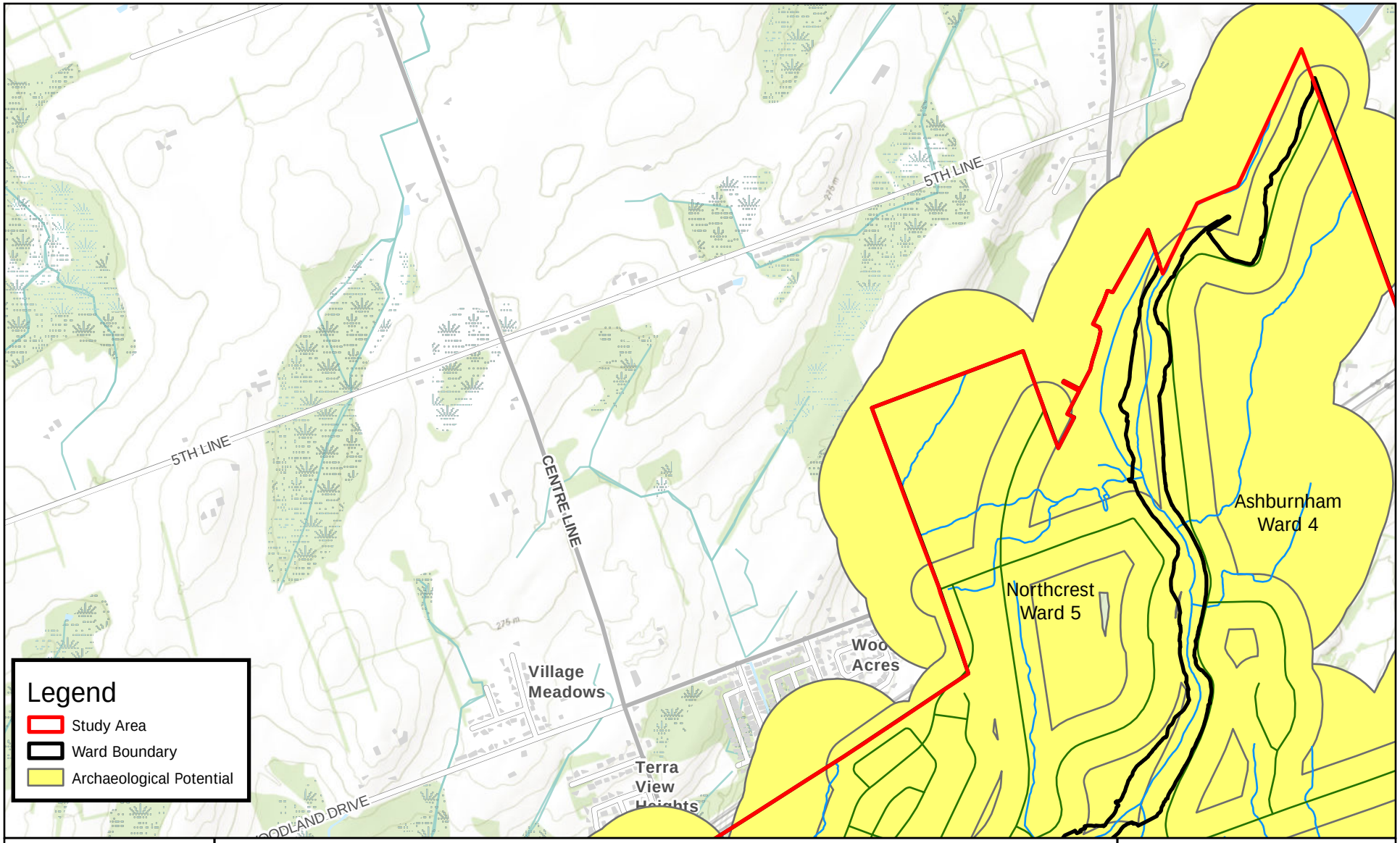

Peterborough Sanitary Masterplan Stage 1

Map 18: Northcrest Detail 1 of 3

Esri, NASA, NGA, USGS, FEMA, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

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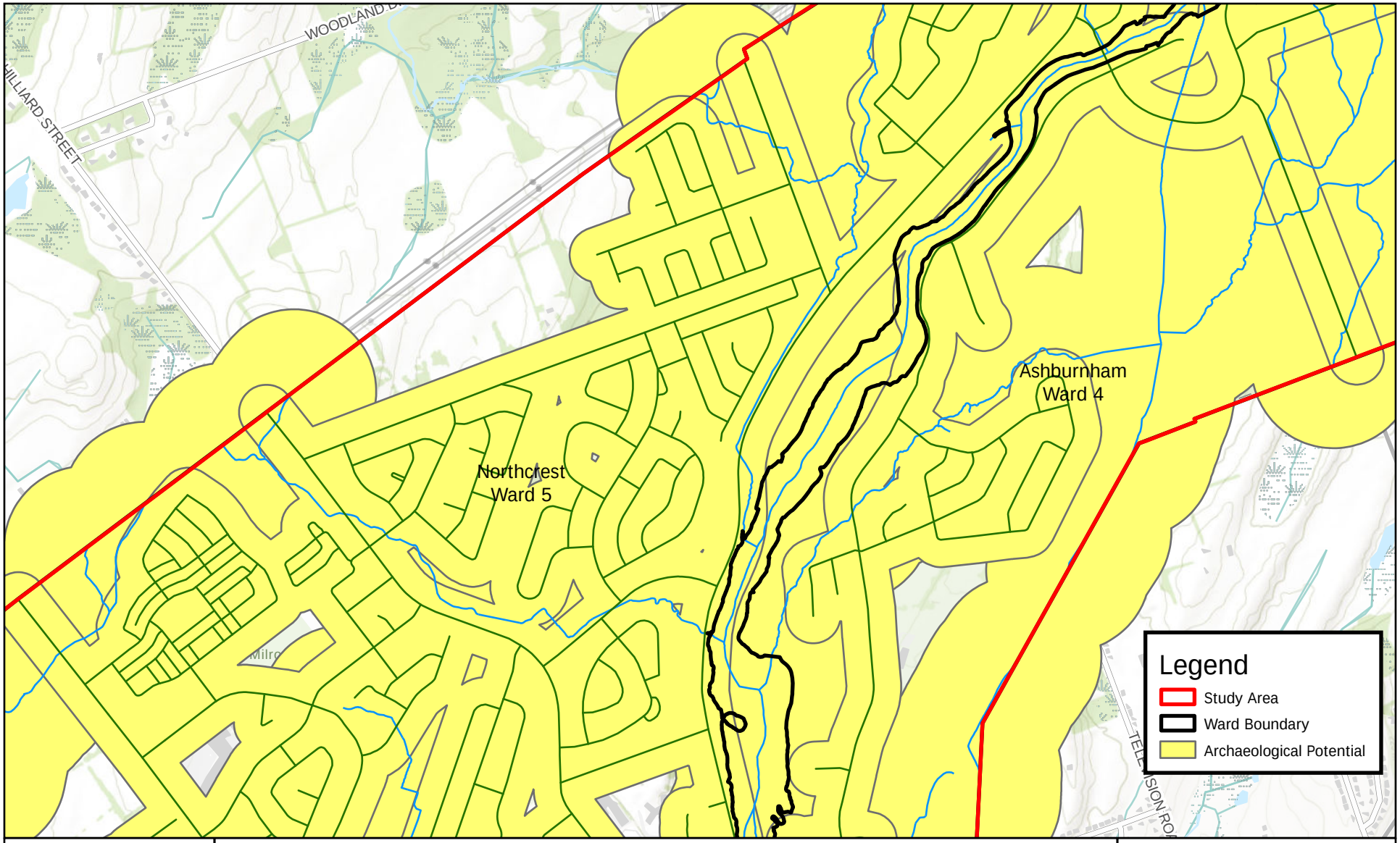

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Peterborough Sanitary Masterplan Stage 1

Map 19: Northcrest Detail 2 of 3

Esri, NASA, NGA, USGS, FEMA, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

Coordinate System: NAD 1983 UTM Zone 17N

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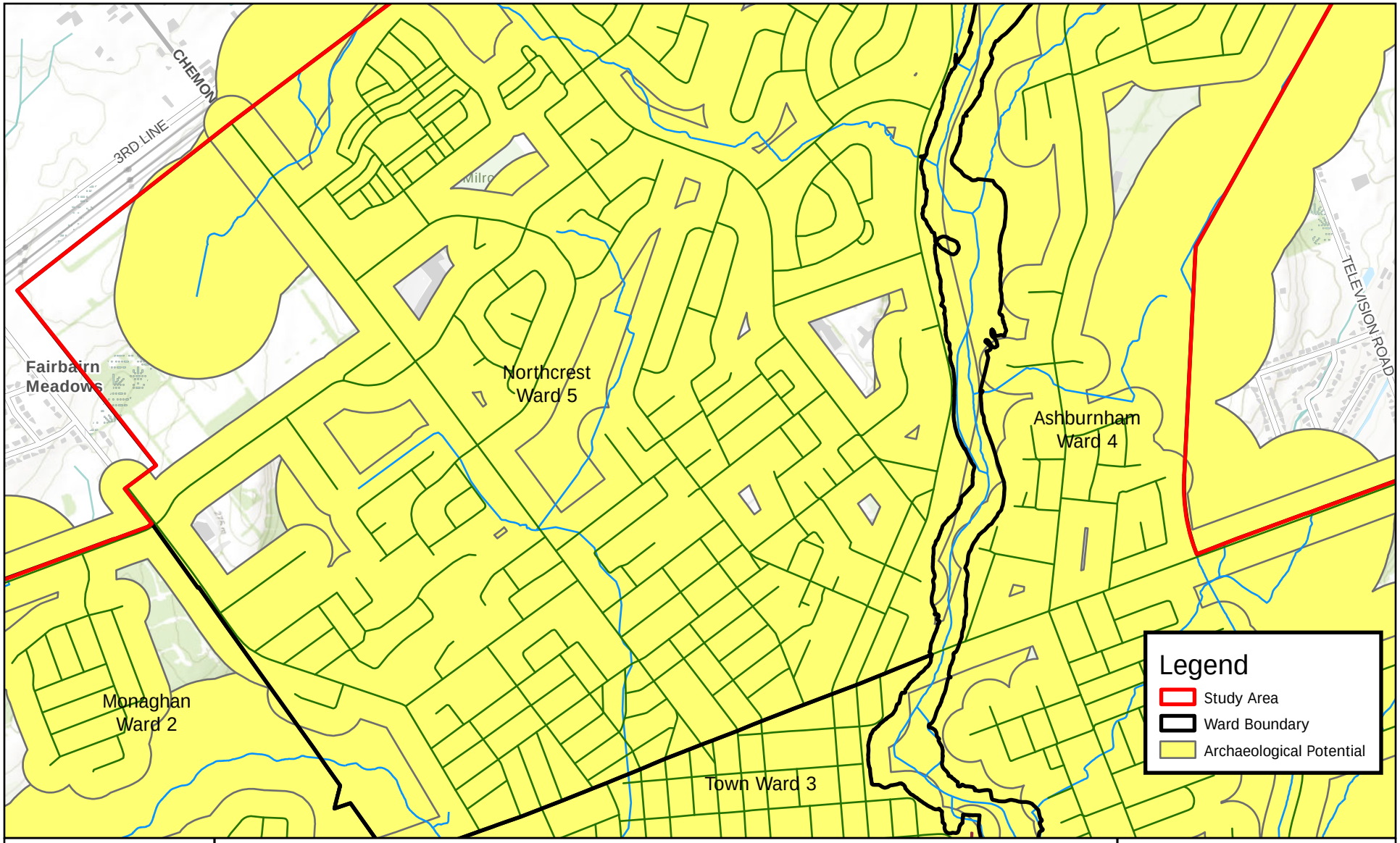
Scale 1:20,000

0 360 720 Meters

0 0.38 0.75 Km



PARSLOW HERITAGE CONSULTANCY INC.

Peterborough Sanitary Masterplan Stage 1

Map 20: Northcrest Detail 3 of 3

Esri, NASA, NGA, USGS, FEMA, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

Coordinate System: NAD 1983 UTM Zone 17N

N

Scale 1:20,000

0 360 720 Meters

0 0.38 0.75 Km

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