Colchester South Sewage Works Expansion – Schedule ‘C’ Municipal Class Environmental Assessment

Environmental Study Report

October 23rd, 2023

Prepared for:
Town of Essex

Prepared by:
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EXECUTIVE SUMMARY

GENERAL

Colchester South is a small community located in Southwestern Ontario within the municipality of the Town of Essex (The Town). The southern portion, or Urban Area, of Colchester is serviced with a communal sanitary sewer collection system. Wastewater within this service area is collected using a gravity type sewer system complete with six (6) lift stations. These sanitary sewer systems direct all wastewater into a main pumping station (PS No.1) that is located west of the Colchester Town center near Cornwall Beach Road. The wastewater is then pumped, via a 300 mm diameter forcemain, to the Colchester South Lagoons for treatment.

The Town is experiencing development pressures within the settlement area that will significantly increase sewage servicing demands in the Colchester South service area. The Town has initiated a Municipal Class Environmental Assessment (Class EA) to evaluate upgrading the existing Colchester South Sewage Works to accommodate these increased wastewater servicing demands.

The purpose of this Class EA study is to identify, evaluate, and report on the preferred design solution and corresponding design concepts for the proposed upgrades. This study will include identification and description of the problem/opportunity statement, evaluation of the alternative design solutions to accommodate increased wastewater servicing demands, and evaluation of alternative design concepts which may be applied to implement the preferred solution. This Environmental Assessment Report (ESR) is the documentation of the Class EA process outlined by the Municipal Engineers Association (MEA) for the Colchester South Sewage Works Expansion.

The recommended design solution is to upgrade the existing Colchester South Sewage Works including the Wastewater Treatment Facility and Pumping Station No.'s 1, 2, 3, 5, 6, and 7. This design solution will allow for socio-economic growth and support development within the Colchester South Community. In addition, these upgrades would incorporate improved wastewater treatment technologies that will satisfy increasingly stringent effluent quality criteria for effluent discharged into Lake Erie. The recommended design concepts for the Colchester South Sewage Works upgrades include the implementation of a Sequence Batch Reactor (SBR) treatment facility where wastewater sludge is trucked to the nearby Essex Pollution Control Plant (PCP) for dewatering and ultimate disposal. A portion of the existing Colchester South Lagoons will be repurposed to provide temporary storage during wet weather flow events.

This ESR comprises **Sections 1 to 12** inclusive and **Appendices A to E** inclusive. A brief description of each section follows.

SECTION 1: INTRODUCTION

This section provides background information regarding the Colchester South Community and a description of the Municipal Class EA process. The Class EA process is comprised of five phases which generally involve: (1) identification of problem or opportunity, (2) identification and evaluation of alternative solutions to the problem, (3) identification and evaluation of alternative design concepts, (4) documentation of the study in an ESR, and (5) implementation. This study has been carried out in accordance with Phases 1 through 4 of the Class EA process. Following this study, the municipality may choose to proceed with Phase 5, implementation.

SECTION 2: EXISTING CONDITIONS

Projects identified through this Class EA process must be evaluated based on the potential impact on the existing conditions of the study area. This section provides a general description of the existing natural environmental, social, and economic conditions in the study area as a basis for the potential impact analysis. Further, this section provides a description of the existing sanitary Sewage Works including the existing sanitary collection system, pumping stations, and wastewater treatment facility.

SECTION 3: PROBLEM STATEMENT

This section identifies the problem / opportunity statement and establishes the project objective. This section outlines the work undertaken in fulfilment of Phase 1 of the Class EA process.

SECTION 4: ALTERNATIVE DESIGN SOLUTIONS

This section involves the identification and evaluation of various alternatives solutions with the objective of determining which solution best address the problem / opportunity statement. This section outlines the work undertaken in fulfilment of Phase 2 of the Class EA process.

The following broad planning level alternative solutions have been considered and evaluated for providing improvements to the Colchester South Sewage Works:

1. Do Nothing
2. Restrict Community Growth
3. Reduce Sewage Flows and I&I (Inflow and Infiltration)
4. Modify Operations of Existing Infrastructure
5. Discharge to WWTP Outside of the Colchester South Service Area
6. Independent Onsite WWTP for New Development
7. Upgrade Colchester South Sewage Works and Expand Existing Service Area

SECTION 5: SEWAGE SERVICING ANALYSIS

This section of the report provides an overview of the anticipated population and wastewater flow for the service area in 20-years (20-year Design) and beyond the next 20-years (Ultimate Design). Further, this section presents the sewage servicing analysis and impact of the projected wastewater flow on the existing

Sewage Works (pumping stations, collection system, and wastewater treatment facility). The requirements for Sewage Works upgrades were identified based on this sewage servicing analysis and further evaluated in **Section 6** and **Section 7**. This section outlines the work undertaken in fulfilment of Phase 3 of the Class EA process.

SECTION 6: ALTERNATIVE WASTEWATER TREATMENT TECHNOLOGIES

This section of the report identifies and evaluates five (5) alternative wastewater treatment technologies leading to the selection of the preferred treatment process for this application. The evaluation process is based on minimizing undesirable social, natural environment, and economic impacts and this section of the ESR presents detailed rationale for each alternative design concept. This section outlines the work undertaken in fulfilment of Phase 3 of the Class EA process.

SECTION 7: ALTERNATIVE BIOSOLIDS MANAGEMENT STRATEGIES

This section of the report identifies and evaluates two (2) alternative biosolids management strategies leading to the selection of the preferred design concept for this application. The evaluation process is based on minimizing undesirable social, natural environment, and economic impacts and this section of the ESR presents detailed rationale for each alternative design concept. This section outlines the work undertaken in fulfilment of Phase 3 of the Class EA process.

SECTION 8: CONCEPTUAL DESIGN

This section of the report outlines the proposed sizing and staging of the Colchester South Sewage Works expansion and upgrades, preferred design approach, and proposed conceptual design.

SECTION 9: ENVIRONMENTAL IMPACTS AND MITIGATING MEASURES

This section identifies the environmental impacts of the preferred solution, describes the recommended mitigation measures and lists permits to be considered.

SECTION 10: CONSULTATION

This section includes documentation of consultation with the public, review agencies, and Indigenous communities. In order to complete Phase 4 of the Class EA process, this report will be made available for review and comment by the public, review agencies, and Indigenous communities as a part of the consultation process.

SECTION 11: OPINION OF PROBABLE COST

This section summarizes the opinion of probable cost for the recommended solution.

SECTION 12: SUMMARY

This section summarizes recommendations that are made with respect to this study.

1.0 INTRODUCTION

Colchester is located along the southern shoreline of Essex County, bordering the Township of Harrow to the north, the Town of Amherstburg to the west, the Town of Kingsville to the east, and Lake Erie to the south. With municipal restructuring that took place in Essex County on January 1, 1999, the former Towns of Essex and Harrow and the former Townships of Colchester North and Colchester South were amalgamated to form the present Town of Essex.

The Colchester South Sewage Works mainly consists of sanitary sewers, pumping stations, three (3) aerated facultative sewage lagoons, and an outfall with a multi-port diffuser to Lake Erie approximately 600 metres offshore. The three (3) cell aerated lagoon system operates in series with constant discharge all year round.

The community's sanitary service area extends from County Road 41 on the west to County Road 13 and Island View Lane on the east, from the northern town limit (Ogden Street) and County Road 50 on the north to the shoreline of Lake Erie on the south, refer to **Figure 1.2** in **Appendix A** of the service area. Wastewater is collected in a gravity sanitary sewer system, with six (6) existing lift pumping stations across the service area. The collection system directs wastewater to Pumping Station No. 1 (PS No.1) at the Colchester South Wastewater Treatment Facility which is located west of the Colchester Town center. At PS No. 1, the wastewater is pumped, via a 300 mm dia. forcemain to the lagoons for treatment. The Colchester Sewage Works are owned by the Town of Essex and currently operated by the Ontario Clean Water Agency (OCWA).

The Colchester South sanitary sewer system was initially designed and constructed in the 1970s and 1980s. The sewer system was designed to service existing residents and accommodate future development within the boundaries of the Colchester South service area. The existing sanitary sewer system has since been extended with some modifications to sewershed areas over the years as developments proceeded.

1.1 BACKGROUND

In July 2022, Stantec completed the Colchester Sanitary Sewer System Capacity Study to assess the capacity of the existing sanitary collection system using a hydraulic model. The study identified that no capacity upgrades were required at that time and capacity upgrades would be required in the future as the service area becomes more developed. A proposed expansion to the service area (Colchester Bay Development), which includes high density residential units triggered this Class EA to upgrade the existing sewage works capacity. In addition to the Colchester Bay Development, there are a number of other developments proposed within the service area that are slated for completion within the next 20 years, that were identified during this Class EA.

These developments are anticipated to generate a significant increase in wastewater servicing demands beyond the capacity of the existing Colchester South Sewage Works. Therefore, the Town initiated this Class EA to address these demands and determine a long-term solution to upgrade the capacity of the Colchester South Sewage Works and accommodate development within the existing service area.

1.2 PURPOSE OF REPORT

This is an Environmental Study Report (ESR) for the Colchester South Sewage Works Expansion that provides a summary of the rationale, planning, design, and consultation process for this project. The ESR presents the completed planning and decision-making process for the recommended design solution and design concepts for the Colchester South Sewage Works Expansion. The ESR will satisfy the Class EA process for 'Schedule C' projects which will include identification and description of the problem or opportunity, identification and evaluation of alternative solutions, and identification and evaluation of design concepts leading to the recommended design for the Colchester South Sewage Works. The decision-making process is based upon minimizing undesirable impacts on the natural, social, and economic environments and the ESR presents the rationale for decisions made. Where impacts on the environment are unavoidable, proposed mitigating measures are presented for consideration to minimize those impacts.

1.3 CLASS ENVIRONMENTAL ASSESSMENT PROCESS

The Ontario *Environmental Assessment Act* (the Act) aims to protect, conserve, and properly manage the natural, social, cultural, built, and economic environments as undertakings are planned and implemented in Ontario.

The Act provides a means for the public or interested groups to receive the needed assurances that the environment is being protected from adverse effects on any significant public project. If there are necessary adverse effects on the environment, the public also needs assurances that all essential measures are being taken to minimize these impacts. The proponent is to weigh the impacts of several possible alternative ways to achieve the desired objective and to select the best alternative based on a thorough examination of each.

The Act recognized that certain municipal undertakings occur frequently, are small in scale, have a generally predictable range of effects or have relatively minor environmental significance. To ensure that a degree of standardization in the planning process is followed throughout the Province, the Act provides for the preparation of class EAs for approval by the Ministry of Environment, Conservation, and Parks. A Class EA is an approved planning document that specifies the processes for which the proponent agrees to follow. The work undertaken in preparation of this study report follows the planning and design process of the Municipal Engineers Association (MEA) Class EA, October 2000, as amended in 2007, 2011, 2015, and 2023.

This report also serves as a statement for public use in the decision-making process under the Act. Municipal staff and consultants can use the Class EA process in planning, design, and construction of projects to ensure that the requirements of the Act are met. Granted the approved Class EA procedure is abided by, the implementation of projects within the class EA do not require further approval under the Act. There are three approval mechanisms available to the proponent under the Class EA:

- **Eligible for Screening to Exempt** (Previously known as **Schedule A** or **Schedule A+**) projects are limited in scale, have minimal adverse environmental affects, and include several normal or

emergency municipal maintenance and operational objectives. Projects listed in these schedules are now exempt from the Act.

- **Schedule B** projects generally include improvements and minor expansions to existing facilities. In these cases, there is a potential for some adverse environmental impacts and therefore the proponent is required to proceed through a screening process including consultation with those who may be affected.
- **Schedule C** projects generally include the construction of new facilities and major expansions to existing facilities. These projects proceed through the environmental assessment planning process outlined in the Class EA and require preparation of an Environmental Study Report (ESR) to document the planning process.

The preferred solution has multiple activities identified under multiple Class EA schedules. Therefore, this project is being completed under the Municipal Class EA as a **Schedule C** activity, which is the highest identified schedule. Upon completion of Phase 1 through 4 for Schedule C projects, the Owner may proceed directly to Phase 5 and implement the preferred solution.

1.3.1 Phases in Municipal Class EA Process

Figure 1.1 in **Appendix A** illustrates the steps followed in the planning and design of projects covered by the Municipal Class EA. The Class EA for municipal projects follows a five-phase planning process that can be summarized as follows:

Phase 1 – Identification of the problem

Phase 2 – Identification of alternative solutions to the problem, consultation with review agencies and the public, selection of the preferred solution, and identification of the project as Exempt, Eligible for Screening to Exempt, or a Schedule B or C activity.

Phase 3 – Identification of alternative design concepts (technical alternatives) for the preferred solution, evaluation of the alternative designs and their impacts on the environment, consultation with review agencies and the public and selection of the preferred design.

Phase 4 – Preparation of an Environmental Study Report (ESR) to document the planning, design, and consultation process for the project. The ESR is placed on the public registry for scrutiny by review agencies and the public.

Phase 5 – Final design, construction, and commissioning of the selected technical alternative. Monitoring of construction for adherence to environmental provisions and commitments.

1.4 PROJECT SCHEDULE

Phase 1 through 4 of the Municipal Class EA process were completed as a part of this study. Phase 5 of the Municipal Class EA process, project implementation, is anticipated to commence in Fall of 2023. **Table 1.1** outlines the project schedule thus far and the anticipated schedule for implementation.

Table 1.1: Project Schedule for the Colchester South Sewage Works Expansion

Phase of Class EA Process	Project Component	Timeline
Phase 1	Notice of Commencement and Identification of the Problem / Opportunity Statement	August 2022
Phase 2	Evaluation of Alternative Solutions	September 2022 – December 2022
	Public Information Centre No. 1	October 2022
Phase 3	Evaluation of Alternative Design Concepts	January 2023 – April 2023
	Public Information Centre No. 2	March 2023
Phase 4	Draft Environmental Study Report	April 2023
	Council Presentation	June 2023
	Notice of Completion	July 2023
Phase 5	Project Implementation	As required

2.0 EXISTING CONDITIONS

The following sections provide an overview of background information and a description of existing conditions within the broad study area as a basis for comparison. Alternative design solutions and concepts must be evaluated based on their potential impact to existing natural environment, social, and economic factors.

2.1 GENERAL DESCRIPTION OF THE SERVICE AREA

The Town of Essex, with a population of 21,216 (2021 Canadian Census) is located in Essex County in southwestern Ontario. The Town of Essex is bounded by the Towns of Lakeshore and Tecumseh (north), the Town of Amherstburg (west) and the Town of Kingsville (east). The amalgamated Town of Essex is made up of four urban communities, Essex Centre, Harrow, Colchester, and McGregor. Colchester is one of the oldest communities in the region. A number of important historic events occurred within Essex County and the Colchester community including the Proclamation of 1792, the War of 1812, and the Underground Railroad.

The waterfront community of Colchester is situated at the south boundary of the Town of Essex on the north shore of Lake Erie. In addition to the year-round residents, Colchester is made up of lakeside cottages, wineries, restaurants, a marina, public beach, and harbour. The Canadian Census Program shows the population of Colchester as of 2021 was approximately 2,334 people, this is about a 5% increase from the 2016 population.

The existing Colchester South service area is shown in **Figure 1.2** of **Appendix A**. The Colchester South sanitary service area extends from County Road 41 on the west to County Road 13 and Island View Lane on the east, from the northern town limit (Ogden Street) and County Road 50 on the north to the shoreline of Lake Erie on the south. The Colchester South Sewage Works are owned by the Town of Essex and operated by the Ontario Clean Water Agency (OCWA).

2.2 LAND USE

The Colchester South service area is mostly composed of residential dwellings and agricultural lands with some parkland and commercial establishments in the urban centre. Although some portions are currently agricultural lands the entirety of the service area is zoned for development (with the exception of a small parcel of Wetland District). As per the Town of Essex's Official Plan, the service area is zoned as majority Residential District with smaller portions zoned as Commercial District, Green District, and Wetland District. All the developed lands within this area are serviced with separate sanitary sewers and storm sewers.

2.2.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) is a consolidated statement of the government's policies on land use planning. The PPS was issued in 2020 under the *Planning Act* and as such all decisions affecting planning matters shall be consistent with the Provincial Policy Statement. The PPS has policies across five

themes: increasing housing supply and mix, protecting the environment and public safety, reducing barriers and costs, supporting rural, northern, and Indigenous communities, and supporting certainty and economic growth. The PPS is a key consideration for identifying land-use planning objectives and evaluating alternative design concepts in **Section 8.0** of this ESR.

In combination with Municipal Official Plans, the PPS outlines a framework for comprehensive planning that allows Ontario to sustain strong communities, a clean and healthy environment, and economic growth. The key approach for implementing the PPS is through Municipal Official Plans which identify provincial interests and present appropriate land use designations and policies for the local community. It is important that Municipal Official Plans are kept up to date with the PPS to protect provincial interests and ensure that development takes place in suitable areas. This proposed project is consistent with the Town of Essex's Official Plan.

2.3 NATURAL ENVIRONMENT

2.3.1 Climate

The climate in Essex County is classified as modified humid continental, which has hot and humid summers with mild winters and adequate precipitation. In comparison with the other areas in the Province, Essex County's southerly latitude and proximity to the lower Great Lakes provides for warmer summer and winter temperatures with a longer growing season. Because the area is also on one of the major continental storm tracks, it experiences wide variations in day-to-day weather including severe summer thunderstorms. The normal minimum and maximum temperatures are –9 ^{0}C and +28 ^{0}C respectively and the mean daily temperature is above 6 ^{0}C, which tends to increase temperatures in surface waters.

2.3.2 Geology and Physiography

Most of the bedrock under the region is sedimentary limestone of the Devonian age which has a high calcium and magnesium content. The bedrock in the majority of Essex County is covered by glacial drift with a thickness ranging from 3 m to 45 m from west to east. The parent soil material is a heavy ground moraine and lacustrine deposition containing a considerable amount of limestone, appreciable amounts of shale and some igneous rock.

Overall, the topography in the Colchester urban area is flat with scattered sandy and gravelly knolls and poor soil conditions. The service area may be considered as two distinct sections: the eastern and the western sections with the boundary lying between lots 76 and 77 (near Marsden Beach Road). The elevation ranges from roughly 172 m to 192 m, with the northeast end around being the highest point.

2.3.3 Soils and Subsurface Conditions

Soils within the region were formed from glacio-till, glacio-fluvial outwashes and lacustrine deposits left by the glacial lakes which once covered the area. Most of the area is part of a smooth clay plain and the predominant soil types are Perth and Brookston clays and their associated clay loams with some localized

sand and gravel areas. Developed from dolomitic limestone intermixed with shale, the imperfectly drained member is the Perth clays, and the poorly drained member is the Brookston clays.

The soil in the eastern section consists of mainly fine sand having a wide density range and the groundwater table approximately 3.1 m (10 ft) below the ground surface. The soil in the western section consists of mainly clay till with an upper weathered zone of brown clay, a desiccated zone of brown clay at a depth of 2.1 to 4.6 m (7 to 15 ft), and a plastic zone of gray clay at a depth of 4.0 to 6.1 m (13 to 20 ft). The long-term groundwater table in the western section is expected to be close to the interface between the brown and grey clay. To avoid installation below the groundwater table as much as possible, sewers have been designed with a minimum depth of 1.8 m (6 ft) to provide private service connections at the property line at 1.35 m (4' 6") below ground level. The system's shallow sewer depths require buildings with drainage fixtures below the sanitary service invert to use sewage ejector pumps to lift raw sewage into the Town's sewer system.

2.3.4 Natural Vegetation

The County lies completely within the Niagara section of the Deciduous Forest Region of Ontario. Favourable soil and climatic conditions have allowed for the extension of many species of Carolinian and Prairie flora which makes the region unique in Canada. The remnant broadleaf forests in Essex County are therefore a resource of national importance.

Several broad-leaved trees exist sporadically on specialized sites. Some examples include, sassafras, tulip-tree, papaw, red mulberry, Kentucky coffee tree, redbud, black gum, blue ash, mockernut hickory, pignut hickory, black oak, pin oak, chestnut oak, pepperidge and sweet chestnut. In addition to the variety of trees, there are southern herbs and prairie vegetation found in specific areas. Many years ago, some of the area was cleared for agricultural land uses and therefore there are few remaining areas of trees or woodlots. Extensive areas of formally marshy low land have been drained through extensive farm drainage ditches over the last several decades. These farm drains drain the soil but also carry significant levels of sediments and agricultural pollutants to the lake and natural streams. Soil drainage restricts the type of natural vegetation which can naturally grow where land is not farmed.

Potential impacts associated with construction activities generally include soil compaction, siltation, and spills of deleterious substances, noise disturbance, and encounters with wildlife. These impacts are considered short term, localized to the construction area during construction activities, and will be mitigated through the application of appropriate construction techniques and mitigation measures.

2.3.5 Terrestrial Life

The natural wetland areas as well as the extensive agricultural land consists of generally small animals such as deer, rabbits, squirrels, raccoons, skunks, birds, fox, muskrat, beaver, etc. These animals are typically well adapted to human activity; therefore, no permanent impact to breeding birds, reptiles and other wildlife is expected as a result of the installation of the proposed solution.

2.3.6 Marine Life

Lake Erie is the shallowest and therefore the warmest of all the Great Lakes. Lake Erie has historically provided an abundant supply of specific types of fish including perch, smallmouth bass and walleye which are warm water fish. Some trout and salmon stocking of creeks was commenced in the 1970's and this has resulted in some of these fish reproducing within the Great Lakes. They are however more susceptible to pollution and warm water conditions which occur in slow moving water which is devoid of sufficient oxygen.

2.4 CULTURAL HERITAGE ENVIRONMENT

This section describes the cultural heritage component of the environment which includes archaeological resources, built heritage resources and cultural heritage landscapes.

2.4.1 Archaeological Resources

A Stage 1 archaeological assessment (AA) (under Project Information Form number (PIF) P422-0030-2023) was undertaken on May 16, 2023, by Stantec Inc. for the study area. A Stage 1 AA consists of a review of geographic, land use and historical information for the property and the relevant surrounding area, and contacting MCM to find out whether, or not, there are any known archaeological sites on or near the property. Its purpose is to identify areas of archaeological potential and further archaeological assessment (e.g., Stage 2-4) as necessary. The Stage 1 AA report is included in **Appendix E**.

The Stage 1 archaeological assessment of the study area for the Project determined that much of the study area, approximately 98.82%, retains archaeological potential. In accordance with Section 1.3.1 and Section 7.7.4 of the MCM's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011), Stage 2 archaeological assessment is required for any portion of the Project's anticipated construction activities which impact an area of archaeological potential.

The remaining portions of the study area, approximately 1.18%, retain low to no archaeological potential due to low and permanently wet areas. In accordance with Section 1.3.2, Section 2.1 Standard 2, and Section 7.74 of the MCM's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011), Stage 2 archaeological assessment is not required for any portion of the Project's anticipated construction activities which impact an area of low to no archaeological potential.

One historical cemetery is documented partially within the study area, and for which the background research, historical documentation, and mapping is insufficient to completely confirm that no burial activity occurred beyond the legal boundaries. The final design and construction footprint for the Project will be determined at a later date. If any invasive ground disturbances are proposed as part of the Project within a minimum of 10 metres of the cemetery's currently understood property boundaries, as allowed by the study area, a Cemetery Investigation Authorization from the BAO will be required.

Any further recommended assessment (e.g. Stage 2-4) will be completed as early as possible in the detailed design phase and prior to any ground disturbing activities.

2.4.2 Built Heritage Resources and Cultural Heritage Landscapes

The MCM's *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* checklist was completed for the Study Area. The Checklist determined that the Hutchins Family Cemetery is situated adjacent to the Study Area and within 50 metres of the proposed sewage works expansion. The cemetery is designated by the Town of Essex through BYLAW No. 1059 under Part IV of the Ontario Heritage Act. As such, a Heritage Overview Memorandum was prepared on June 1, 2023 by Stantec's Heritage Team to oversee that any potential impacts to the adjacent cemetery are mitigated. The Heritage Overview was prepared alongside the archaeological assessments to coordinate any applicable mitigation recommendations. The checklist and the Heritage Overview Memorandum are included in **Appendix E**.

Based on consultation with the appropriate regulatory bodies and completion of the MCM Checklist, one municipal heritage property, the Hutchins Cemetery, designated by the Town under Part IV of the OHA, was identified within the Cultural Heritage Study Area. As a cemetery, recommendations in this Heritage Overview have been coordinated with the Stage 1 Archaeological Assessment that was completed by Stantec for the EA (Stantec 2023).

The final design and the construction footprint for the WWTF should be designed in a manner that avoids potential impacts to the Hutchins Cemetery. This should be done through establishment of a 50-metre buffer surrounding the currently identified boundaries of the cemetery. Detailed designs for the WWTF should be provided to a Cultural Heritage Specialist and Archaeologist for review at 30%, 60%, 90%, and 100% stages to provide feedback, if any, on the potential interactions with the cemetery and advise on the mitigation measures identified above. The location of the cemetery should be mapped on construction maps and temporary fencing should be installed. Staging and laydown areas should be selected to be noninvasive and avoid the cemetery's currently understood property boundaries.

Should the preferred option described above not be feasible and Project work is required within 50 metres of the Hutchins Cemetery, the alternative mitigation option should be applied. This includes preparation of a property specific HIA prior to completion of detailed design. The HIA should confirm the heritage attributes and boundaries identified within the designating by-law in order to review the potential for impacts to the cemetery as a result of the Project. The HIA should consider the compatibility of the Project with identified heritage attributes of the cemetery and include recommendations and mitigation measures where impacts are identified. The HIA shall be submitted to the MCM, municipality, and other interested parties for review and comment.

2.5 DESCRIPTION OF EXISTING SANITARY COLLECTION SYSTEM AND PUMPING STATIONS

2.5.1 Collection System

The Urban Area of Colchester, which consists of six (6) sewersheds, is serviced with a municipal sanitary sewer collection system. Each sewershed is serviced by its own dedicated sewage pumping station. Wastewater within each sewershed is collected using gravity sanitary sewer systems complete with its

dedicated lift pumping station, which lift the flow from its own sewershed as well as the flow from the upstream sewershed(s).

Pumping Station No.1 is the main pumping station located west of the Colchester Town centre, and south of the existing wastewater treatment lagoons. Pumping Stations No.'s 2 and 3 pump raw sewage from the western portion of Colchester, while stations No.'s 4 (future construction), 5, 6, and 7 pump raw sewage from the eastern portion of Colchester to Pumping Station No.1 (main pumping station). The main pumping station pumps all the raw sewage to the lagoons for treatment. The location of the six (6) pumping stations is shown in **Figure 2.1**.

2.5.2 Design Sewage Flow Rate and Population Density

The sewage flow design basis for the sanitary sewer system is summarized in **Table 2.1**. In the 1980's when the pumping stations were being designed a theoretical '20-year' design basis was used to size the pumping capacity. However, no modifications have been made to the pumping stations since their construction. The sewers were sized under the ultimate design basis.

The average sewage flow of 454 L/c/d is typical of current MECP Design Guidelines and Town of Essex Development Standards. At the time of the original system's design, the typical industry standard for peak extraneous flow used was 0.14 L/s/ha. The soil in Colchester west of the treatment facility is mainly clay type while the soil east of the treatment facility is mainly fine sand type. Due to the variation in soil type and increased infiltration in the eastern section a higher peak extraneous flow was selected for the ultimate design period. A peak extraneous flow of 0.28 L/s/ha was used for the portion of the service area east of the treatment facility. A peak extraneous flow of 0.21 L/s/ha is the current standard specified in the Town of Essex Development Manual.

Table 2.1: Design Basis – Sewage Flow

Design Parameter	Pumping Station Design Basis	Sewer Design Basis
Sewage Flow: Average Domestic Flow	364 L/c/d (80 lgpcd)	454 L/c/d (100 lgpcd)
Peaking Factor	Harmon	Harmon
Peak Extraneous Flow	227 L/c/d	0.14 L/s/ha (1) (0.002 cfs/ac) OR 0.28 L/s/ha (2) (0.004 cfs/ac)

Notes:
(1) Peak I/I Ultimate= 0.14 L/s/ha used to design the sanitary sewer system west of the treatment facility (made up of mostly clay soil).
(2) Peak I/I Ultimate= 0.28 L/s/ha used to design the sanitary sewer system east of the treatment facility (made up of mostly sandy soil).

Table 2.2 presents a summary of the population densities used for the design of the sewage collection system.

Table 2.2: Design Basis – Population Density

Land Use	Population Density	Average Unit Sewage Flow
Residential	35 ppha (1) OR 3.25 ppd (2)	16 m^3/ha/d
Mobile Park Homes	2.20 ppd	1 m^3/d
Industrial	Varies	Varies
Commercial	Varies	Varies

Notes:
(1) A population density of 35 persons per hectare was used for undeveloped lots within the service area.
(2) A population density of 3.25 persons per dwelling was used for developed lots within the service area.

2.5.3 Design Sewage Flows

Table 2.3 summarizes the design parameters for the pumping station and sewer design. Pumping Station No. 1 was designed to service an average sewage flow of 21 L/s, and total peak flow of 94 L/s (8.1 MLD) which corresponds to 5,090 equivalent persons. The sewer system under ultimate conditions was intended to service an average sewage flow of 70 L/s, and total peak flow of 335 L/s (29 MLD) which corresponds to 13,322 equivalent persons.

Table 2.3: Design Flows (Cumulative)

Sewershed	Pumping Station Design Basis				Sewer Design Basis			
	Area (ha)	Equiv. Pop. (persons)	Q_{AVG} (L/s)	Q_P (L/s)	Area (ha)	Equiv. Pop. (persons)	Q_{AVG} (L/s)	Q_P (L/s)
1 (WWTP)	-	5090	21	94 (8.1 MLD)	419	13322	70	335 (29 MLD)
2	-	1875	7.9	35	134	4556	24	103
3	-	325	1.4	6.5	46	1460	7.7	35

Sewershed	Pumping Station Design Basis				Sewer Design Basis			
	Area (ha)	Equiv. Pop. (persons)	Q_{AVG} (L/s)	Q_P (L/s)	Area (ha)	Equiv. Pop. (persons)	Q_{AVG} (L/s)	Q_P (L/s)
4 (1)	-	450	1.9	8.8	13	450	2.4	13
5	-	2340	9.9	42	121	3616	19	100
6	-	2660	11	49	140	4031	21	114
7	-	2860	12	53	183	5303	28	151

Notes:
Q_{AVG} = Average Diurnal Sewage Flow
Q_P = Total Peak Flow = Average Sewage Flow x Peaking Factor (Harmon) + Peak I/I
(1) The Pumping Station No. 4 has not been constructed and the corresponding sewershed is not serviced by the existing collection system.

2.5.4 Pumping Stations

Pumping Station No. 1 consists of a 3,660 mm diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 94.2 L/s at a TDH of 15.06 m. Additionally, the station is equipped with an ultrasonic level sensor, automatic dual-pump control, and float switch alarm installations. The sanitary system connects to pumping station No. 1 via a 750 mm ID inlet sewer located on the private Right-of-Way south of the sewage treatment facility. The sewage is pumped from PS No. 1 to the valve chamber via two (2) – 250 mm ID discharge pipes and further to the lagoon inlet distribution chamber via a 300 mm ID forcemain.

The remaining pumping stations are 3,660 mm diameter precast concrete wet well type stations each equipped with two (2) submersible constant speed pumps operating as lift stations.

A summary of the existing pumping station capacities is provided in **Table 2.4.**

Table 2.4: Existing Pumping Station Capacities and Details

PS No.	Discharge Type	No. of Pumps	Configuration	TDH (m)	Raw Sewage Capacity	
					Firm (L/s)	Total (L/s)
1	Pump (forcemain)	2	Duty-Standby	15.06	94.2	188.4
2	Lift (sewer)	2	Duty-Standby	9.88	34.5	69
3	Lift (sewer)	2	Duty-Standby	6.0	6.5	13
4	Future					
5	Lift (sewer)	2	Duty-Standby	6.13	42.4	84.8
6	Lift (sewer)	2	Duty-Standby	7.92	48.7	97.4
7	Lift (sewer)	2	Duty-Standby	6.49	52.7	105.4

2.6 DESCRIPTION OF EXISTING WASTEWATER TREATMENT FACILITY

2.6.1 Wastewater Treatment Facility

The Colchester South Wastewater Treatment Facility is located on a 12.16-hectare parcel of land in Farm Lot 82, Concession 1 along Cornwall Beach Road. This land is situated approximately 500 m south of County Road 50, and directly north of a corridor of land occupied by waterfront residents. The sanitary sewer system was initially constructed in the late 1980s to service existing development but designed to allow for future development within the boundaries of the urban centre of Colchester. The Colchester South Wastewater Treatment Facility consists of:

- Pumping station No. 1;
- An aerated facultative lagoon, with three (3) sequentially operated cells having effective capacities of 23,385 cubic metres (primary cell), 13,974 m^3 (secondary cell) and 6,254 m^3 (tertiary cell), total depth of 5.0 m (i.e., 1.0 m freeboard, 0.3 m ice cover allowance, 3.4 m effective depth, 0.3 m sludge storage), width of all berms at the top of 3.0 m, outer and inner berm slopes of 3:1 (all inner slopes protected against erosion by a layer of crushed limestone placed over filter fabric), blanket drain (polyethylene mesh structure with geotextile on both sides) placed under the top layer of clay lining the cells throughout the bottoms and inner slopes of the cells, including blanket drain collector pipes discharging into the inlet sewer ahead of pumping station No. 1;
- Lagoon aeration system consisting of propeller aspirator type aerators mounted on two-pontoon floating assemblies anchored with a cable system to the anchor posts on the cell berms, with four (4) 7½ HP aerators fitted with "7½ HP" propellers in the primary cell, two (2) 7½ HP aerators fitted with "5 HP" propellers in the secondary cell and one (1) 7½ HP aerator fitted with "5 HP" propeller in the tertiary cell;
- Inflow distribution and flow control system, including inlet distribution chamber, two (2) flow control chambers, outfall chamber, cell inflow and outflow pipes, and collection and by-pass sewers;
- Control building housing phosphorus removal facility, stand-by diesel generator, laboratory, and storage;

- Phosphorus removal facility, located in the control building, consisting of a 22.7 m^3 capacity chemical storage tank, two (2) diaphragm type metering pumps (one installed, one spare) rated at 5 to 50 mL/s, and a chemical feed line to pumping station No. 1 with two alternate points of chemical feed in the wet well and in the valve chamber (pressure feed into the forcemain); and

- Outfall sewer from the lagoon system's outfall chamber to Lake Erie is approximately 600 m offshore, including the valve chamber located within the treatment facility's property and a multi-port diffuser.

- Alum is dosed at two locations in the wastewater treatment facility. The first dosing location is immediately after pumping station No. 1, where alum is dosed into the forcemain as it is leaving the wet well. The second dosing location is in flow control chamber No. 2, prior to entering Cell 3.

- The alum dosage is controlled at the Control Building of the Township of Colchester's South Direct Grant Sewage Works. The alum dosage is determined based on the runtime of the raw sewage pumps in pumping station No. 1 (RSP1 and RSP2).

- Major unit process data are summarized in **Table 2.5**.

Table 2.5: Colchester South Wastewater Treatment Facility – Unit Processes

Unit Process	Process Description
Pumping Station No.1	
Number and Type of Pumps	Two submersible sewage pumps, each 94.2 L/s @ 15.06 m TDH
Hp each	25
Firm capacity	8140 m^3/d
Total capacity	16,280 m^3/d
Lagoon System	
No. of Cells	3
Effective Capacities	23,385 m^3 (primary), 13,974 m^3 (secondary), 6254 m^3 (tertiary)
Total Depth	5 m
Operating Configuration	Series: Cell 1 → 2 → 3
Hydraulic Retention Time	12.8 (primary), 7.7 (secondary), 3.4 (tertiary); 23.9 days total
Aerators per Cell	4 @ 7.5 Hp, 7.5 Hp Propeller (primary); 2 @ 7.5 Hp, 5 Hp Propeller (secondary); 1 @ 7.5 Hp, 5 Hp Propeller (tertiary)
Type of Aerators	Surface aspirator
Phosphorous Removal	
Chemical	Alum
Storage	22.7 m^3 storage tank

Unit Process	Process Description
Chemical Feed Pumps	Two (1 duty, 1 standby), each 18-180 L/hr diaphragm with variable speed drive
Outfall Sewer	
Size and Material	560 mm dia. polyethylene
Arrangement	From lagoon system's outfall chamber to Lake Erie, 600 m offshore
Type	Gravity flow
Standby Power	
No. of Units and Capacity:	One, 90 kW stand-by diesel generator

2.6.2 Design Sewage Flows

The facility provides treatment of wastewater from the existing Colchester South service area. The wastewater treatment facility was constructed in the 1980s, to service an equivalent population of 4,000 persons, with a rated capacity of 1,816 m^3/d. The original design basis and ultimate design expectation is outlined in **Table 2.6**.

Table 2.6: Design Basis – Sewage Flows

Parameter	Original Design Basis	Ultimate Design Expectation
Equiv. Population	4,000	13,322
Average Sewage Flow (m^3/d)	1,816	6,048
Harmon Peak Factor	3.34	2.83
Peak Sewage Flow (m^3/d)	8,122	28,944

2.6.3 Design Wastewater Characteristics

The raw wastewater influent to the Colchester lagoon is primarily of domestic origin, except for a few commercial sources. **Table 2.7** presents a summary of the assumed wastewater characteristics used for the original system design.

Table 2.7: Design Basis – Wastewater Characteristics

Description	Lagoon Influent Concentration (mg/L)	Lagoon Effluent Concentration (mg/L)
BOD_5	170	25
Total Suspended Solids (TSS)	200	30
Total Phosphorous (TP)		1

2.6.4 Historical Wastewater Characteristics and Loading

Table 2.8 presents a summary of the historical raw wastewater characteristics and loadings for the existing treatment system between 2015-2021. The average historical wastewater characteristics are lower than the original design basis which may be a contributing factor to the good performance of the Wastewater Treatment Facility. The maximum month concentrations appear to be higher than what would typically be expected for this application. This could be caused by a multitude of factors such as the presence of outlier data or infrequent sampling protocols. The design loads should be further reviewed and finalized during the detailed design phase (Phase 5 – Implementation).

Table 2.8: Colchester Lagoon Raw Wastewater Characteristics

Parameter	Concentration (1) (mg/L)		Loading (3) (kg/d)	
	Average	Max Month (2)	Average	Max Month (2)
BOD_5	106	220	109	227
TSS	130	544	134	561
TP	2.5	7.5	3	8

Notes:
(1) Average concentration based on 2015-2021 historical average.
(2) Maximum month concentration based on maximum month factors (2015-2021)
(3) Loading based on annual average daily flow (2015-2021) of 1,032 m^3/d

2.6.5 Aerated Facultative Sewage Lagoon

The existing lagoon system is comprised of three sequentially operated cells; primary, secondary, and tertiary. The total depth of the cells is 5 m, (i.e., 1.0 m freeboard, 0.3 m ice cover allowance, 3.4 m effective depth, and 0.3 m sludge storage). The lagoon system's total hydraulic retention time is about 23.9 days.

The lagoon's aeration system consists of propeller aspirator type aerators mounted on two-pontoon floating assemblies anchored with a cable system to the anchor posts on the cell berms. There is a total of seven (7) aerators across the three (3) cells; four (4) in the primary, two (2) in the secondary, and one (1) in the tertiary. Further design criteria for the aerated facultative sewage lagoon are provided in **Table 2.9**.

Table 2.9: Aerated Facultative Sewage Lagoon Design Criteria

Parameter	Existing Design
Operating Configuration	Series: Cell 1 → 2 → 3
Type	Facultative
Aeration	Cell 1: 4 at 7.5 Hp, 7.5 Hp Propeller ea.
	Cell 2: 2 at 7.5 Hp, 5 Hp Propeller ea.

Parameter	Existing Design
	Cell 3: 1 at 7.5 Hp, 5 Hp Propeller
Organic Loading Rate (operating in series)	170 mg BOD_5/L
Surface Area	Cell 1: 0.93 ha Cell 2: 0.58 ha Cell 3: 0.30 ha TOTAL 1.81 ha
Effective Volume (between d_{MIN}=0.3 m and d_{MAX}=3.7 m)	Cell 1: 23,385 m^3 Cell 2: 13,974 m^3 Cell 3: 6,254 m^3 TOTAL 43,613 m^3
Hydraulic Retention Time (HRT) (between d_{MIN}=0.3 m and d_{MAX}=3.7 m)	Cell 1: 12.8 days Cell 2: 7.7 days Cell 3: 3.4 days TOTAL 23.9 days
Operating Depth	Sludge Allowance: 0 m to 0.3 m Effective Zone: 0.3 m to 3.7 m Ice Allowance: 3.7 m to 4 m

2.6.6 Phosphorus Removal

The Colchester South Wastewater Treatment Facility uses alum dosing for the removal of phosphorus. The phosphorus removal facility is located inside the control building just south of the lagoon, which also houses the stand-by diesel generator, laboratory, and storage. The alum dosage is controlled at the control building. The alum dosage is determined based on the runtime of the raw sewage pumps in pumping station No. 1.

The phosphorus removal process consists of a 22.7 m^3 capacity chemical storage tank, two (2) diaphragm type metering pumps (one installed, one spare) rated at 5 to 50 mL/s, and a chemical feed line to PS No.1. The alum is dosed at two locations in the sewage works, the first location is pumping station No. 1 directly into the wet well. The second dosing location is in the valve chamber, after PS No. 1, directly to the forcemain. **Table 2.10** summarizes the phosphorus removal process design criteria.

Table 2.10: Phosphorus Removal Design Criteria

Parameter	Existing Design
Liquid Alum Chemical Storage Tank	
No.	1
Capacity	22,700 L

Parameter	Existing Design
Chemical feed pumps	
No.	2
Configuration	Duty – Standby
Capacity	18 – 180 L/hr, diaphragm, with variable speed drive

2.6.7 Outfall

The outfall sewer extends from the lagoon system's outfall chamber to Lake Erie approximately 600 m offshore. The outfall sewer includes a valve chamber located within the sewage work's property and a multi-port diffuser in the end section of the outfall to assist in dispersing the effluent.

The details of the outfall, as per the 1988 design drawings, are presented in **Table 2.11**.

Table 2.11: Existing Outfall Details

Parameter	Land Portion	Lake Portion
Diameter	500 mm	560 mm
Length	123 m	600 m
Pipe Material	Cement lined ductile iron	Polyethylene
Depth	2.40 m below grade	1.01 m below lake bottom
Diffuser	-	7 – 0.1 m diameter ports 3 operational, 4 closed with blind flanges 0.75 m above lakebed

2.6.8 Biosolids Management

Due to the use of lagoons, the biosolids management practices at the existing Colchester South Wastewater Treatment Facility are minimal. In facultative lagoons solid particles which reside in the influent wastewater are allowed to settle to the bottom and accumulate within the lagoons. At this point these settled solids are referred to as sludge and/or biosolids. Typically, sludge is removed from the lagoon systems every 20 to 30 years (or as needed) to maintain hydraulic retention time, treatment performance, and reduce odour. At the Colchester South Wastewater Treatment Facility, Lagoon Cell No. 3 was partially dredged and cleaned between 2018 and 2019. The removed sludge was trucked to and disposed of at a landfill. Lagoon Cell No.'s 1 and 2 have not been cleaned since the implementation of the facility.

2.6.9 Treatment and Compliance Requirements

The treatment plant operates under Environmental Compliance Approval (ECA) No. 9096-7SFHHG issued May 28, 2009. A copy of the current ECA is contained in **Appendix B.** The current ECA outlines the existing effluent compliance limits and objectives for the facility, which are summarized in **Table 2.12.**

Table 2.12: Existing Effluent Objectives and Compliance Limits

Parameter	Effluent Limits	Effluent Objectives
	Monthly Average Concentration	Concentration
cBOD5	25 mg/L	20 mg/L
TSS	30 mg/L	25 mg/L
TP	1.0 mg/L	0.8 mg/L

2.7 HISTORICAL OPERATING CONDITIONS

2.7.1 Raw Influent Sewage Flows

Historical annual wastewater flows to the Colchester South Lagoon from 2015 to 2021 are summarized in **Table 2.13.** The annual precipitation and annual average daily wastewater flows were relatively constant over the period 2015 to 2021, ranging from 705 mm to 1076 mm and 896 m^3/d to 1159 m^3/d, respectively.

Table 2.13: Historical Raw Influent Sewage Flows (2015-2021)

Year	Daily Average Flow (m^3/d)	Daily Max Flow (m^3/d)	Peak Factor	Annual Precipitation (mm)
2015	951	3560	3.74	705
2016	896	2719	2.86	744
2017	1090	4017	4.22	946
2018	1100	3873	4.07	1031
2019	1159	3848	4.05	1,000
2020	1044	3468	3.65	870
2021	982	4093	4.30	1076

Average Day flow (based on the 2021 data reviewed) is approximately 982 m^3/d, representing approximately 54 percent of the rated plant capacity (1,816 m^3/d). The most recent three-year annual average day flow (based on 2019 to 2021 data) is 1,062 m^3/d, representing approximately 58 percent of the rated plant capacity.

The Colchester South collection system is a separate sanitary sewer system that was designed to carry domestic wastewater to the sewage works. However, extraneous flows into the sanitary system result in flow increases during storm events. Peak flows vary due to the contribution of wet weather inflow and infiltration into the community's aging sanitary sewers. Based on the 2021 average day flow of 982 m^3/day and maximum day flow of approximately 4,093 m^3/d, the maximum day flow factor is 4.30, suggesting a high level of extraneous flow (infiltration and/or inflow, I/I) entering the collection system.

2.7.2 Influent and Effluent Characteristics

The historical influent/effluent wastewater characteristics for the review period are summarized in **Table 2.14**. Influent concentrations are generally consistent with typical medium-strength domestic wastewater characteristics as indicated in MECP Design Guidelines (170 mg/L BOD total, 200 mg/L SS, and 7 mg/L TP) and Metcalf & Eddy (190 mg/L BOD, 210 mg/L SS, and 7 mg/L TP).

Table 2.14: Average of Influent and Effluent Characteristics (2015-2021)

Parameter	Influent (mg/L)	Final Effluent (mg/L)	Removal Rate (%)
$cBOD_5$	106	5.9	94.4
TSS	130	14.9	88.5
TP	2.5	0.08	96.8

As shown in **Table 2.15**, lower monthly flows generally coincide with higher influent concentrations (except TSS in 2019) in comparison to influent concentrations in maximum flow months.

Table 2.15: Summary of Influent Characteristics (Min and Max Flow Months)

Influent Parameter (1)	Year					
	2021		2020		2019	
	Max Flow Month	Min Flow Month	Max Flow Month	Min Flow Month	Max Flow Month	Min Flow Month
Monthly Mean Flow (m^3/d)	1,477	732	1,479	673	1,913	727
$cBOD_5$ (mg/L)	130	172	105	135	27	42
TSS (mg/L)	129	152	152	157	47	36
TP (mg/L)	2.42	3.84	2.14	3.48	0.55	1.82
Notes: (1) Influent flow and concentrations based on values reported in monthly (plant) data sheets						

The Colchester South Lagoon has consistently produced a quality effluent. As shown in **Table 2.16,** over the 2021 period reviewed, the plant achieves its effluent compliance requirements with concentrations of 5.82 mg/L, 13.20 mg/L, and 0.09 mg/L for $CBOD_5$, TSS, and TP, respectively. The plant has continued to achieve a high-quality effluent and has consistently met its effluent compliance requirements.

Table 2.16: Summary of Colchester South Lagoon Effluent Quality

Parameter		ECA limits	2015	2016	2017	2018	2019	2020	2021
cBOD5 (mg/L)		25.0	5.84	5.72	6.61	5.58	5.89	5.49	5.82
TSS (mg/L)		30.0	14.16	17.32	16.88	15.38	13.46	13.83	13.20
Total Ammonia Nitrogen (mg/L)	Spring-Fall (1)	-	3.42	6.01	8.58	6.79	5.08	2.02	1.09
	Winter (2)	-	18.54	15.04	12.74	13.703	14.88	11.99	17.66
Total Phosphorous (mg/L)		1.0	0.08	0.06	0.09	0.08	0.08	0.06	0.09
E. coli (cfu/100mL)		-	70.46	42.64	100.04	193.20	234.28	154.65	357.83

Notes:
(1) Spring-Fall period: May 1 - Nov 3
(2) Winter period: Dec 1 - April 30

3.0 PROBLEM STATEMENT

The Colchester South sanitary sewer system was initially designed and constructed in the 1970s and 1980s. The sewer system was designed to service existing residents and accommodate future development within the boundaries of the Colchester South service area. Historical sewage flows to the treatment facility from the Colchester South wastewater service area are given in **Table 2.13** of **Section 2.7**. An annual average sewage flow of 982 m^3/d was recorded for 2021, which is approximately 54 percent of the plant's rated capacity of 1,816 m^3/d. The Colchester Sanitary Capacity Study Report completed in July of 2022 (available in **Appendix B**), identified that the pumping stations, sewer network, and treatment facility have the capacity to service the current level of development within the existing service area. However, new development pressures are causing an increase in wastewater servicing demands. Thus, additional treatment capacity would be necessary to handle additional sewage flows from future developments and maintain effluent quality that meets MECP criteria.

This environmental assessment has been triggered by a new development that is proposed west of the Colchester Urban Centre, Colchester Bay Development, which would significantly increase sewage flows. The proposed development will consist of, mixed style residential units, parkland, and a hotel with commercial retail space. This development has the potential to generate socio-economic and environmental benefits within the community. The Colchester Bay Development is proposed in two phases, Phase 1 (~15.5 ha) is outside of the existing service area and Phase 2 (~9.0 ha) is an expansion to both the existing service area and the existing settlement area. It is unclear whether Phase 2 will be approved by the Town of Essex Planning department, as the settlement area undergoes a comprehensive review. For the purposes of this study, sewage servicing analysis will be presented for Phase 1 (only) and Phase 1 and 2 (combined). Preliminary design concepts are presented for Phase 1 and 2 (combined) and may be refined during the detailed design period.

This development is anticipated to generate a significant increase in wastewater servicing demands beyond the capacity of the existing Colchester South Sewage Works. The study will determine a long-term solution to accommodate increased wastewater servicing demands from the proposed development as well as other future developments and population growth in the existing Colchester South service area. This ESR will identify, evaluate, and report on the preferred design solution and design concepts to address this problem / opportunity statement.

4.0 ALTERNATIVE DESIGN SOLUTIONS

The previous sections of the ESR provide background information regarding this project and outline the problem / opportunity statement for the Colchester Sewage Works in fulfillment of Phase 1 of the Class EA process. The following sections presents the details of work undertaken as part of Phase 2 of the Class EA process. Phase 2 involves the identification and evaluation of various conceptual alternatives with the objective of determining alternative solutions which best address the identified problems and needs based on the potential impact to the natural, social, and economic environments.

The criteria used to develop the alternative design solutions were based on generally accepted principles and previous experience. The criteria included the following:

- Application of current engineering practices and standards;
- Adherence to applicable laws and regulations;
- Economic considerations;
- Operation and maintenance issues;
- Health and safety;
- Acceptability to concerned stakeholders; and
- Feasibility of implementation.

The Municipal Class EA process in Ontario defines the requirements for the development of a reasonable range of alternatives including a Do-Nothing option to provide a benchmark for the evaluation process. The development of potential alternatives should also consider technical feasibility, social impact, natural environmental impacts, and economic impacts. The purpose of this section is to consider reasonable solutions to the defined problem. Some solutions may be touched upon briefly, but not considered as viable options for further evaluation due to unacceptable social, economic, and/or natural environmental impacts.

4.1 INTRODUCTION

In this section of the report, alternative design solutions will be identified and evaluated leading to the selection of the recommended design. Several conceptual alternative solutions were proposed to address the identified problems and needs of the Colchester South Sewer System. The following broad planning level alternative solutions have been considered and will be outlined in the following sections:

Alternative No. 1: Do Nothing
Alternative No. 2: Restrict Community Growth
Alternative No. 3: Reduce Sewage Flows and Inflow and Infiltration (I&I)
Alternative No. 4: Modify Operations
Alternative No. 5: Discharge to Wastewater Treatment Plant (WWTP) Outside of the Colchester South Community
Alternative No. 6: Independent Onsite WWTP
Alternative No. 7: Expand and Upgrade Colchester South Sewage Works

The seven alternative solutions were evaluated based on a variety of social, natural environmental, economic, technical and cultural heritage criteria. These evaluation criteria were developed based on servicing needs at the wastewater treatment facility, applicable municipal plans / commitments, design principles, and past industrial experience. The evaluation criteria are as follows:

Technical Criteria:

- Ability to meet current and future wastewater servicing needs;
- Constructability, implementation timeline, and phasing;
- Flexibility to meet future needs and/or climate change projections; and
- No adverse impacts on existing infrastructure (operations and/or maintenance).

Social Criteria:

- Impact to archaeological, built heritage, and cultural heritage;
- Noise, vibration, odour, or air pollution emissions;
- Permanent changes or impacts to society / community;
- Development policies and agreements; and
- Ability to increase development and improve housing supply.

Natural Environmental Criteria:

- Impacts to vegetation, fish and wildlife, areas of natural and scientific interest, environmentally sensitive areas, and soil / geology;
- Regulatory compliances; and
- Development and planning policies.

Economic Criteria:

- Capital, operational and maintenance (O&M) costs; and
- Ability to improve development and generate economic growth.

Cultural Heritage Criteria:

- Impacts to archaeological sites or areas of archaeological potential; and
- Impacts to known or potential built heritage resources and cultural heritage landscapes.

The advantages and disadvantages of each alternative together with their effects on the socioeconomic and natural environment are discussed in the following sections.

4.2 DESCRIPTION OF ALTERNATIVE DESIGN SOLUTIONS

4.2.1 Alternative No. 1: Do Nothing

4.2.1.1 Overview

The "Do Nothing" option sets a benchmark for the evaluation and is a required component of the Municipal Class EA process. This option assumes that nothing is done to address the stated problem and the existing Wastewater Treatment Facility would continue to be used for wastewater needs in the community of Colchester. Although this may be an acceptable short-term solution, this is not considered a viable long-term solution.

4.2.1.2 Screening Result

In terms of the evaluation criteria, this solution would not have the ability to meet future wastewater servicing needs and may result in adverse impacts to the operation and maintenance of the existing infrastructure. It would not allow for the Town to accommodate development or increase housing supply in within the community, which represents a significant opportunity to generate socio-economic growth. Further to these issues, the MECP is continuously making effluent quality requirements more stringent and failure to upgrade the existing infrastructure will result in the inability to meet regulatory compliance.

Overall, it is clear the do-nothing approach will have an adverse economic impact due to the stagnation of development. This alternative does not address the increase in wastewater servicing demands. For these reasons, Alternative No. 1 – Do Nothing was not considered a viable solution and was not carried forward for detailed evaluation.

4.2.2 Alternative No. 2: Restrict Community Growth

4.2.2.1 Overview

Under this strategy, wastewater would continue to be collected and processed using the existing Colchester South Sewage Works. Community development or growth would be limited to an average wastewater flow of approximately 1,816 m^3/d, which is the equivalent of approximately 4,000 people. Although this would allow for some level of development in the region, the existing population is approximately 2,334, it would not allow for any significant developments in the service area. Although this may be an acceptable short-term solution, this is not considered a viable long-term solution.

4.2.2.2 Screening Result

In terms of the evaluation criteria, this solution would not have the ability to meet future wastewater servicing needs within the existing service area. It would not allow for the Town to accommodate development or increase housing supply in within the community, which represents a significant opportunity to generate socio-economic growth.

Further to these issues, the MECP is continuously making effluent quality requirements more stringent and failure to upgrade the existing infrastructure will result in the inability to meet regulatory compliance.

Similarly to Alternative No. 1, Alternative No. 2 – Restrict Community Growth was not considered a viable solution and was not carried forward for detailed evaluation.

4.2.3 Alternative No. 3: Reduce Sewage Flows and I&I

4.2.3.1 Overview

Under this strategy, wastewater would continue to be collected and processed using the existing Colchester South Sewage Works and efforts would be made to reduce sewage flows and inflow and infiltration. Wastewater flows to the sewage system may be reduced by repairing the sewer system to correct infiltration and inflow problems and by implementing community education programs such as a water conservation program. However, the reduction in sewage flow by these methods will not recover sufficient capacity in the existing sewage treatment facilities to accommodate the projected community growth. Therefore, the reduction of sewage flows by itself is not a complete solution. This may be an acceptable short-term solution, but it is not considered a viable long-term solution.

4.2.3.2 Screening Result

Similarly, Alternative No.'s 1 and 2, this solution would not have the ability to meet future wastewater servicing needs within the existing service area. It would not allow for the Town to accommodate significant development or increase housing supply in within the community, which represents an opportunity to generate additional socio-economic growth. Further to these issues, the MECP is continuously making effluent quality requirements more stringent and failure to upgrade the existing infrastructure will result in the inability to meet regulatory compliance.

For these reasons, Alternative No. 3 – Reduce Sewage Flows and I&I was not considered a viable solution and was not carried forward for detailed evaluation.

4.2.4 Alternative No. 4: Modify Operations of Existing Infrastructure

4.2.4.1 Overview

Under this strategy, wastewater would continue to be collected and processed using the existing Colchester South Sewage Works and efforts would be made to modify operation of the existing infrastructure to accommodate additional flows. Additional flows may be accommodated through operational changes such as performing sludge removal or increasing operating depth to increase the hydraulic capacity of the lagoons. However, these operational changes would not be sufficient to accommodate the projected community growth. This may be an acceptable short-term solution, but it is not considered a viable long-term solution.

4.2.4.2 Screening Result

Similarly to the previous alternatives, this solution would not have the ability to meet future wastewater servicing needs within the existing service area. It would not allow for the Town to accommodate significant development or increase housing supply in within the community, which represents an opportunity to generate additional socio-economic growth. Further to these issues, the MECP is continuously making effluent quality requirements more stringent and failure to upgrade the existing infrastructure will result in the inability to meet regulatory compliance.

For these reasons, Alternative No. 4 – Modify Operation of Existing Infrastructure was not considered a viable solution and was not carried forward for detailed evaluation.

4.2.5 Alternative No. 5: Discharge to WWTP Outside of the Colchester South Community

4.2.5.1 Overview

Under this strategy, wastewater would be collected and processed at a wastewater treatment facility outside of the Colchester community. The nearest sewage treatment facility outside of the community is the Harrow Sewage Works located in Harrow lots 6 and 7, Registered Plan 202, 2nd Concession Road. Discharge of the Colchester sewage to this facility would require extensive modifications to the existing pumping station and construction of a sewage pipeline approximately 5 kilometers long from Pumping Station No.1 to the Harrow facility. More importantly, since the residual capacity in the Harrow facility has been allocated to community growth in that area, an expansion would be necessary to receive sewage from the Colchester South service area.

4.2.5.2 Screening Result

In terms of the evaluation criteria, this solution would have the ability to meet future wastewater servicing needs in the short and long-term. It would allow for the Town to accommodate development or increase housing supply in within the community, which represents a significant opportunity to generate socio-economic growth. This solution would require the installation of a 5 km forcemain through the communities of Colchester and Harrow and the expansion or upgrading of the Harrow Wastewater Treatment Facility. Therefore, it would have a higher impact on the natural environment and society as a whole. This alternative has higher potential for impact on archaeological, built heritage and/or cultural heritage resources as opposed to other alternatives as the construction would take place in a broad area. This solution would come at a significant capital cost investment. Amalgamating the two wastewater treatment facilities would likely reduce the operating and maintenance costs.

Overall, it is clear this approach will have an adverse economic, environmental, social, and potentially cultural heritageimpacts. For these reasons, Alternative No. 5 – Discharge to WWTP Outside of the Colchester South Community was not considered a viable solution and was not carried forward for detailed evaluation.

4.2.6 Alternative No. 6: Independent WWTP at New Development

4.2.6.1 Overview

Under this strategy, wastewater from the Colchester Bay Development would be collected and processed at an independent wastewater treatment facility located on the development site. The independent WWTP would be designed to accommodate the proposed Colchester Bay Development with a preliminary average daily sewage flow of 1,396 m^3/d and a peak sewage flow of 3,842 m^3/d. The approximate length of the outlet sewer would be 450 m. This alternative would not provide a solution for the increase of wastewater servicing demands from the other proposed developments in the existing service area, therefore a capacity upgrade to the Colchester South wastewater treatment facility would still be required in the future.

4.2.6.2 Screening Result

In terms of the technical criteria, this solution would provide adequate capacity for the Colchester Bay Development. Although it would limit the flexibility to accommodate additional developments or wastewater flows from other areas within the service area. In terms of the social and natural environmental impact, the independent WWTP would be located at a distance of less than 1 km from the urban community centre and the outlet would be located approximately 600 m upstream of the Colchester Harbor and Beach. This would result in a higher level of impact to the society. The implementation of this facility would have low potential for impact to the natural environment. There is some potential for impact to archaeological, built heritage, and/or cultural heritage resources depending on the exact location of the independent WWTP. There are three (3) designated heritage properties listed on the Town of Essex's website that are in close proximity to potential sites for the construction of the independent WWTP; the Colchester Schoolhouse at 195 Bagot Street, Christ Church at 190 Bagot Street and a Victorian era farmstead at 400 County Road 13. In terms of the economic impact, this solution would come at a higher capital cost requirement and significant operations and maintenance requirements. However, this would allow the ability to accommodate development within the development site and generate economic growth.

Overall, the implementation of an independent wastewater treatment facility would accommodate the Colchester Bay Development. In consideration of the factors discussed above, Alternative No. 6 – Independent WWTP at New Development was carried forward for further evaluation.

4.2.7 Alternative No. 7: Upgrade Colchester South Sewage Works

4.2.7.1 Overview

Under this strategy, wastewater would continue to be collected and processed using the existing Colchester South Sewage Works. Upgrades to the sewage works would be performed to accommodate flow for all proposed developments and future developments within the service area.

4.2.7.2 Screening Result

In terms of the evaluation criteria, this solution would have the ability to meet future wastewater servicing needs and would not result in adverse impacts to the operation and maintenance of the existing infrastructure. It would allow for the Town to accommodate development or increase housing supply within the community, which represents a significant opportunity to generate socio-economic growth. This alternative would require less complex construction and allow for flexibility to adjust to future need and meet phasing requirements for the whole service area. Further, upgrading the treatment processes would allow the facility to meet more stringent effluent criteria that is expected in the future.

In terms of social and natural environmental impacts, this solution would be the least influential. There would be no changes to the existing outfall structure and low potential for impacts to the natural environment. There is potential for impacts to the archaeological, built heritage, and/or cultural heritage resources upon implementation of these upgrades because according to the Town of Essex's website, a designed heritage property, the Hutchins Family Cemetery is located on the property adjacent to the existing facility. In terms of the economic impacts, this solution would require a lower capital cost investment and operation and maintenance requirements.

Overall, it is clear that upgrading the sewage works would accommodate the increasing development pressures within the service area. In consideration of the factors discussed above, Alternative No. 7 – Upgrade Colchester South Sewage was carried forward for further evaluation.

4.3 EVALUATION OF ALTERNATIVE DESIGN SOLUTIONS

Based on the preliminary evaluation and screening results provided in the previous sections Alternative No.'s 6 and 7 were selected for additional detailed evaluation. The other alternatives were not carried forward for additional detailed evaluation due to negative social, natural environmental, economic or cultural heritage impacts.

In order to objectively compare Alternative No. 6 and 7, an evaluation matrix with a colour rating scale system was utilized. For each of the evaluation criteria the alternatives were assessed and awarded a rating in the colour range of red, yellow, green, or dark green with red being the least desirable and dark green being the most desirable. The description of the colour rating is presented in **Table 4.1**. The evaluation of alternative design solutions is presented in **Table 4.2**.

Table 4.1: Description of Colour Rating for Evaluation Criteria

Colour	Scale	Description
🔴	Poor	Unsuitable or not fit for the desired application; negative impacts; disadvantageous; and/or undesirable given the project timeline, budget, scope, and standards.
🟡	Fair	Acceptable for the desired application; minimal negative impacts; adequate given the project timeline, budget, scope, and standards.
🟢	Good	Suitable or good for the desired application; negligible impacts; and/or agreeable given the project timeline, budget, scope, and standards.
🟢	Great	Favourable; positive impacts; advantageous; excellent given the project timeline, budget, scope, and standards.

Table 4.2: Evaluation of Alternative Design Solutions

Evaluation Criteria	Alternative 6: Independent Onsite WWTP	Alternative 7: Expand & Upgrade Colchester South Sewage Works
Technical Suitability	🔴 **Poor** • Unable to accommodate additional developments or wastewater flows from other areas within the service area • More complex construction and operation • Rigid implementation timeline and phasing • Less flexible to adjust to future needs	🟢 **Great** • Able to accommodate additional developments or wastewater flows from other areas within the service area • Less complex construction and operation • Flexible implementation timeline and phasing • More flexible to adjust to future needs
Social	🔴 **Poor** • WWTP would be <1 km from the Town Center • Outlet would be approximately 600 m upstream of the Colchester Harbor and Beach • Higher impacts to society	🟢 **Good** • No changes to the existing outlet • Lower impacts to society
Natural Environment	🟡 **Fair** • Minimal impact to the natural environment • Complicated approval and permitting process	🟢 **Good** • Minimal impact to natural environment • ECA Amendment

Evaluation Criteria	Alternative 6: Independent Onsite WWTP	Alternative 7: Expand & Upgrade Colchester South Sewage Works
Economic	**Poor** • Higher capital investment and O&M cost • Ability to accommodate development within the development site and generate economic growth	**Good** • Lower capital investment and O&M cost • Ability to accommodate development within the entire service area and generate additional economic growth
Cultural Heritage	**Fair** • Designated cultural heritage properties and archaeological resources are located in close proximity to potential construction sites.	**Fair** • Designated cultural heritage properties and archaeological resources are located in close proximity to the potential construction site.
Overall	**Poor**	**Good**

4.4 RECOMMENDED SOLUTION

The most preferred alternative and therefore the recommended solution was determined to be Alternative No. 7 – Expand and Upgrade the Colchester Sewage Works. This solution will provide a capacity that will accommodate the existing community and future population growth in the Colchester South service area. In terms of the technical suitability, expanding and upgrading the Colchester South Sewage Works would require less complex construction and operation requirements. This solution would also have a more flexible implementation timeline which can be adjusted to meet the needs of the community as a whole.

In terms of the social and natural environment, this solution is a part of the original system design and is a planned requirement for the Colchester South Sewage Works. Increasing development pressures would necessitate these planned upgrades earlier than originally expected. The proposed expansions and upgrades will be designed in accordance with MECP Design Guidelines for Sewage Works which would mitigate potential negative impacts to the community and/or natural environment. For this solution, an amendment would be required to the existing ECA. In addition, the upgrade should incorporate a treatment process that will satisfy more stringent MECP effluent quality criteria for discharge into Lake Erie. In terms of the economic requirements, this solution would require a lower capital cost investment and O&M costs with a greater benefit to the community as a whole. Several treatment process alternatives are available, they are identified and evaluated in **Section 6.0.**

5.0 SEWAGE SERVICING ANALYSIS

This section of the report provides an overview of the anticipated population and wastewater flow for the service area in 20-years (20-year Design) and beyond the next 20-years (Ultimate Design). Further, this section presents the sewage servicing analysis and impact of the projected wastewater flow on the existing Sewage Works (pumping stations, collection system, and wastewater treatment facility). The requirements for Sewage Works upgrades were identified based on this sewage servicing analysis and further evaluated in **Section 6** and **Section 7**.

5.1 POPULATION AND FLOW PROJECTIONS

5.1.1 Existing Service Area Projections

The existing Colchester South sanitary service area extends from County Road 41 on the west to County Road 13 and Island View Lane on the east, from the northern town limit (Ogden Street) and County Road 50 on the north to the shoreline of Lake Erie on the south. Refer to **Figure 1.2** of the existing Colchester South service area.

In addition to the Colchester Bay development, the completion of six (6) other developments is anticipated within the next 20 years. Unlike Colchester Bay, these developments are proposed inside the existing service area as per the Town of Essex's Official Plan. The six (6) developments listed in **Table 5.1** below, were identified through the Town of Essex's Interactive Mapping Service from the layer, 'Developments in the Town of Essex'. These proposed developments (Erie Blue, Erie Shores, Colchester Heights, Wellesley Drive, Lypps Beach, and The Grove Motel) are located within the existing Colchester South service area, refer to **Figure 5.1** for the location of these proposed developments. The area, in hectares, for each development was obtained through the interactive mapping service.

Table 5.1: 20-Year Projections for Existing Service Area

Development	Area (ha)	Population	Flow (m^3/d)		Anticipated Completion Date
			Average	Peak	
1. Erie Blue	10.4	364	164	851	< 20 Years
2. Erie Shores	8.9	312	140	732	< 20 Years
3. Colchester Heights	5.4	189	85	452	2023/2024
4. Wellesley Drive	3.4	119	54	288	2023/2024
5. Lypps Beach	35.9	1,257	565	2,763	< 20 Years
6. The Grove Motel	0.35	13	5.7	31	Spring 2023
Developed Existing Service Area	190.0	2,775	1,249	7,782	-
Total Existing Service Area	**418** (1)	**5,028**	**2,262**	**12,898**	-
Note: (1) Includes undeveloped (i.e., unserviced) lands within the existing service area.					

In the next 20 years, the existing service area is estimated to have an average daily flow of 2,262 m^3/d and a peak daily flow of 12,898 m^3/d. These flow projections do not include the Colchester Bay development which is a proposed expansion to the existing service area. These flow estimates would suggest that the Colchester South service area requires sewage upgrades within the next 20 years regardless of the Colchester Bay development, due to the projected average daily flow of 2,262 m^3/d which exceeds the sewage works current rated capacity of 1,816 m^3/d.

The projected 20-year population and design flows for these developments were calculated based on the Town of Essex Development Manual, unless otherwise stated. The sanitary design criteria are shown in **Table 5.2**, below.

Table 5.2: Summary of Sanitary Design Criteria for 20-Year Projections

Design Component	Design Criteria	Source
Population Density	Low-Medium Density Residential 35 persons per hectare	Assumption based on original sewer system design
Population Growth Rate	21 people per year OR 0.9% per year	Statistics Canada 2021 Census
Average Domestic Flow Peaking Factor	450 litres per capita per day Harmon formula applied to average domestic flow $1+14/(4+P^{0.5})$ P = population in thousands Minimum Peaking Factor = 2.0	Town of Essex Development Manual
Extraneous Flow	0.21 litres per hectare per second	Town of Essex Development Manual
Common Sewage Flow Rates for Commercial and Institutional Uses	Motels 190 litres per unit per day	MECP Design Guidelines for Sewage Works

The Town of Essex Development Manual does not provide a population density for low-medium density residential zones. Therefore, a value of 35 persons per hectare was assumed to calculate the population for Development No.'s 1 through 5 in **Table 5.1**. This population density is typical for low-medium density residential zones and is consistent with the original sewer system design in Colchester South. The average flow was estimated using an average domestic flow rate of 450 L/capita/d, as per the sanitary design criteria. The peak flow was estimated using the Harmon peaking factor plus the addition of extraneous flow (inflow and infiltration). Extraneous flow was determined as per the design criteria with a value of 0.21 L/ha/s.

The common sewage flow rate of 190 L/unit/day for hotels and motels from the MECP Design Guidelines for Sewage Works was used to determine the equivalent population and flow from Development No. 6, The Grove Motel. Based on the developer's preliminary drawings of The Grove Motel, there was assumed to

be 30 units which equates to an equivalent population of 13 persons. This equivalent population was used to calculate the average and peak flows as described for the other developments.

In order to project the 2042 population within the developed portion of the existing service area, an estimated population growth rate was assumed based on the 2016 and 2021 Statistics Canada information for Colchester. Between 2016 and 2021 the population increased by 4.5 % (0.9 % per year) which is equivalent to an additional 21 people per year. Based on this rate the estimated population in the year 2042 would be approximately 2,775 (not including proposed developments). The average and peak flows for the existing service area were calculated using the standard design criteria as described for the proposed developments.

The total existing service area is 418 ha which was recorded from the original sewer system design report and crosschecked with the Town of Essex interactive map. The total population and flows are the sum of those for the developed existing service area and proposed developments.

5.1.2 Expanded Service Area Projections

A new development, Colchester Bay, is proposed west of the Colchester Urban Centre and north of County Road 50, see **Figure 5.1**. The proposed development will consist of, mixed style residential units, parkland, and a hotel with commercial retail space. There are two phases of the Colchester Bay development, Phase 1 (~15.5 ha) is within the allowable development area outlined in the Town of Essex's Official Plan but outside of the existing service area. Phase 2 (~9.0 ha) is proposed outside of the allowable development area outlined in the Town of Essex's Official Plan and outside the existing service area. The settlement area is undergoing a comprehensive review, and it is unclear whether Phase 2 will be approved. Phase 1 includes Draper, Harrison, and Herring Street while Phase 2 includes Ogden Street.

Table 5.3 below, shows the 20-year population and flow projections for the proposed expansion of the service area to include the Colchester Bay development. The flows and areas presented for Phases 1 and 2 were provided by the Developer.

Table 5.3: 20-Year Projections for Expanded Service Area

	Area (ha)	Population	Flow (m^3/d)	
			Average	Peak
Existing Service Area	418.0	5,028	2,262	12,898
Colchester Bay (Phase 1)	15.5	-	817	2,644
Total Expanded Service Area (Phase 1)	**433.5**	-	**3,080**	**15,542**
Colchester Bay (Phase 2)	9	-	579	1,198
Total Expanded Service (Phase 1&2)	**442.5**	-	**3,659**	**16,739**

The total expanded service area including both phases of the Colchester Bay development is estimated to have an average daily flow of 3,659 m^3/d and a peak daily flow of 16,739 m^3/d. If both phases of Colchester Bay are approved, this development alone is estimated to have an average daily flow of 1,396 m^3/d and a peak daily flow of 3,842 m^3/d. On its own, the Colchester Bay development would occupy 77% of the sewage works current rated capacity of 1,816 m^3/d which is more than the existing service area's 2015-2021 historical daily average of 1,032 m^3/d. Therefore, it is evident that the Colchester Bay development in itself would require capacity upgrades to the existing sewage works.

5.1.3 20-Year and Ultimate Design Sewage Flows

The 20-year and ultimate design sewage flows are based on the projections outlined above. The **Table 5.4,** below provides the design sewage flows and equivalent populations for the existing design, the 20-year design, and the ultimate design. The 20-year design is estimated to have the capacity to treat sewage flows from existing residents, proposed developments, and natural population growth over a 20-year period from the date of design. Upgrades to the existing sewage works (20-year design) will include phasing or consideration to accommodate future expansions to an ultimate capacity of 7,500 m^3/d with minor retrofits.

Table 5.4: Existing, 20-Year and Ultimate Design Sewage Flows

Parameter	Existing Design	20-Year Design	Ultimate Design
Equiv. Population	4,000	8,222	16,667
Average Sewage Flow (m^3/d)	1,816 (21 L/s)	3,700 (43 L/s)	7,500 (87 L/s)
Peak Sewage Flow (m^3/d)	8,122 (94 L/s)	16,800 (194 L/s)	32,800 (380 L/s)

5.2 IMPACT ON EXISTING PUMPING STATIONS

5.2.1 Overview

This section of the report outlines the sewage servicing analysis and recommended upgrades for the Colchester South Pumping Stations in order to accommodate the 20-year population and flow projections within the existing service area as well as the addition of the Colchester Bay Development. The pumping stations may be upgraded to the ultimate design capacity through pump replacements and/or pump upgrades.

5.2.2 Sewage Servicing Analysis

Table 5.5 displays the cumulative area, equivalent population, and anticipated peak flow (Q_{peak}) at each pumping station for the projected development scenarios. This includes the 20-year projection, 20-year projection with the addition of the Colchester Bay Development Phase 1, and 20-year projection with the addition of the Colchester Bay Development Phase 1 and 2. The projected area, equivalent population, and peak flow conditions for the 20-year projection were calculated based on the descriptions provided in

Section 5.1. The projected area, equivalent population, and flow conditions for the Colchester Bay Development (Phase 1 and 2) were provided by the developer.

In addition, **Table 5.5** displays the pumping station firm design capacity based on the MECP ECA. The design capacities outlined in the ECA were verified and confirmed to match the existing pumps installed at each pumping station. The ECA design capacities at each pumping station are shown as a point of comparison since any development which results in a peak flow significantly greater than the design capacity would require a pumping station upgrade.

For the 20-year projection scenario, this comparison shows that Pumping Station No.'s 1, 2, and 3 have a projected peak flow greater than the existing firm capacity and therefore would require capacity upgrades within the next 20 years. These upgrades align with expectations since all of the pumping stations in Colchester South were originally designed to be upgraded to meet future needs. The lands serviced by Pumping Station No.'s 1, 2, and 3, still have a significant amount of area to be connected to the sewer system and the six (6) anticipated developments outlined in **Table 5.1** may occur periodically throughout the next 20 years. The development plans within these area's should be monitored and pumping station upgrades should be completed to meet development needs. Without the Colchester Bay development, Pumping Station No.'s 5, 6, and 7 have projected peak flows less than the existing firm capacity and therefore would not require upgrades within the next 20 years.

For the 20-year projection scenario with the addition of the Colchester Bay Development (Phase 1 and/or Phase 1 and 2), all the pumping stations have a projected peak flow greater than the existing firm capacity and therefore would require capacity upgrades within the next 20 years. These upgrades align with expectations since all of the pumping stations in Colchester South were originally designed to be upgraded to meet future needs. The upgrade requirements for Pumping Station No.'s 1, 5, 6, and 7 are increased due to the Colchester Bay Development which is occurring outside of the existing service area. The region still has a significant amount of area to be connected to the sewer system and anticipated developments may occur periodically throughout the next 20 years. The development plans within these area's should be monitored and pumping station upgrades should be completed to meet development needs.

A summary of the pumping station upgrades and opinion of probable cost for these upgrades are shown in **Section 5.2.4** and **Section 5.2.5**, respectively. **Table 5.6** outlines the peak sewage flow at each pumping station which would necessitate or 'trigger' a pumping station upgrade. Further, this table indicates which of the anticipated developments outlined in **Table 5.1** would trigger each upgrade.

Note, additional municipal class environmental assessments and/or sewage capacity studies would be required if any of the six (6) anticipated developments outlined in **Table 5.1** are proposed to be developed (i) with a population density greater than 35 people per hectare and/or (ii) with sewage flow rates greater than that outlined in the Town of Essex Development Manual .

Table 5.5: Summary of Cumulative Inlet Raw Sewage Flows at Pumping Stations

PS No.	ECA Pumping Station Capacity	20-Year Projection			20-Year Projection + Colchester Bay (Phase 1)			20-Year Projection + Colchester Bay (Phase 1 & 2)		
	Q_{peak} (L/s)	Area (ha)	Equiv. Pop. (persons)	Q_{peak} (L/s)	Area (ha)	Equiv. Pop. (persons)	Q_{peak} (L/s)	Area (ha)	Equiv. Pop. (persons)	Q_{peak} (L/s)
1	**94.2**	249	5,028	149.3	265	6844	179.9	274	8131	193.7
2	**34.5**	90	1,973	59.0	90	1974	59.0	90	1974	59.0
3	**6.5**	33	754	23.0	33	754	23.0	33	754	23.0
4	**-**	-	-	-	-	-	-	-	-	-
5	**42.4**	73	1,067	36.5	89	2883	67.1	98	4170	80.9
6	**48.7**	89	1,268	43.4	105	3071	74.0	114	4358	87.9
7	**52.7**	98	1,373	47.2	114	3176	77.8	123	4463	91.6

5.2.3 Upgrade Trigger Summary

Development which would result in sewage flows exceeding the ECA pumping capacity would necessitate or 'trigger' a pumping station upgrade. **Table 5.6** outlines the theoretical existing sewage flow at each pumping station, ECA pumping station capacity, and names of developments which would trigger each pumping station upgrade.

The existing peak sewage flow conditions were calculated based on the population of Colchester South (2021 Statistics Canada Census projected to 2023) and the standard sewage design criteria outlined in **Table 5.2.** Further, the flow at each pumping station was estimated by distributing the population and flow to individual manholes based on the number of contributing dwellings observed in aerial photographs.

Table 5.6: Summary of Pumping Station Upgrade Triggers

Pumping Station No.	Existing Sewage Flow	ECA Pumping Station Capacity	Development Triggering PS Upgrade
	Q_{peak} (L/s)	Q_{peak} (L/s)	**Development Name**
1	72.9	94.2	Erie Blue, Erie Shores, Colchester Heights, and Wellesley Drive Developments **OR** Lypps Beach Development **OR** Colchester Bay Development
2	28.3	34.5	Erie Blue Development **OR**

Pumping Station No.	Existing Sewage Flow	ECA Pumping Station Capacity	Development Triggering PS Upgrade
	Q_{peak} (L/s)	Q_{peak} (L/s)	**Development Name**
			Erie Shores Development
3	4.2	6.5	Erie Blue Development **OR** Erie Shores Development
4	-	-	-
5	29.4	48.7	Colchester Bay Development
6	35.0	52.7	Colchester Bay Development
7	38.1	94.2	Colchester Bay Development

5.2.4 Recommended Upgrades

Table 5.7 summarizes the proposed upgrades to the Colchester South sewage pumping stations based on the projected level of development in the region.

- Pumping Station No. 1 is proposed to be upgraded to service anticipated development occurring in the next 20-years within the existing service area as well as the proposed Colchester Bay Development. This pumping station upgrade would be required regardless of the Colchester Bay Development.

- Pumping Station No.'s 2 and 3 are proposed to be upgraded to service anticipated development occurring in the next 20-years within the existing service area. These pumping station upgrades would be required regardless of the Colchester Bay Development.

- Pumping Station No.'s 5, 6, and 7 are proposed to be upgraded to service the Colchester Bay Development. These pumping station upgrades would not be required in the next 20-years if the Colchester Bay Development does not occur.

It is assumed that the proposed pumping station upgrades will include replacing the existing pumps with higher capacity pumps within the existing footprint of the pumping station such that structural upgrades are not required. The proposed firm capacity for the pumping station upgrades is approximate and may vary subject to available pumping equipment which suits the existing footprint.

Note, additional municipal class environmental assessments and/or sewage capacity studies would be required if any of the anticipated developments are proposed to be developed (i) with a population density greater than 35 people per hectare and/or (ii) with sewage flow rates greater than that outlined in the Town of Essex Development Manual.

Table 5.7: Recommended Pumping Stations Upgrades

PS No.	EXISTING	20-YEAR PROJECTION			PROPOSED UPGRADE			ULTIMATE CAPACITY	
	ECA Capacity (L/S)	20-Year Q_{peak} (L/S)	20-Year + CB Phase 1 Q_{peak} (L/S)	20-Year + CB Phase 1 & 2 Q_{peak} (L/S)	Description	Firm Capacity (1) (L/s)	Design Basis	Original Ultimate Capacity (L/s)	Upgraded Ultimate Capacity (L/s)
1	94.2	149.3	179.9	193.7	Equipment Replacement	194	20-Year + CB 1&2	335.2	379.7
2	34.5	59.0	59.0	59.0	Equipment Replacement	59	20-Year	102.8	N/A
3	6.5	23.0	23.0	23.0	Equipment Replacement	23	20-Year	34.7	N/A
4	-	-	-	-	-	-	-	13.0	N/A
5	42.4	36.5	67.1	80.9	Equipment Replacement	81	20-Year + CB 1&2	100.2	144.7
6	48.7	43.4	74.0	87.9	Equipment Replacement	88	20-Year + CB 1&2	114.3	158.8
7	52.7	47.2	77.8	91.6	Equipment Replacement	92	20-Year + CB 1&2	151.3	195.8

Notes:
(1) The proposed firm capacity for the pumping station upgrades is approximate and may vary subject to available pumping equipment which suits the existing footprint.

5.2.5 Opinion of Probable Cost

Table 5.8 summarizes the probable cost for the proposed pumping station upgrades. The following is a summary of the key assumptions applied for the probable cost analysis:

- The Probable Costs are presented in 2023 dollars.
- Equipment costs are based on vendor supplied price quotations and historic pricing of similar equipment.
- The capital cost is estimated from equipment cost plus 50% installation cost.
- The level of accuracy in projecting costs at this stage of development of a project is typically plus or minus 15% or greater and can be refined as the project develops to a level of plus or minus 10% just prior to tendering. However, the level of accuracy cannot be guaranteed, and the actual final cost of the project will only be determined through the tendering and construction process.

Table 5.8: Summary of Probable Cost for Proposed Pumping Station Upgrades

PS No.	Proposed Upgrade		Trigger	Probable Cost
	Description	Firm Capacity (L/s)		
1	Equipment Replacement	194	Erie Blue, Erie Shores, Colchester Heights, and Wellesley Drive Developments **OR** Lypps Beach Development **OR** Colchester Bay Development	To be evaluated with the upgrades of the Colchester South Wastewater Treatment Facility.
2	Equipment Replacement	59	Erie Blue Development **OR** Erie Shores Development	$500,000
3	Equipment Replacement	23	Erie Blue Development **OR** Erie Shores Development	$250,000
4	-	-	-	-
5	Equipment Replacement	81	Colchester Bay Development	$750,000
6	Equipment Replacement	88	Colchester Bay Development	$750,000
7	Equipment Replacement	92	Colchester Bay Development	$750,000
Sub-total Construction Cost				**$3,000,000**
Contingency Allowance (30%)				$900,000
Engineering Allowance (15%)				$450,000
TOTAL CAPITAL COST (excluding taxes)				**$4,350,000**

5.3 IMPACT ON EXISTING SEWAGE COLLECTION SYSTEM

5.3.1 Overview

This section of the report outlines the sewage servicing analysis for the Colchester South Wastewater Collection System and Colchester Bay Development. The sewage servicing analysis for the collection system takes into account the ultimate population and flow projections within the existing service area in order to determine the impacts to sewer capacity due to the Colchester Bay Development.

5.3.2 Sewage Servicing Analysis

5.3.2.1 Baseline Analysis (No Colchester Bay Development)

Existing Wastewater Flows

Figure 5.2 depicts the existing wastewater collection system and existing pumping stations with wastewater flows from the existing level of development in Colchester South. The existing level of development was determined based on aerial photographs of the existing residences in the service area. The figure shows the capacity of the sewer network when operating under peak design flow conditions and all sewers were computed to have adequate capacity (shown in green).

Projected Wastewater Flows without the Colchester Bay Development

Figure 5.3 depicts the existing wastewater collection system and upgraded pumping stations (original ultimate capacity) with the anticipated wastewater flows from the 'ultimate' level of development in the existing Colchester South service area. The 'ultimate' level of development (subsequently referred to as the 'fully built out service area') was determined based on the aerial photographs of the existing residences and assumes ALL remaining lots will be filled in / built based on the Town of Essex Development Manual. There is no defined timeline for the remaining lots to be filled in. The figure shows the capacity of the sewer network when operating under peak design flow conditions and most of the sewers were computed to have adequate capacity (shown in green). There are some sewers that had marginal capacity (shown in yellow); however, these are attributed to shallow sewer grades and are not anticipated to pose any issues to the overall effectiveness of the collection system.

5.3.2.2 Colchester Bay Phase 1 Analysis

Projected Wastewater Flows with the Colchester Bay Development Phase 1 (Single Outlet)

Figure 5.4 depicts the existing wastewater collection system and upgraded pumping stations (upgraded ultimate capacity) with the anticipated wastewater flows from the 'fully built out service area' plus the addition of the Colchester Bay Development Phase 1. In this scenario, the entire flow (30.66 L/s) for the Colchester Bay Development is all directed to a single outlet on Harrison Street (MH061). This figure shows that if the flow was directed to a single outlet some local sewers would exceed their design capacity (shown in red).

Projected Wastewater Flows with the Colchester Bay Development Phase 1 (Multi-Outlet)

Figure 5.5 depicts the existing wastewater collection system and upgraded pumping stations (upgraded ultimate capacity) with the anticipated wastewater flows from the 'fully built out service area' plus the addition of the Colchester Bay Development Phase 1. In this scenario, the flow from the Colchester Bay Development is directed to three individual outlets: Draper Street (11.33 L/s to MH015), Harrison Street (4.87 L/s to MH061), and Herring Avenue (13.02 L/s to MH072). The figure shows the capacity of the sewer network when operating under peak design flow conditions and most of the sewers were computed to have adequate capacity (shown in green). There are some sewers that had marginal capacity (shown in yellow); however, these are attributed to shallow sewer grades and are not anticipated to pose any issues to the overall effectiveness of the collection system.

5.3.2.3 Colchester Bay Phase 1 & 2 Analysis

Projected Wastewater Flows with the Colchester Bay Development Phase 1 & 2 (Single Outlet)

Figure 5.6 depicts the existing wastewater collection system and upgraded pumping stations (upgraded ultimate capacity) with the anticipated wastewater flows from the 'fully built out service area' plus the addition of the Colchester Bay Development Phase 1 and 2. In this scenario, the entire flow (44.46 L/s) for the Colchester Bay Development is all directed to a single outlet on Harrison Street (MH061). This figure shows that if the flow was directed to a single outlet some local sewers would exceed their design capacity (shown in red).

Projected Wastewater Flows with the Colchester Bay Development Phase 1 & 2 (Multi-Outlet)

Figure 5.7 depicts the existing wastewater collection system and upgraded pumping stations (upgraded ultimate capacity) with the anticipated wastewater flows from the 'fully built out service area' plus the addition of the Colchester Bay Development Phase 1 and 2. In this scenario, the flow from the Colchester Bay Development is directed to three individual outlets: Ogden Street (19.17 L/s to MH058), Prado Avenue (17.58 L/s to MH067), and Herring Avenue (13.02 L/s to MH072). The figure shows the capacity of the sewer network when operating under peak design flow conditions and most of the sewers were computed to have adequate capacity (shown in green). There are some sewers that had marginal capacity (shown in yellow and orange); however, these are attributed to shallow sewer grades and are not anticipated to pose any issues to the overall effectiveness of the collection system.

5.3.3 Recommended Upgrades

The existing trunk sewer which runs along Dunn Road and Adelaide Street (from its intersection with County Road 50 W onward to Pumping Station No. 5) has adequate capacity to accommodate the Colchester Bay Development. The local collector sewers including Dunn Road, Prado Avenue, Herring Avenue, Ferris Avenue, and/or Walnut Lane do not have adequate capacity to accommodate the entire flow from the development in a single sewer branch. Therefore, the flow from this development must be distributed between multiple existing sewer branches.

5.4 IMPACT ON EXISTING WASTEWATER TREATMENT FACILITY CAPACITY

5.4.1 Overview

This section of the report outlines the sewage servicing analysis and recommended upgrades for the Colchester South Wastewater Treatment Facility in order to accommodate the Colchester Bay Development. The sewage servicing analysis considers the 20-year population and flow projections within the existing service area as well as the expanded service area to include the Colchester Bay Development.

5.4.2 Sewage Servicing Analysis

Table 5.9 summarizes the historical operating data, 20-year sewage flow projections, and existing capacity of the Colchester South Wastewater Treatment Facility. The current historical average daily flow occupies approximately 57% of the rated capacity of **1,816 m^3/d**. The projected flows would exceed the rated capacity.

Table 5.9: Colchester South Sewage Works Historical and Projected Flow Summary

Colchester South Sewage Works	Average Daily Flow (m^3/d)	Peak Daily Flow (m^3/d)
Historical Raw Influent Sewage Flows (2015-2021)	1,032	3654
20-Year Projection (including Colchester Bay Phase 1)	3,080	15,542
20-Year Projection (including Colchester Bay Phase 1&2)	3,659	16,739
Existing Rated Capacity	**1,816**	**8,122**

5.4.3 Recommended Upgrades

The 20-year flow projection is well above the current rated capacity; therefore, a capacity upgrade to the existing wastewater treatment facility is required to service the Colchester South Community.

The exact commencement and completion dates for the proposed developments are not confirmed; therefore, a precise timeline for the Colchester South Wastewater Treatment Facility upgrades cannot be determined at this time. A number of the proposed developments outlined in **Table 5.1** would trigger an upgrade of the facility. Based on the historical operating conditions shown in **Table 2.13**, the average daily sewage flow (based on the 2021 data reviewed) was approximately 982 m^3/d, representing approximately 54 percent of the rated plant capacity (1,816 m^3/d). The most recent three-year annual average day flow (based on 2019 to 2021 data) is 1,062 m^3/d, representing approximately 58 percent of the rated plant capacity.

Therefore, any combination of developments that would contribute more than an additional 750 m^3/d to the average daily flow would trigger the need for an upgrade to the wastewater treatment facility. An additional average daily sewage flow of 750 m^3/d corresponds to an equivalent population of approximately 1,700 persons. With that being said, the completion of the Colchester Bay Development (Phase 1) on its own would trigger the need for an upgrade.

5.5 EFFLUENT OBJECTIVES AND NON-COMPLIANCE LIMITS

5.5.1 Existing Effluent Criteria

The treatment plant operates under Environmental Compliance Approval (ECA) No. 9096-7SFHHG issued May 28, 2009. **Table 5.10** summarizes the current ECA effluent objectives and non-compliance limits for the Colchester South Sewage Works.

Table 5.10: Existing Effluent Objectives and Compliance Limits

Parameter	Effluent Limits	Effluent Objectives
	Monthly Average Concentration	Concentration
cBOD5	25 mg/L	20 mg/L
TSS	30 mg/L	25 mg/L
TP	1.0 mg/L	0.8 mg/L

5.5.2 Proposed Effluent Criteria

An assimilative capacity study was completed on Lake Erie to evaluate the lake's ability to handle the projected future effluent flows and contaminant concentrations. A copy of this study is available in **Appendix C**. The new effluent limits are based on the 20-Year design flow of 3,600 m^3/d. Results from the study helped to guide the recommended effluent discharge criteria that were reviewed by the MECP for the upgraded Colchester South Sewage Works. On April 18th, 2023, Draft Assimilated Capacity Study was sent to the MECP for review. The MECP provided feedback on the Draft Assimilative Capacity Study on June 27th, 2023. A sensitivity analysis along with additional data was provided to the MECP on July 13th, 2023.

As of August 9th, 2023, the MECP has stated that the proposed effluent objectives and compliance limits are considered protective of the environmental and recommended for the ECA amendment for the proposed Colchester South Sewage Works Expansion. Consultation with the MECP is documented in **Appendix D**. The proposed effluent criteria reviewed by the MECP is provided in **Table 5.11.**

Table 5.11: Proposed Effluent Objectives and Compliance Limits

Parameter	Effluent Limits	Effluent Objectives
$CBOD_5$	15 mg/L	10 mg/L
TSS	15 mg/L	10 mg/L
Total Phosphorus	0.5 mg/L	0.4 mg/L
Total Ammonia (Nitrogen):		
Summer (May 1 to October 31)	1.5 mg/L	1 mg/L
Winter (Nov 1 to April 30)	3 mg/L	2 mg/L
E. coli (monthly geometric mean)	200 CFU/100 mL or 200 MPN / 100 mL	100 CFU/100 mL or 100 MPN / 100 mL
pH (grab sample)	6.5 - 8.5	6.5 - 8.5

As shown in **Table 5.10** and **Table 5.11**, the new discharge criteria are more stringent. particularly in terms of total phosphorous (TP) monthly average concentration, which was reduced from 1.0 mg/L to 0.5 mg/L with effluent objective of 0.4 mg/L. Email correspondence with the MECP regarding proposed effluent limits and objectives can be found in **Appendix D**.

The limits proposed are valid for the initial build out or an effluent daily average capacity of 3,600 m^3/day (42 L/s). These effluent limits should be verified and revised as needed upon introduction of additional plant capacity that increases effluent flow rates. Further monitoring of the receiving environment should be undertaken to support adoption of the effluent criteria proposed and to determine the need for any alterations to the criteria.

The wastewater treatment facility has continued to consistently achieve a high-quality effluent as shown in **Table 2.14**. Over the period reviewed, the plant achieves its effluent compliance requirements with concentrations of $CBOD_5$, TSS, and TP, which are even well below the effluent objectives. Therefore, the loading limits for the proposed expansion are anticipated to be in keeping with previously approved loading from the existing plant.

Provision shall be considered in the detailed design for future addition of tertiary treatment (i.e. filtration) in case that the expanded plant is required to meet more stringent effluent quality requirements than associated with secondary treatment, or the expanded plant cannot maintain the existing high effluent quality due to influent characteristics changes.

6.0 ALTERNATIVE WASTEWATER TREATMENT TECHNOLOGIES

The following sections presents the details of work undertaken as part of Phase 3 of the Class EA process. Phase 3 involves the identification of alternative design concepts (technical alternatives) for the preferred solution, and evaluation of various design concepts with the objective of determining which alternative best addresses the preferred solution. As such, the following sections describe alternative wastewater treatment technologies that might be considered for meeting the wastewater servicing demands in the Colchester South community.

The primary technical considerations when evaluating alternative treatment processes include the ability of a system to consistently meet the established effluent criteria, the feasibility of locating a suitable site for the process and of expanding the process to the ultimate capacity, the ability of the process to handle variations in hydraulic and organic loadings, requirements for sludge handling and disposal, and capital and operating costs. The following sections describe several wastewater treatment processes that might be considered for the Colchester South Sewage Works expansion.

The selection of a wastewater treatment technology and preliminary plant sizing will consider the current and projected future needs of the service area as outlined in **Section 5.1**. The preferred design will include consideration for two phases of expansion to the existing wastewater treatment facility. Expansion No. 1 will be designed to accommodate the servicing needs for the projected population and sewage flow in the next 20-years (20-Year Design). Expansion No. 2 will be designed to accommodate the servicing needs for the projected population and sewage flow beyond the next 20-years (Ultimate Design). Expansion No. 1 and/or 2 will also include consideration for increasing MECP effluent criteria. This will ensure reasonable effort is made to provide a financially responsible long-term solution that is neither redundant nor undersized.

6.1 INTRODUCTION

In this section of the report, alternative design concepts for the wastewater treatment technologies will be identified and evaluated leading to the selection of the recommended design. The following alternative technologies have been considered and will be outlined in the following sections:

Alternative No. 1: Aerated Lagoons
Alternative No. 2: Sequencing Batch Reactor (SBR)
Alternative No. 3: Activated Sludge Process (ASP)
Alternative No. 4: Membrane Biological Reactor (MBR)
Alternative No. 5: Moving Bed Biological Reactor (MBBR)

The five alternative solutions were evaluated based on a variety of social, natural environmental, economic, and technical criteria. These evaluation criteria were developed based on wastewater servicing needs at the wastewater treatment facility, applicable municipal plans / commitments, design principles, and past industrial experience. The evaluation criteria are as follows:

Technical Criteria:

- Ability to meet current and future wastewater servicing needs;
- Ability for logical and cost-effective plant expansion;
- Ability to meet effluent limits and objectives;
- Proven technology, proof of successful installations within Canada and Southwestern Ontario (similar climate) within the last 20 years;
- Constructability, implementation timeline, and phasing;
- Flexibility to meet future needs and/or climate change projections; and
- No adverse impacts on existing infrastructure (operations and/or maintenance).

Social Criteria:

- Impact to archaeological, built heritage, and cultural heritage;
- Noise, vibration, odour, or air pollution emissions;
- Permanent changes or impacts to society / community; and
- Development policies and agreements.

Natural Environmental Criteria:

- Impacts to vegetation, fish and wildlife, areas of natural and scientific interest, environmentally sensitive areas, and soil / geology;
- Regulatory compliances; and
- Development and planning policies.

Economic Criteria:

- Capital and O&M costs; and
- Lifecycle cost.

The advantages and disadvantages of each alternative together with their effects on the socioeconomic and natural environment are discussed in the following sections.

6.2 DESCRIPTION OF ALTERNATIVE WASTEWATER TREATMENT TECHNOLOGIES

6.2.1 Alternative No. 1: Aerated Lagoon

The aerated lagoon is the treatment process currently used at the Colchester South Sewage Works. It is a simple wastewater treatment system consisting of large pond(s) with mechanical or diffused aeration to promote mixing and biological oxidation of wastewater. The population of microorganisms in an aerated lagoon is initially much lower than that in an ASP because there is no sludge recycle. A longer residence time is required to achieve the same effluent quality as ASP. Microorganisms in aerated lagoons are more resistant to process upsets caused by feed variations than those in ASP because of the larger tank volumes

and longer residence times used. Unlike the ASP, settling tanks and sludge recirculation arrangements are absent in aerated lagoons.

6.2.2 Alternative No. 2: Sequencing Batch Reactor (SBR)

Sequencing batch reactors are a type of activated sludge process for the treatment of wastewater. The raw wastewater flows directly into the aeration tank. While in the aeration tank, the wastewater is aerated over a number of "air-on/air-off" cycles. The solids-liquid separation (i.e. final clarification) occurs during the air-off part of the cycle. During the latter part of the air-off cycle, treated effluent is decanted or withdrawn from the liquid surface. The SBR process can maintain a continuous wastewater inflow allowing flow equalization, biological oxidation, nitrification, and final clarification to be carried out in one tank.

6.2.3 Alternative No. 3: Activated Sludge Process (ASP)

In the activated sludge process, an environment is created where micro-organisms (activated sludge) can oxidize organic matter in the wastewater under controlled aerobic conditions. The process normally occurs in a tank (aeration tank) in which air is introduced to mix the contents and provide a source of oxygen for the micro-organisms. The micro-organisms consume the organic matter in the wastewater and in so doing produce new cell mass. The micro-organisms and the wastewater are mixed for a period of time after which the mixture of new and old cells flows to a settling tank where the micro-organisms are settled and separated from the treated wastewater. A portion of the settled micro-organisms is re-cycled back to the aeration tank (return activated sludge) to maintain a desired concentration of micro-organisms and a portion of the settled sludge is wasted for disposal.

6.2.4 Alternative No. 4: Membrane Biological Reactor (MBR)

Membrane Biological Reactors (MBR) are suspended growth activated sludge treatment processes in which bacteria are grown in a suspension of wastewater and oxygen. The MBR process combines the unit operations of aeration, secondary clarification, and tertiary filtration into a single process. It is similar to the ASP except the solids/liquid separation is achieved through the use of immersed ultra-filtration membranes that operate under vacuum pressure rather than a settling tank. The MBR represents the current state of the art for wastewater treatment and is finding niche applications where space is limited, where stringent effluent limits must be met, and/or where retrofits of existing facilities is proving cost competitive with more traditional expansions.

6.2.5 Alternative No. 5: Moving Bed Biological Reactor (MBBR)

Moving Bed Biological Reactors (MBBR) are highly effective biological wastewater treatment processes made up of biofilm media and conventional activated sludge processes allowing wastewater to be treated in both anaerobic and aerobic environments. The MBBR tank contains media that may occupy as much as 50 to 70% of the tank, which provides surface area for biofilm to grow on them. An aeration grid located at the bottom of the reactor tank keep the media moving to efficiently decompose waste and introduce more oxygen into the tank. The microorganisms attached to the media in the tank consume waste in the wastewater, leaving it cleaner and safer.

6.3 EVALUATION OF ALTERNATIVE WASTEWATER TREATMENT TECHNOLOGIES

In order to objectively compare the alternatives, an evaluation matrix with a colour rating scale system was utilized. The colour rating scale is the same as that used in **Section 4.3** and the descriptions presented in **Table 4.1**. The evaluation of alternative design solutions is presented in **Table 6.1**.

Table 6.1: Evaluation of Treatment Process Alternatives

	Aerated Lagoons	SBR	ASP	MBR	MBBR
Technically Suitability	Poor • Simple O&M • Additional treatment required to meet effluent criteria • Simple constructability • Complex expansion requirements • Periodic sludge extraction is a major operation • Sensitive to cold climate	Great • Complex O&M • No external clarification required to meet effluent criteria • Simple constructability • Simpler expansion requirements • Adaptable to varied flows • Familiar to Essex operators	Fair • Complex O&M • External clarification required to meet TSS effluent criteria • Moderate constructability • Simpler expansion requirements • Proven and common treatment technology for large flow facilities	Fair • Most complex O&M • Pre-treatment required to meet effluent criteria • Simple constructability • Simpler expansion requirements • Performance relies heavily on maintenance	Good • Complex O&M • External clarification required to meet TSS effluent criteria • Simple constructability • Simpler expansion requirements • Adaptable to varied flows • Resistance to cold climate
Social (1)	Poor • Large footprint • Higher odour potential	Good • Moderate footprint • Lower odour potential	Good • Moderate footprint • Lower odour potential	Great • Small footprint • Lower odour potential	Good • Small-Moderate footprint • Lower odour potential
Natural Environment (1)	Fair • Moderate effluent quality	Great • Good effluent quality	Good • Good effluent quality	Great • Good effluent quality	Fair • Moderate effluent quality

Table 6.1: Evaluation of Treatment Process Alternatives

	Aerated Lagoons	SBR	ASP	MBR	MBBR
Economic	Great • Low O&M cost • Low capital cost • Sludge extraction is costly • Requires aeration system	Good • Moderate O&M cost • Moderate capital cost • Savings on civil work • Requires high efficiency aeration system	Fair • Moderate O&M cost • High capital cost • Requires high efficiency aeration system	Poor • High O&M cost • High capital cost • Requires high efficiency aeration system	Fair • Moderate O&M cost • High capital cost • Requires aeration system
Overall	**Fair**	**Great**	**Fair**	**Good**	**Good**

Note:
(1) All alternatives to be designed in accordance with the MECP Environmental Noise and Vibration Guidelines, which will ensure the appropriate engineering control measures are in place.

6.4 RECOMMENDED WASTEWATER TREATMENT TECHNOLOGY

Table 6.1 provides an evaluation of the five (5) alternative wastewater treatment processes to treat raw sewage flow from the expanded Colchester South service area. Based on the evaluation, Alternative No. 2 – Sequencing Batch Reactor was identified as the preferred treatment process because it is proven to generate good effluent quality within a moderate footprint at a moderate capital and O&M cost.

In terms of the technical suitability, SBR is considered to be moderately complex to operate and maintain. However, there is some potential for process automation and remote-control operation which would improve the ease of O&M. SBR is the only alternative which is expected to meet MECP effluent criteria without the use of pretreatment or external clarification resulting in relatively simple constructability and expansion. Further, SBR is more adaptable to variations in influent flow. In addition, this technology is consistent with that used at the nearby Essex Pollution Control Plant. This is beneficial as the Ontario Clean Water Agency (OCWA) operates both facilities and will be familiar with the operations and maintenance requirements of this technology.

In terms of the impact on the social and natural environment, the SBR is expected to occupy a moderate footprint. This treatment technology would have a low potential for odour, noise, and vibrations which will allow the facility to meet MECP Design Guidelines for offsite emissions. Further, this treatment technology would produce acceptable effluent quality reducing potential impacts to the aquatic life in Lake Erie. Generally speaking, the facility will be designed in accordance with the MECP Design Guidelines for Sewage Works with appropriate engineering control measures in place to mitigate permanent impacts to the community and natural environment. In addition, the preferred design shall be situated in compliance with Guideline D-2 from the MECP Design Guidelines for Sewage Works with adequate separation distance from sensitive land uses to mitigate odour and provide for adequate attenuation for noise and vibrations associated with plant operation. These requirements are further discussed in **Section 9.4.2.**

In terms of economic requirements, SBR is expected to have a moderate O&M cost with moderate capital cost investment.

7.0 ALTERNATIVE BIOSOLIDS MANAGEMENT STRATEGIES

The following sections presents the details of work undertaken as part of Phase 3 of the Class EA process. Phase 3 involves the identification of alternative design concepts (technical alternatives) for the preferred solution, and evaluation of various design concepts with the objective of determining which alternative best addresses the preferred solution. As such, the following sections describe alternative biosolids management strategies that might be considered for meeting the demands in the Colchester South community.

7.1 INTRODUCTION

Biological wastewater treatment processes produce excess solids known as waste activated sludge. Biosolids management deals with all aspects of handling the waste sludge stream including stabilization, dewatering or thickening, and ultimate disposal. This section of the report reviews various biosolids management approaches with the objective of selecting the preferred biosolids management strategy for the upgraded Colchester South Wastewater Treatment Facility.

As a matter of interest, the terms sludge and biosolids are often used interchangeably, although the term biosolids is more commonly used to describe sludge that has undergone treatment to render it suitable for land application.

7.2 ESTIMATED SLUDGE PRODUCTION

The MECP Guidelines provide information on typical sludge generation rates and characteristics for various treatment processes. Typical sludge production values for the SBR process with phosphorus removal are listed as follows:

Liquid Sludge	– 13.3 L/m^3 of treated sewage
Solids Concentration	– Range 0.4% to 1.9%
	– Average 0.9%
Volatile Solids Content	– 60%
Dry Solids	– 120 grams per cubic meter of sewage treated or
	55 grams per capita per day

Table 7.1 summarizes the estimated future sludge production values at the rated capacity of the plant. Based on the standard production rate of 120 g TS/m^3 raw sewage treated, the future average daily sludge production was estimated at 444 kg/d and 900 kg/d for the 20 year and ultimate design, respectively. The maximum monthly sludge production values were based on the 2018 peak factors.

Table 7.1 Estimated Future Sludge Production

Parameter	20 Year Design		Ultimate Design	
	Average Day	Max. Month	Average Day	Max. Month
Flow (m^3/d)	3,700	16,800	7,500	32,800
Dry Solids Production (kg/d)	444	2,016	900	2,936
Volume of Liquid Sludge at 0.9 % Solids (m^3/d)	49	223	100	436

7.3 BIOSOLIDS MANAGEMENT PROCESSES

In this section of the report, alternative biosolids management processes are identified and screened leading to the selection of various alternative biosolids management strategies that will be further reviewed in **Section 7.4**. Generally speaking, biosolids management strategies for wastewater treatment facilities will include some combination of the following four processes: (1) thickening, (2) stabilization, (3) dewatering, and (4) disposal. Of these four processes, ultimate disposal is a required step of the biosolids management strategy while dewatering, thickening, and/or stabilization are optional.

7.3.1 Sludge Thickening

Sludge thickening increases the solids concentration of sludge by removing a portion of the liquid content thereby reducing its volume. This may result in smaller footprint or trucking requirements for downstream processes (digesters or storage tanks) and lower energy requirements for mixing and/or aeration operations. Several sludge thickening options were analyzed based on performance, operating cost and design parameters, and applicability. These options include gravity thickening (GT), gravity belt thickeners (GBT), and rotary drum thickeners (RDT).

7.3.1.1 Gravity Thickening with Polymer Addition

Gravity thickening is similar to sedimentation in a conventional clarifier. Dilute sludge is dosed with polymer and fed to a central well in a gravity thickening tank where it is allowed to settle and compact. Supernatant is drawn off the top and thickened sludge is pumped from the bottom of the unit. Gravity thickening is capable of achieving concentrations of 2 to 4% for both raw and digested waste activated sludge (WAS). This process has relatively low operations and power requirements; however, this simple process also results in lower solids capture and higher odour potential.

7.3.1.2 Gravity Belt Thickeners

With gravity belt thickeners, polymer conditioned sludge is distributed evenly across the width of a moving fabric belt. Free water drains through the belt, while suspended solids are retained on the surface. Rows of plough blades ride on the belt surface and turn the sludge to release additional water and expose clear areas on the belt for improved drainage. A high-pressure wash is used to clean polymer and suspended solids from the pores of the fabric belt. Filtrate is collected and returned to the head of the plant, or to the

secondary treatment plant. A sludge concentration of 4 to 9 percent can be achieved when thickening raw WAS, and 4 to 6 percent when thickening digested WAS.

7.3.1.3 Rotating Drum Thickeners

With rotating drum thickeners, polymer conditioned sludge is fed into one end and is distributed onto the internal surface of a rotating drum screen. Flocculated sludge solids are retained on the inner surface, while free water drains through the screen. Filtrate is collected in a trough and is returned to the head of the plant, or to the secondary plant. Sludge solids are conveyed towards the outlet end of the drum by flights or an internal screw conveyor. The inside and outside drum surfaces are periodically rinsed to flush trapped solids from the screen. As with GBT, sludge concentrations of 4 to 9 percent can be achieved when thickening raw WAS, and 4 to 6 percent when thickening digested WAS.

7.3.1.4 Comparison of Sludge Thickening Options

Table 7.2 summarizes the advantages and disadvantages of the thickening processes.

Table 7.2 Advantages and Disadvantages of Sludge Thickening Processes

Process	Advantages	Disadvantages
Gravity Thickening (GT)	• Simple operation • Low power requirements	• Lower solids capture • Potential for rising sludge and/or sludge to turn septic due to long HRT • Odour potential • Polymer is required for effective operation • Susceptible to filamentous sludge
Gravity Belt Thickener (GBT)	• Low space requirements • Low power requirements • High solids capture • High operating flexibility • Low maintenance requirement	• Polymer is required for effective operation • Odour potential • Higher operation requirements
Rotating Drum Thickener (RDT)	• Low space requirements • Low power requirements • High solids capture • High operating flexibility • Low maintenance requirement • Lower odour potential due to ease of enclosure	• Polymer is required for effective operation • Higher operation requirements

Other technologies that are used for thickening include centrifugation, dissolved air flotation, vacuum filtration, and plate press thickeners that are not considered further in this study. Reasons for not considering these options are outlined below in **Table 7.3.**

Table 7.3 Sludge Thickening Technologies Not Considered for Application

Thickening Technology	Description of Negative Screening Result
Centrifugation	Very high capital cost relative to considered technologies. More suitable for larger facilities.
Dissolved Air Flotation	High operational requirements. Poor performance with variable sludge characteristics.
Vacuum Filtration	Not commonly used.
Plate Press Thickener	More commonly used in industrial applications than municipal applications. Not typically a cost-effective alternative for smaller municipal WWTPs.

The main benefit of sludge thickening is reducing the total volume of sludge that would need to be stored onsite prior to further treatment or disposal. However, the Colchester South Wastewater Treatment Facility is relatively small and based on the anticipated biosolids production sludge thickening is not considered a requirement at this time.

7.3.2 Stabilization

Sludge stabilization is a process used for pathogens reduction for reuse and land application (disposal) as well as total volume reduction. This may result in smaller footprint or trucking requirements for downstream processes (digesters or storage tanks) and is required if disposal at landfill is desired. Several sludge stabilization options were analyzed based on performance, operating cost and design parameters, and applicability. There are a number of potential sludge stabilization alternatives available including anaerobic digestion, aerobic digestion, incineration, composting, and pelletization.

In addition to the processes described below, alkaline stabilization is a process that could potentially be used at the new treatment facility to condition sludge for application on farmland. However, negative factors associated with alkaline stabilization include high odour potential and difficulties associated with storage of dewatered, lime stabilized, sludge cake. Alkaline stabilization is not in broad use in Ontario at this time; therefore, it is not recommended for this application.

7.3.2.1 Anaerobic Digestion

Anaerobic digestion is a solids stabilization process which utilizes microorganisms to decompose organic materials while simultaneously reducing odours and pathogens from the solids stream. This process significantly decreases the volume of biosolids material. The most common digester type for this application is mesophilic anaerobic digesters (MADs) and alternative technologies include thermophilic anaerobic digesters, temperature-phased anaerobic digestion, acid/gas phased digestion, and egg-shaped anaerobic digesters. Anaerobic digestion is a biological process which includes four stages: (i) hydrolysis, (ii) acidogenesis, (iii) acetogenesis, and (iv) methanogenesis. In the first stage, hydrolysis, complex organic matter is hydrolyzed to simpler soluble organic compounds. In the subsequent step, acidogenesis, these soluble organic compounds are then fermented to volatile fatty acids (VFAs).

In the next step, acetogenesis, VFAs are converted to acetic acid, carbon dioxide, and hydrogen. In the last step, methanogenesis, methanogens convert acetic acid, carbon dioxide, and hydrogen to biogas consisting mainly of methane, carbon dioxide, and some impurities. In this biological process, hydrolysis is considered the rate limiting step.

The gas produced from the anaerobic digesters is a form of renewable energy resource commonly referred to as 'biogas' which can be used as a source for the production of heat, electricity, and/or fuel. The quantity and quality of the biogas production at a facility is directly related to the quantity and quality of feedstock materials (sludge characteristics) as well as the operating conditions of the digester. Alternative biogas-to-energy technologies or biogas utilization strategies include: (1) generation of heat for onsite use; (2) onsite co-generation of combined heat and power (CHP) via reciprocating engines; (3) upgrade to renewable compressed natural gas (R-CNG) and utilize as an alternative fuel in fleet vehicles; and (4) upgrade to renewable natural gas (RNG) and inject to natural gas pipeline.

The anaerobic digestion process results in the production of biosolids in the form of digestate. The digestate would be dewatered and stored onsite or offsite prior to agricultural land application. The size of this storage would need to be adequate for storage during the winter months. Alternatively, pretreatment technologies or post-treatment may be utilized to reduce the volume of and upgrade the quality of the biosolids. This is a highly capital-intensive stabilization process which is typically employed for large municipalities or on a regional level.

7.3.2.2 Aerobic Digestion

Aerobic digestion is a solids stabilization process which utilizes microorganisms in the presence of oxygen to decompose organic materials while simultaneously reducing odours and pathogens from the solids stream. This process can also be utilized to reduce the volume of sludge. Aerobic digestion may be run as a continuous operation or in batches with one or more digestions tanks operating in sequence. Under aerobic conditions organic matter is converted to carbon dioxide and water resulting in an approximately 50 % reduction in solids content. Oxygen is introduced into the digesters through fine bubble aerators which also serve to mix the contents. In general, aerobic digestion has relatively simple construction, operation, and maintenance requirements due to the simplicity of the open tank system operating at ambient temperature. Although the system is open to the air, it does not represent a significant source of offsite noise, odour, or vibrations. One major disadvantage of anaerobic digestion is the requirement for and operating cost associated with the aeration systems.

The aerobic digestion process results in the production of biosolids in the form of digestate. The digestate would be dewatered and stored onsite or offsite prior to agricultural land application. The size of this storage would need to be adequate for storage during the winter months. Alternatively, pretreatment technologies or post-treatment may be utilized to reduce the volume of and upgrade the quality of the biosolids. Aerobic digestion has been used in Ontario for the stabilization of sludge from treatment plants which do not have primary sedimentation tanks making it suitable for smaller plants.

7.3.2.3 Incineration

Incineration is a type of thermal treatment technology which may be used to treat municipal wastewater sludge. The industry standard and most commonly applied technology for incineration of municipal sludge are fluidized bed incinerators with comprehensive air pollution control measures. At these facilities, wastewater sludge is burned in a combustion chamber to recover excess energy in the form of heat and/or electricity. Fluidized bed incinerators employ a fluidized bed of granular material at a minimum temperature of 850°C to transfer heat directly to the sludge. Energy from the incineration occurring in the combustion chamber is converted into steam and further into electricity by use of a turbine generator. The electricity recovered from this process can be used to power the incineration facility or sold to the provincial electrical grid. With the exception of the initial start-up period, the process does not require the input of additional heat or energy. Incineration facilities have the capability to reduce the volume of solid waste by up to 90%. Following combustion, propellers remove the remaining materials from the chamber where they are further separated for material reuse. The granular bed material is separated via sieves and returned to the combustion chamber and metals are removed via magnets to be recycled. The remaining material, ash, is collected, stored, and reutilized or landfilled offsite. There is potential for a portion of the ash material to be beneficially reused to offset raw inputs in cement manufacturing, gypsum material production or other similar industrial applications as available in the region. The incineration facility would provide short-term storage of ash and that which is not reused would be periodically trucked to landfill. This is a highly capital-intensive stabilization process which is not typically used in Ontario.

7.3.2.4 Composting

Composting is a solids stabilization process which biologically decomposes organic material and destroys pathogens from the solids stream. This process results in a stabilized compost product that can be used as mulch, soil conditioner, or a soil amendment depending on the incoming material. The industry standard for composting municipal sludge is enclosed negatively aerated static pile composting which is a well proven and successful technology used throughout Canada. This technology is beneficial as the final product is a Class A fertilizer which can be effectively stored during winter months and sold for revenue.

At these facilities dewatered sludge is mixed with a bulking agent such as wood chips, municipal solid waste, or source-separated organics (SSO) waste prior to composting. This mixed composting material is formed into freestanding piles on top of perforated piping or stored in three-walled bunkers that are lined with perforated piping. These piping systems are connected to a blower that push (positive aeration) or pull (negative aeration) air through the pile and control the decomposition process. The use of negative aeration is advantageous as biofilters can be installed in the blower assembly to treat the process air, remove particulate, and eliminate odours prior to venting. The perforated aeration pipes are covered with a layer of wood chips to facilitate air distribution, absorb moisture, and ensure uniform aeration. In addition, a layer of wood chips or recycled compost is used to cover the pile for insulation and improved odour control. The active composting period is typically 3 to 4 weeks and is followed by a curing period of approximately 4 to 12 weeks. Following the active composting period, material is removed from their existing piles and reformed into curing piles, typically located outdoors. The curing period is essential to further dry, stabilize, and deodorize the material prior to screening and final storage. This is a highly land and capital-intensive stabilization process which is typically employed for large municipalities or on a regional level.

7.3.2.5 Pelletization

Pelletization is a solids stabilization process which involves drying and pelletizing sludge to remove moisture, stabilize the sludge, destroy pathogens, and produce a fertilizer which may be sold. Typically, dewatered sludge cake is transported from the wastewater treatment plant to a pelletization facility. The dewatered sludge cake is temporarily stored in a sludge receiving bin/tank, which is equipped with an adsorption odor control system. From the sludge holding tank, sludge is moved into a mixer where it is mixed with dried recycled product to form a homogenous feed material. This homogenized mixture allows for improved management and conveyance of materials through the dryer system. Pelletization facilities commonly use thermal drying processes to dry sludge, pasteurizes it, and eliminates pathogens, while maintaining the nutrient and organic benefits in the final product. The dried and screened product is moved inro silos where the fertilizer is stored prior to being shipped to customers. This is a highly energy and capital-intensive stabilization process which is typically employed for large municipalities or on a regional level.

7.3.2.6 Comparison of Sludge Stabilization

Table 7.4 summarizes the advantages and disadvantages of the stabilization processes.

Table 7.4 Alternative Methods of Biosolids Stabilization

Stabilization Process	Advantages / Disadvantages
Anaerobic Digestion (ultimate disposal by landfilling or farmland application)	• Well stabilized end product suitable for farmland application • Very expensive and complex system for low design capacity • Small footprint requirements • Not commonly used at small plants • Easily phased/expanded to meet future needs • Low odour potential • Potential for high energy efficiency due to renewable heat/power from biogas utilization • High capital costs • More suitable for regional biosolids management plans • Not viable for this size of application
Aerobic Digestion (ultimate disposal by landfilling or farmland application)	• Well stabilized end product suitable for farmland application • Simple operation and maintenance requirements • Small footprint requirements • Commonly used at small plants • Easily phased/expanded to meet future needs • Low odor potential • Energy intensive • Moderate capital cost • Viable for this size of application

Incineration (Disposal at landfill, and beneficial reuse)	• No incinerators in close proximity within Essex County or Chatham-Kent County • Prohibitive capital cost • Prohibitive permitting requirements for new incineration facility • Not viable for this application
Composting (Disposal includes landfill, farmland application and possibly re-sale or giveaway)	• Well stabilized end product suitable for farmland application • Potential for resource/nutrient recovery and beneficial reuse • Extensive treatment requirement and compost guidelines • Potential market for sale and/or giveaway • Complex operation and maintenance requirements • Large footprint requirements • Not commonly used at small plants • Difficult to phase/expand to meet future needs • High odor potential • Difficult to store cured and/or finished product in an odour free form leading to potential for vermin and vectors • Energy Intensive • High capital cost • More suitable for regional biosolids management plans • Not viable for this size of application
Pelletization (ultimate disposal alternatives include landfill, farmlands and possibly sale as fertilizer additive)	• Well stabilized end product suitable for farmland application • Potential for resource/nutrient recovery and beneficial reuse • Requires strict quality control for sale purposes • Potential market for sale • Very significant volume reduction • Suitable for long term storage and easy handling • Complex operation and maintenance requirements • Not commonly used at small plants • Difficult to phase/expand to meet future needs • Low odor potential • Energy Intensive • High capital costs • More suitable for regional biosolids management plans • Not viable for this size of application

Considering the anticipated quantity of biosolids production at the Colchester South Wastewater Treatment Facility, it is evident that aerobic digestion for sludge stabilization is the most preferred alternative. For the Colchester South Wastewater Treatment Facility, the use of an aerated sludge holding tank would be suitable to stabilize sludge, mitigate sludge odour potential, and reduce sludge storage volume. This process is simple to operate and maintain and is commonly applied at small wastewater treatment facilities. Although, this sludge stabilization process is energy intensive and comes at a moderate capital cost it is considered a beneficial addition to the wastewater treatment facility. Land application is not being considered at this time; however, the aerated sludge holding tanks can be designed with a sufficient solids retention time to allow for land application in the future.

7.3.3 Dewatering

Similarly to sludge thickening, sludge dewatering increases the solids concentration of sludge by removing a portion of the liquid content thereby reducing its volume. Sludge dewatering differs from sludge thickening in that it removes a greater quantity of water from the sludge (typically to a dry solids content of approximately 15 – 30 % with centrifuging). This may result in smaller footprint or trucking requirements for downstream processes. Based on the application of biosolids stabilization via aerobic digestion dewatering would be beneficial to improve the quality and marketability of the final biosolids product. Several dewatering options were analyzed based on performance, operating cost and design parameters, and applicability. For biosolids dewatering there are four major technologies that include belt presses, rotary presses, screw presses, and centrifuges.

7.3.3.1 Belt Filter Presses

Belt filter presses are a technology used to dewater solids by applying two or three belts and a series of rollers to mechanically separate the solids and liquids portions of the liquid sludge. Compression and gravity drainage are both used to separate the water leaving the solids portion. Typically, liquid sludge or pre-conditioned sludge enters the gravity drainage section. Most of the free water is removed by the gravity drainage section. The biosolids are then introduced into a low-pressure section where they are squeezed between two porous cloth belts. In most modern units, the low-pressure section is following by a high-pressure section where the biosolids are subjected to compression forces as belts pass through a series of rollers. The belts are continually washed.

7.3.3.2 Rotary Presses

Rotary presses are relatively new technology for dewatering purposes. Their performance on solids capture rate and cake solids content are similar to centrifuges and belt presses. Rotary presses separate water from solids by gravity, friction, and pressure differential. Conditioned biosolids are fed into a channel bound by screens on each side. The channel curves with the circumference of the unit, making a 180-degree turn from the inlet to the outlet of the rotary press. The solids move in a continuous, slow, concentric motion through the unit, while free water passes through the screens. The dewatered cake is continuously released through the pressure-controlled outlet.

7.3.3.3 Screw Presses

A screw press is a simple, slow-moving device that achieves continuous dewatering. Dewatering screw presses are divided into two major categories: inclined and horizontal. The inclined screw presses are at angles 15 to 20 degrees from the horizontal. A screw press is an enclosed cylindrical unit with a rotating screw. The screw transfers the conditioned biosolids through the wedge wire screening basket while the filtrate passes through the bottom and sides of the wedge wire screen. Screw presses dewater solids first by gravity drainage at the inlet section of the screw and then by squeezing free water out of the solids as they are conveyed to the discharge end of the screw under gradually increasing pressure and friction.

7.3.3.4 Dewatering Centrifuges

Centrifuges are widely used for biosolids dewatering and are relatively simple to operate. Cake dryness and centrate quality can be controlled by changing the conveyor torque and polymer dosage. Centrifuges require less operator attention and can produce sludge cake with high solids content.

7.3.3.5 Comparison of Sludge Dewatering

Table 7.5 summarizes the advantages and disadvantages of the dewatering processes.

Table 7.5 Advantages and Disadvantages of Sludge Dewatering Processes

Process	Advantages	Disadvantages
Belt Filter Presses	• Low energy consumption • Straight forward operation • Moderate capital and O&M costs	• Significant housekeeping requirements • Higher potential for odours • Variable efficiency • High water consumption for belt washing, resulting in high volumes of filtrate returned for re-treatment • Produces aerosol in work area • More operator attention required
Rotary Presses	• Totally Enclosed – Odours Contained • Small Footprint • Low Noise and Vibration Levels • Uses Less Energy Than Belt Presses and Centrifuges	• Screen Clogging Potential • Relatively High Capital Cost • Limited Performance with Secondary Solids • Low Throughput Compared to Other Mechanical Dewatering Processes
Screw Presses	• Low Energy Consumption • Containment of Odours and Aerosols • Simple Operation and Low Operator Attention • Low Maintenance and Noise	• Requires Continuous Wash Water (Lower Requirement Than Belt Filter Press) • Low Solids Content with No Primary Sludge • Low Solids Capture Rate • Larger Footprint Requirements
Dewatering Centrifuges	• Less operator attention • Easy to automate • Dry cake and high solids content • Self-contained process, which minimizes housekeeping and odour potential • Operation staff are typically familiar with this type of equipment • Control capability to improve process performance by adjusting equipment set points • Widely used at large WWTPs	• Energy intensive • Major maintenance occurs offsite • Support structures need to be designed to handle vibrations

Based on the advantages and disadvantages, the application of dewatering centrifuges is considered a preferrable option for the Colchester South Wastewater Treatment Facility. The application of a dewatering

centrifuge would require less operator attention as it is easier to automate. In addition, this process will allow for a high-quality dewatered sludge cake with high solids content. This process would be self-contained within a building equipped with odour control units resulting in minimal housekeeping requirement and low offsite odour potential. Operation staff are typically familiar with dewatering centrifuges, and these are widely used at WWTPs throughout Ontario which will allow for easier operations and maintenance. The application of centrifuge dewatering will be further explored as a part of the biosolids management strategy in the **Section 7.4**.

7.3.4 Biosolids Disposal

There are a number of potential biosolids disposal alternatives available. **Table 7.6** provides a summary of several different biosolids disposal options including re-sale or giveaway, landfilling, and farmland application.

Table 7.6: Alternative Methods of Biosolids Disposal

Biosolids Disposal	Advantages / Disadvantages
Re-Sale or Giveaway	• Nutrient recovery and beneficial reuse • May generate revenue to offset operating costs • Requires a significant market demand • Requires extensive processing and quality control • Stabilization of biosolids for pathogen reduction necessary • Requires extensive permitting • High capital cost • Very expensive and complex system for low design capacity
Landfilling	• No nutrient recovery or beneficial reuse • Ongoing requirement for dewatering, haulage and tipping fees • No requirements for marketability • Independent of farm operation or weather • No requirement for extensive processing • Requires dewatering facilities to reduce leachate forming potential and improve manageability at landfill • Permitting in place for existing Essex PCP • Minimal capital cost • Cost effective and less complex system suitable for this application
Farmland Application	• Nutrient recovery and beneficial reuse • May generate revenue to offset operating costs • Requires a significant market demand • Farm operations and weather dictate frequency of disposal • Requires extensive processing and quality control • Stabilization of biosolids for pathogen reduction necessary • Infrequent disposal introduces requirement for extensive liquid biosolids storage or biosolids dewatering and sludge cake storage facilities • Requires extensive permitting • High capital cost • Very expensive and complex system for low design capacity

The ultimate disposal method that is best suited for use at the Colchester South Wastewater Treatment Facility would be disposal by landfilling. This is a relatively low-cost option that is a proven process successfully used for biosolids disposal at the nearby Essex PCP. Therefore, disposal by landfilling is recommended at this time. In the future or when major process upgrades are required, stabilization of liquid sludge via aerobic digestion followed by dewatering will result in a marketable biosolids product which can be land applied.

7.4 EVALUATION OF BIOSOLIDS MANAGEMENT STRATEGIES

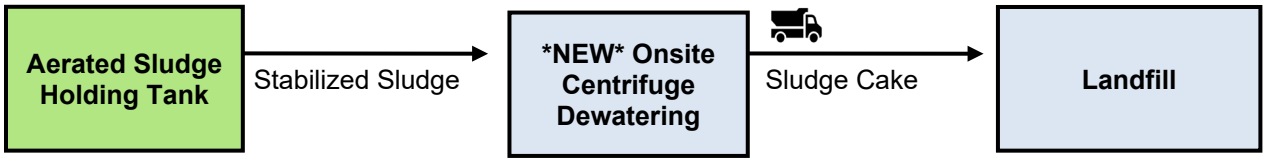
In this section of the report, alternative design concepts for the biosolids management strategies will be identified and evaluated leading to the selection of the recommended design. The following alternative strategies have been considered and will be outlined in the following sections:

Alternative No. 1: Dewatering Onsite and Disposal
Alternative No. 2: Dewatering at Essex PCP and Disposal

The two alternative solutions were developed based on the preferred biosolids management processes, centrifuge dewatering and landfill disposal, which were identified in **Section 7.3**. The biosolids management strategies were evaluated in terms of a variety of social, natural environmental, economic, and technical criteria. These evaluation criteria were developed based on wastewater servicing needs at the wastewater treatment facility, applicable municipal plans / commitments, design principles, and past industrial experience. The evaluation criteria are the same as those listed for the evaluation of alternative wastewater treatment technologies.

7.4.1 Alternative No. 1: Dewatering Onsite and Disposal

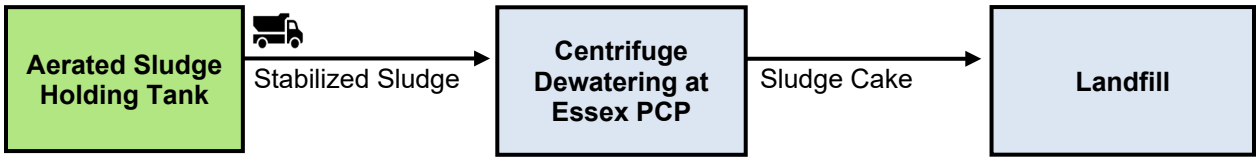
Under this strategy, liquid sludge from the SBR process will be removed and temporarily stored onsite in an aerated sludge holding tank. Periodically the sludge would be transferred to a new dewatering facility, to be constructed onsite, which employs dewatering centrifuges. This strategy would require the design, construction, and operation of an onsite dewatering facility at the Colchester South Wastewater Treatment Facility. The dewatered sludge would then be disposed of at landfill. The following is a simple schematic of the proposed biosolids management strategy:



The main benefit of this biosolids management strategy is that it is a self-contained process which can be completely controlled at the Colchester South Wastewater Treatment Facility. A dewatering facility does not represent a significant source of offsite odour, noise, or vibration. Application of dewatering onsite would result in a reduced volume of sludge for disposal and less frequent trucking requirements. This would be a viable long-term solution for biosolids management; however, it would come at a significant capital cost to the Town of Essex and increase operations and maintenance requirements at the facility.

7.4.2 Alternative No. 2: Dewatering at Essex PCP and Disposal

Under this strategy, liquid sludge from the SBR process will be removed and temporarily stored in an aerated sludge holding tank. Periodically the sludge would be transferred by truck to the existing dewatering facility at the Essex PCP. The dewatered sludge would then be disposed of by landfilling. The following is a simple schematic of the proposed biosolids management strategy:



The main benefit of this biosolids management strategy is that it has a lower capital, operations, and maintenance cost with minimal to no construction requirements. This strategy would not require the design, construction, and operation of an onsite dewatering facility at the Colchester South Wastewater Treatment Facility. The capacity of the Essex PCP appears to be sufficient to accept addition sludge from the Colchester Facility. This strategy would allow for a smaller footprint with low potential for offsite odour, noise, and vibration. The main disadvantage of this management strategy is that the sludge will not be dewatered prior to trucking which would result in more frequent truck loads to the Essex PCP.

7.4.3 Evaluation of Alternatives

In order to objectively compare the alternatives, an evaluation matrix with a colour rating scale system was utilized. The colour rating scale is the same as that used in **Section 4.3** and the descriptions presented in **Table 4.1**. The evaluation of alternative design solutions is presented in **Table 7.7**.

Table 7.7: Evaluation of Alternative Biosolids Management Strategies

Evaluation Criteria	Alternative No. 1: Dewatering Onsite and Disposal	Alternative No. 2: Dewatering at Essex PCP and Disposal
Technical Suitability	Fair • More complex O&M requirements • Construction required • Volume is reduced prior to trucking resulting in less frequent loads to the landfill	Good • Less complex O&M requirements • Construction not required • Volume is not reduced prior to trucking resulting in more frequent loads to the Essex PCP

		• Capacity at the Essex PCP appears to be sufficient to accept additional sludge from the Colchester WWTP
Social	Fair • Higher footprint required for the Colchester WWTP • Less frequent truck loads • Minimal odour potential • Minimal noise and vibration potential	Good • Minimal footprint required at the Colchester WWTP • More frequent truck loads • Minimal odour potential • Negligible noise and vibration potential
Natural Environment	Good • Less frequent truck loads	Fair • More frequent truck loads
Economic	Poor • High O&M costs at the Colchester WWTP • Low O&M cost related to trucking • High capital cost	Great • Moderate increase to O&M costs at the Essex PCP • Moderate to low O&M cost related to trucking • Minimal capital cost
Overall	Fair	Good

7.5 RECOMMENDED BIOSOLIDS MANAGEMENT STRATEGY

Table 7.7 provides an evaluation of the two (2) alternative biosolids management strategies. Based on the evaluation, Alternative No. 2 – Dewatering at Essex PCP and Disposal (at landfill) was identified as the preferred biosolids management strategy because it is a proven technological process with low capital cost requirements and minimal to no construction requirements. Construction of an on-site dewatering facility should be reconsidered when major upgrades are being considered at either wastewater treatment facility.

In terms of the technical suitability, dewatering at the Essex PCP is considered to have simple operation and maintenance requirements. This strategy would not require the design, construction, and operation of an onsite dewatering facility at the Colchester South Wastewater Treatment Facility. The capacity of the Essex PCP appears to be sufficient to accept additional sludge from the Colchester Facility. During the detailed design stage, the Essex PCP capacity should be further reviewed to determine if there is enough capacity to accept sludge from the Colchester Facility. In terms of the impact on the social and natural environment, this strategy would allow for a smaller footprint with low potential for offsite odour, noise, and vibration.

8.0 CONCEPTUAL DESIGN

8.1 TREATMENT PLANT SIZE AND STAGING

As noted in **Section 5.4** of this report, expansion of the Colchester South Sewage Works to an average daily flow of 3,700 m^3/d and a peak flow of 16,800 m^3/d would serve the growth requirements of the Colchester South service area for the 20-year flow projection. Prior to the year 2042, an analysis of the Colchester South service area should be completed to identify changes in wastewater servicing demands and determine if expansion to the ultimate design capacity is required. The ultimate design capacity is based on the anticipated ultimate level of development within the existing Colchester South service area plus Phase 1 and 2 of the Colchester Bay development. For the ultimate design, the projected average daily flow is 7,500 m^3/d with a projected peak flow of 32,800 m^3/d.

In this section of the report, proposed tank sizing and potential site configurations are presented for the expansion of the Colchester South Wastewater Treatment Facility. Two (2) phases of implementation are proposed for the facility which correspond to the 20-year and Ultimate design phases. Refer to the site plan of the proposed facility in **Figure 8.1** including a layout of both the 20-year and Ultimate design phases.

8.2 PREFERRED DESIGN APPROACH

The plant design and layout take into account the need for equipment and process redundancy to provide continuing treatment capability during maintenance and repair activities. The MECP publication "Design Guidelines for Sewage Works 2019" states that standby or redundant capabilities need to be provided for satisfactory operation of the sewage works during power failures, flooding, peak loads, equipment failure and maintenance shutdowns. Generally, sewage pumping stations and treatment works should be designed so that with the largest flow capacity unit out-of-service the hydraulic capacity of the remaining units can handle the design peak instantaneous flow. The design of a sewage treatment plant, since it has an effluent discharge into the environment, should be based on the premise that the failure of any single component should not prevent the sewage works from meeting the required effluent quality and quantity criteria, while operating at design flows (i.e., minimum to maximum design flows).

8.3 PROPOSED CONCEPTUAL DESIGN AND UNIT PROCESSES

8.3.1 Overview

The proposed conceptual design and unit processes are outlined in the following sections. Recommendations for both the 20-Year Design and Ultimate Design phases are included for the necessary unit processes. A schematic diagram of the overall process is shown **Figure 8.2.** The recommendations made in the following sections should be further investigated and refined during the detailed design (Phase 5 – Implementation).

8.3.2 Preliminary Treatment

A schematic diagram of the proposed preliminary treatment facilities including expansion phasing information is shown in **Figure 8.3.** The proposed preliminary treatment processes to be employed at the Colchester South Wastewater Treatment Facility includes the inlet pumping station, flow measurement, emergency plant bypass (for wet weather flow), screening and grit removal, phosphorus removal, and flow distribution chamber.

8.3.2.1 Inlet Pumping Station

Existing Pumping Station No. 1 consists of a 3,660 mm diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 94.2 L/s (8,140 m^3/d). As part of the sewage works expansion, the firm capacity of Pumping Station No.1 should be increased to 194 L/s (16,800 m^3/d). The phasing for Pumping Station No.1 upgrades is proposed as follows:

Current Design (20-Year Design Phase)

- Upgrade Pumping Station No.1 to firm capacity of 194 L/s (16,800 m^3/d).

Future Design (Ultimate Design Phase)

- Upgrade Pumping Station No.1 to firm capacity of 380 L/s (32,800 m^3/d).

8.3.2.2 Flow Measurement

Flow measurement is required for compliance reporting purposes and to properly monitor and control plant operations. The existing design is comprised of a magnetic flow meter that was installed on February 9th, 2020, in the forcemain to the inlet distribution chamber just downstream of Pumping Station No.1.

In the proposed design, Pumping Station No.1 will pump flow through a forcemain to the new flow diversion chamber. At this flow diversion chamber, excess wet weather flow will be diverted to a wastewater holding pond (existing lagoon). The proposed location for flow measurement devices is downstream of Pumping Station No. 1 and downstream of the UV Disinfection Building. This will allow for the measurement of influent and effluent flows.

8.3.2.3 Emergency Plant Bypass

The existing plant has a weir gate for the control of bypass flows to the existing outfall chamber. The gate is located downstream of the valve chamber, inside the inlet distribution chamber.

In the proposed design, a new flow diversion chamber will be located downstream of Pumping Station No.1 that will divert excess wet weather flow to a wastewater holding pond (existing lagoon). Flow from the wastewater holding pond will be redirected back to Pumping Station No.1 subsequent to the wet weather event. The requirements for additional emergency bypass systems will be further explored during the detailed design period.

8.3.2.4 Screening and Grit Removal

Screens are provided as part of preliminary treatment to remove rags, sticks, and other oversized debris from the incoming raw sewage flow. This is done to protect downstream equipment and processes from reduced operating efficiency, increased maintenance, blockage, or damage. Grit removal is provided in advance of secondary treatment to remove stones, sand, and other abrasive material to prevent undue wear of machinery and the unwanted accumulation of solids in channels and tanks.

The existing sewage works does not have screening and grit removal facilities since it is an aerated facultative sewage lagoon, that is designed to store solids and break them down over time. Currently raw wastewater leaves the inlet distribution chamber and flows to the primary cell of the lagoon system.

The proposed design requires screening and grit removal facilities prior to biological treatment. The screening and grit removal facility will be located directly downstream of the new flow diversion chamber. The phasing for implementation of the screening and grit removal facilities is proposed as follows:

Current Design (20-Year Design Phase)

- Installation of a Screening and Grit Removal Building including:
    - One mechanically cleaned bar screen in the influent channel;
    - One manually cleaned coarse bar screen in the bypass channel; and
    - One vortex grit system together with grit pump, cyclone, and classifier.

Future Design (Ultimate Design Phase)

- No changes needed.

8.3.2.5 Phosphorous Removal

The existing sewage works uses alum dosing for the removal of phosphorus. The phosphorus removal facility is located inside the control building just south of the lagoon. The alum dosage is controlled at the control building. The alum dosage is determined based on the runtime of the raw sewage pumps in pumping station No. 1. The existing phosphorus removal process consists of alum dosing at two locations: Pumping Station No. 1 directly into the wet well and the valve chamber, after PS No. 1, directly to the forcemain.

The proposed design will involve the addition of alum upstream of the sequencing batch reactors system.

8.3.2.6 Flow Distribution

For the existing treatment process, the inlet distribution chamber sends raw wastewater flow to the primary cell of the aerated lagoon treatment system. From the primary cell, flow is controlled by flow control chamber No.'s 1 and 2 and distributed into the secondary and tertiary cells.

The proposed flow diversion chamber will be located downstream of Pumping Station No.1, it will divert excess wet weather flow to a wastewater holding pond (existing lagoon). Following preliminary treatment, an additional flow distribution chamber will distribute flow into the future sequencing batch reactor tanks.

Current Design (20-Year Design Phase)

- Installation of one (1) flow distribution chamber to distribute flow to SBR tank No.'s 1, 2 and 3.

Future Design (Ultimate Design Phase)

- The flow distribution chamber will be modified to distribute flow to SBR tank No.'s 1, 2 and 3 as well as the additional SBR tank No.'s 4, 5, and 6.

8.3.3 Sequencing Batch Reactor (SBR) Treatment System

This section describes the facilities proposed for the SBR treatment system. A schematic diagram of the proposed biological treatment facilities including expansion phasing information is shown in **Figure 8.4.**

SBRs are a variation of the activated sludge process for the treatment of wastewater. They differ from activated-sludge plants because all treatment steps and processes are combined into a single basin or tank. The operation of an SBR is based on a fill-and-draw cycle, consisting of five steps – fill, react, settle, decant, and idle. In the fill phase, raw wastewater flows directly into the aeration tank to provide food to the microbes in the activated sludge and create an environment for biochemical reactions to occur. While in the aeration tank, the wastewater is aerated over a number of "air-on/air-off" cycles, also known as the react phase. Mechanical mixing and aeration allow for further reduction of wastewater parameters, such as carbonaceous BOD removal, denitrification, and phosphorous removal. During the settle phase, solids-liquid separation occurs during the air-off part of the cycle. The decant step is the latter part of the air-off cycle, where treated effluent is decanted or withdrawn from the liquid surface. The idle phase occurs between the decant and fill phase, which consists of pumping out a small amount of the activated sludge at the bottom of the tank. The following phasing is proposed:

Current Design (20-Year Design Phase)

- Install three (3) sequencing batch reactors, each equipped with fine bubble diffused aeration (SBR tank No.'s 1, 2, and 3); and
- Install a total of three (3) waste activated sludge pumps one (1) for each tank.

Ultimate Design Phase

- Install three (3) additional sequencing batch reactors, each equipped with fine bubble diffused aeration (SBR tank No.'s 4, 5 and 6); and
- Install a total of three (3) additional waste activated sludge pumps one (1) for each tank.

8.3.4 Sludge Processing

Details of the preferred biosolids management strategy are presented in **Section 7.0.** Under the proposed strategy, liquid sludge from the SBR process will be removed and temporarily stored in an aerated sludge holding tank. Periodically the sludge would be transferred by truck to the existing dewatering facility at the Essex PCP. The dewatered sludge would then be disposed of by landfilling. The phasing for implementation of sludge processing facilities is proposed as follows:

Current Design (20-Year Design Phase)

- Installation of aerated sludge holding tank system equipped with sludge transfer pump.

Future Design (Ultimate Design Phase)

- Installation of additional aerated sludge holding tank system equipped with sludge transfer pump.
- Optional – One (1) dewatering building equipped with the following:
  - One (1) dewatering centrifuge;
  - One (1) polymer feed system; and
  - One (1) odour control system equipped with scrubber assembly and chemical metering pumps.

8.3.5 Disinfection

A schematic diagram of the proposed disinfection facilities including expansion phasing information is shown in **Figure 8.5.** The existing plant does not currently have a UV disinfection system. The following phasing for the UV disinfection system is proposed:

Current Design (20 Year Design Phase)

- Construct a new UV disinfection facility with one channel and one bank of UV lights to handle the 20-year design peak flow projection of 16,800 m^3/d and accommodate a future second bank.

Future Design (Ultimate Design Phase)

- Add a second bank of UV lights to the existing facility to increase total UV capacity to the ultimate design peak flow projection 32,800 m^3/d.

8.3.6 Future Tertiary Treatment Unit

In the detailed design, the future addition of tertiary treatment should be considered, in the case that the MECP requires the proposed facility to meet more stringent effluent criteria, or the facility experiences significant changes in influent characteristics.

8.3.7 Outfall to Lake Erie

The outfall to Lake Erie is composed of two major sections. The first section is between the Outfall Chamber and Valve Chamber, which makes up the underground portion of the outfall. This section of the outfall piping is a 500 mm diameter cement lined ductile iron pipe. The second section is between the Valve Chamber and the Diffuser, which makes up the underwater portion of the outfall. This section of the outfall piping is a 560 mm diameter polyethylene pipe. Further, the effluent discharges through a multi-port diffuser located 600 metres offshore in Lake Erie. It is anticipated that there will be no changes required to the existing outfall system for the 20-year or ultimate design.

9.0 ENVIRONMENTAL IMPACTS AND MITIGATING MEASURES

9.1 OVERVIEW

Table 9.1 provides a summary of potential environmental impacts and proposed mitigating measures for the recommended design. In general, the construction and operation of the recommended design will have a limited effect on the environment. The implementation of the proposed design may be disruptive to surrounding residents due to construction activities, but this impact is anticipated to be temporary and relatively short in duration. The impacts on air quality, noise, and vibration, and community life will be mitigated through standard construction procedures. It is anticipated that the proposed work will not have a significant effect on the natural environment such as wildlife, vegetation, or the habitat characteristics of any particular species given that the mitigation measures outlined in the following sections are followed. With respect to other socio-economic impacts, it is anticipated that the preferred alternative will not have any serious lasting impact on Cultural or Built Heritage.

Table 9.1 Environmental Effects and Mitigating Measures

Operation	Impact	Mitigating Measures
Cutting, digging, or trimming ground covers, shrubs, and trees	Reduced terrestrial wildlife habitat quality (i.e., diversity, area, function) and increased fragmentation of habitat.	• Plan to rehabilitate temporary disturbance areas with a native seed mix (i.e., a mix dependent of the existing vegetation community).
	Loss of unique or otherwise valued vegetation features	• Where possible, existing vegetation features will be restored to a preconstruction condition.
Trenching / tunnelling, excavation, and construction for wastewater treatment facilities at the Colchester South Sewage Works site	Soil erosion and sediment transport to adjacent water bodies causing sedimentation and turbidity of adjacent water bodies and drainage ditches	• Use of erosion control measures (i.e. sediment traps, silt fences, etc.) • Use of nature-based solutions for erosion control (i.e. vegetative filter strips, mechanical seedings, mulching, growth erosion control blanket, etc.) • Collect contaminated runoff • Restore vegetation growth quickly • Stage construction activities to minimize potential of adverse impacts
	Reduced water quality and clarity due to increased erosion and sedimentation, and transport of debris.	• Apply wet weather restrictions to construction activity. • Comply with any local regulations, policies and guidelines that stipulate a minimum acceptable buffer width (the allowable distance from a water body). Maximum buffer widths are desirable.

Operation	Impact	Mitigating Measures
		• If possible, direct surface drainage away from working areas and areas of exposed soils. To the maximum extent possible, promote overland sheet flow to well vegetated areas. • Install and maintain silt curtains, sedimentation ponds, check dams, cofferdams or drainage swales, and silt fences around soil storage sites and elsewhere, as required.
	Loss of vegetation and topsoil and mixing topsoil and subsoil	• Restore site by replacing topsoil and reinstate vegetation to prevent erosion
	Removal and/or disturbance of trees and ground flora	• Avoid treed areas where possible • Employ tree protection measures • Replace trees and provide site landscaping
	Temporary disruption of pedestrian and vehicle traffic	• Provide and maintain detours • Provide safe alternate routes • Select alternate routes with minimal inconveniences
	Temporary disruption and inconvenience during construction to adjacent properties, buildings, and inhabitants	• Notify public agencies and neighbouring owners of construction activities • Prepare program for reporting and resolving problems • Ensure access is provided for emergency vehicles and personnel • Apply noise and vibration control measures • Apply dust control measures • Control emissions from construction equipment and vehicles • Use silencers to reduce noise • Require compliance with municipal noise by-laws
	Possible need to remove petroleum contaminated excavated material.	• Sample material. • Handle and dispose of contaminated material in an acceptable manner
	Decreased ambient air quality due to dust and other particulate matter.	• Avoid site preparation or construction during windy and prolonged dry periods. • Cover and contain fine particulate materials during transportation to and from the site. • Instruct workers and equipment operators on dust control methods. • Spray water to minimize dust off paved areas or exposed soils. • Stabilize high traffic areas with a clean gravel surface layer or other suitable cover material.

Operation	Impact	Mitigating Measures
		• Cover or otherwise stabilize construction materials, debris, and excavated soils against wind erosion.
	Disturbance to microscopic organisms in the soil.	• Limit the size of stockpiles to avoid anaerobic conditions. • Protect stockpiled soils from exposure to and sterilization by solar radiation (or stockpile in an uncovered shaded area).
	Reduced soil capability through compaction and rutting, and mixing of topsoil and layers below.	• Avoid working during wet conditions and/or confine operation to paved or gravel surfaces. • Whenever possible, strip and store topsoil separately from the layers below and return to excavation in sequence.
	Industrial disruption of field/facility access.	• All driveways, roadways and field access will be restored to pre-construction condition. • Staging of construction and advance notice to property owners prior to disruption of construction to minimize inconvenience.
	Disruption of tile and surface drainage systems.	• Provide for temporary drainage systems until final restoration is accomplished. • Avoid disturbing drainage systems during critical periods. • All existing culverts, tiles, and drainage systems to be restored to pre-construction conditions following construction.
	Reduced water quality of nearby surface waters having value as wildlife habitat.	• Design drainage systems and stormwater management measures to reduce changes in drainage to watercourses. • Use sediment control techniques for stockpiled materials to minimize degradation of water quality.
	Modifications or removal of aquatic habitat.	• Stage construction to minimize potential for adverse impacts.
	Residential impacts.	• Construction noise and dust impacts will be controlled through noise by-laws and dust control measures in contract specification. • Inconvenience due to temporary loss of property access will be minimized through proper communication and advance notice of disruption. • Pedestrian safety will be maintained through excavation barricades and construction fencing
	Traffic disruption.	• Construction activities will attempt to maintain a minimum of one lane of open traffic at all times with necessary detour signage and flag persons.

Operation	Impact	Mitigating Measures
		• If complete closure is required, emergency services will be advised in advance and access will be restored at the end of each working day.
	Recreation.	• Maintain access to recreational sites during construction.
	Archaeological resources.	• The Hutchin's Cemetery, a pioneer family cemetery was identified in the Stage 1 archaeological assessment and the Heritage Overview Memo. • A Stage 2 Archaeological Assessment and any further recommended assessment (e.g. Stage 3-4) will be completed as early as possible during detailed design and prior to any ground disturbance. • Discussions with the MCM and Bereavement Authority of Ontario (BAO) will take place to determine avoidance & protection and/or mitigation measures around the Hutchin's Cemetery. • Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out an archaeological assessment, in compliance with Section 48(1) of the Ontario Heritage Act. • The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with Ontario Regulation 30/11 the coroner shall notify the Registrar, Ontario Ministry of Public and Business Service Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.

Operation	Impact	Mitigating Measures
	Built heritage resources and cultural heritage landscapes.	• The final design and the construction footprint for the WWTF should be designed in a manner that avoids potential impacts to the Hutchins Cemetery. This should be done through establishment of a 50 metre buffer surrounding the currently identified boundaries of the cemetery. Detailed designs for the WWTF should be provided to a Cultural Heritage Specialist and Archaeologist for review at 30%, 60%, 90%, and 100% stages to provide feedback, if any, on the potential interactions with the cemetery and advise on the mitigation measures identified above. The location of the cemetery should be mapped on construction maps and temporary fencing should be installed. Staging and laydown areas should be selected to be non-invasive and avoid the cemetery's currently understood property boundaries. • Should the preferred option described above not be feasible and Project work is required within 50 metres of the Hutchins Cemetery, the alternative mitigation option should be applied. This includes preparation of a property specific HIA prior to completion of detailed design. The HIA should confirm the heritage attributes and boundaries identified within the designating by-law in order to review the potential for impacts to the cemetery as a result of the Project. The HIA should consider the compatibility of the Project with identified heritage attributes of the cemetery and include recommendations and mitigation measures where impacts are identified. The HIA shall be submitted to the MCM, municipality, and other interested parties for review and comment.
Use of construction equipment	Contamination of surface waters, drains and public roadways from spills, leaks or equipment refueling.	• Use containment facilities. • Inspect equipment regularly for fuel and oil leaks. • Clean equipment before it travels off site.
	Decreased air quality due to vehicular emissions causing increased concentrations of chemical pollutants.	• Minimize operation and idling of vehicles and gas-powered equipment, particularly during local smog advisories. • Use well-maintained equipment and machinery within operating specifications.

Operation	Impact	Mitigating Measures
	Disruption to wildlife migration and movement patterns, breeding, nesting, or hibernation.	• Vegetation cleaning should occur outside of the primary nesting period for migratory birds (April 1 – August 31 for southern Ontario) • No-disturbance buffer (5 m – 60 m) will be set out upon discovery of any migratory bird's nests within the work area
	Introduction of non-native vegetation, including opportunistic species.	• Clean heavy machinery and equipment prior to transporting to new location.
	Loss of unique or otherwise valued vegetation features	• Avoid or minimize trampling vegetation with equipment. • Minimize physical damage to vegetation by avoiding pushouts and avoiding the placement of splash onto living vegetation.
	Reduced water quality and clarity due to increased erosion and sedimentation, and transport of debris.	• Operate heavy machinery on the shore above the normal water level. • Where possible, conduct activities in the dry, above the actual water level and above any expected rises in water level that may occur during a rainfall or snowmelt event.
	Reduced water quality due to inputs of contaminants from surface runoff during construction and operation.	• Refuel equipment off slopes and well away from water bodies. • Securely contain and store all oils, lubricants, fuels, and chemicals. If necessary, use impermeable pads or berms.

9.2 MONITORING PROGRAM

The potential environmental impacts and corresponding mitigation measures described in **Section 9.1** will require monitoring during construction and operation of the proposed facility. The monitoring program is to track impacts to the natural, social, archaeological, and cultural heritage environments, as applicable. Specific monitoring requirements such as monitoring period, frequency, locations, methods, analysis, evaluation and more, shall be incorporated into the construction documents during the detailed design stage. The development of this program during the detailed design stage will provide instructions which are suitable to the exact location of the facility and synchronized with the construction scope of work and schedule. The responsibilities of this monitoring program should be assigned to designated individuals based on the type surveys and methods required. The program will monitor impacts, oversee the proper use of mitigation measures, and describe a strategy for addressing unexpected environmental effects. Caldwell First Nation expressed interest in fielding staff to participate in aspects of the monitoring program. Refer to **Appendix D** for documentation of consultation with Indigenous communities during the Environmental Assessment Process.

9.3 NATURAL ENVIRONMENT

9.3.1 Aquatic and Terrestrial Habitat

The proposed work area may contain natural features that support habitats of endangered species and threatened species. As per Section 2.1.7 of the Provincial Policy Statement (PPS) – "Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements." All issues related to the provincial *Endangered Species Act* (ESA) and its regulations shall be addressed prior to the construction of the proposed work.

If the proponent believes that their proposed activities are going to have an impact on Species at Risk or are uncertain about the impacts, they should contact SAROntario@ontario.ca to undergo a formal review under the ESA. It is the responsibility of the proponent to ensure that Species at Risk (SAR) are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the proposed activities to be carried out on the site.

Stantec completed a site investigation on March 2nd, 2023, to document existing natural heritage conditions in the site area. Surveys included Ecological Land Classification (ELC) of vegetation communities, Migratory Bird Nest survey, Bat Maternity Roost Tree survey, Significant Wildlife Habitat assessment, a SAR Habitat Suitability assessment of terrestrial features, and a Fish Habitat assessment of the Wilson D&W Drain. The natural heritage features that were identified through the background review were confirmed during the field surveying. As per MECP guidance, any trees greater than 10 cm diameter breast height are suitable for bat maternity roost habitat, and as such, if trees removal is required for the proposed work, bat SAR should be considered.

Suitable habitat for ten (10) SAR identified in the background review were present in the Study Area: Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tricoloured Bat, Chimney Swift, Eastern Meadowlark, Red-headed Woodpecker, Yellow-breasted Chat, Butternut and Eastern Foxsnake. The Eastern Foxsnake is listed as an endangered species under the ESA and has regulated habitat under Ontario Regulation 242/08 of the ESA. The Study Area provides many of the preferred habitat types for the Eastern Foxsnake including forest, forest edge, watercourse, prairie, hedgerow, old field, rotting logs and log piles. There is a high potential for Eastern Foxsnake to be present in the Study Area. Consultation with MECP would be required to confirm requirements under the ESA. However, it is anticipated that permitting under the ESA will be required for development within the Site. The Natural Heritage Assessment report is included in **Appendix E**.

9.3.2 Protection of Migratory Birds

The Migratory Birds Convention Act, 1994 (MBCA) provides legal protection of migratory birds and their nests in Canada. Construction timing must consider restrictions imposed by the MBCA. To avoid damaging or disturbing bird nests and contravening the MBCA, the timing of any vegetation clearing should occur outside of the primary nesting period (i.e., the period when the percent of total nesting species is greater than 10% based on Environment Canada's Nesting Calendars and the period for which due diligence mitigation measures are generally recommended).

9.3.3 Wildlife Protection

The installation of exclusionary fencing around the work area will reduce the likelihood of reptiles entering the work area. A terrestrial ecologist should be consulted during exclusionary fencing design. In addition, a visual search of the construction area (including machinery) is recommended each day to locate and avoid reptiles, amphibians, and other wildlife. If wildlife is encountered, they will be given reasonable time to flee the area on their own.

Any observations of species at risk or species of conservation concern (e.g., Eastern Foxsnake) should be reported to MECP and MNRF within 48 hours. Species at risk should not be handled, harassed, or moved in any way, unless they are in immediate danger. Any sediment and erosion control measures, such as fencing or blanket, utilized on the site during construction will avoid products with plastic mesh due to risk of entanglement of snakes or other wildlife.

9.3.4 Protection of Fish and Fish Habitat

In addition to the measures to protect water quality presented in **Table 8.1**, the following measures are recommended to protect fish and fish habitat during construction if in-water work is required, although there is no work proposed in the Wilson D&W Drain:

- If in-water work is required, reduce the duration of in-water work to the extent possible.
- Conduct in-water work during periods of low flow to allow work in water to be isolated from flows.
- Schedule in-water work to occur during the applicable in-water work timing window.
- If in-water work is required, develop, and implement a project-specific fish relocation plan to relocate fish from within an in-water work area. The Contractor must obtain a Licence to Collect Fish for Scientific Purposes from the MNRF prior to the commencement of in-water work.
- Screen water intake pipes to prevent entrainment or impingement of fish following the measures as outlined in DFO's Interim Code of Practice for End-of-pipe Fish Protection Screens for Small Water Intakes in Freshwater (DFO 2022b).
- Where applicable, manage and treat dewatering discharge to reduce the risk of erosion and/or release of sediment-laden or contaminated water to surface waters.

9.3.5 Erosion and Sediment Control

An erosion and sediment control (ESC) plan should be developed and employed during construction to reduce the risk of erosion and the entry of sediment into surface water and other natural features. Mitigation included in the plan should include the following measures:

• Implement project-specific temporary ESC measures per prior to starting work (e.g., silt fence and/or sediment logs).

• Keep additional ESC materials available on site to provide a contingency supply in the event of an emergency.

• Monitor and maintain erosion and sediment controls, as required. Controls are to be removed only after the soils of the construction area have stabilized and vegetation cover has reestablished.

• Stabilize materials requiring stockpiling (fill, topsoil, etc.) and keep a safe distance (> 30 m) from watercourses.

9.3.6 Excess Soil Materials and Waste

In 2019, the MECP introduced O. Reg. 406/19 entitled 'On-site and Excess Soil Management' under the Environmental Protection Act. All excess soil materials and waste generated during the construction process must be disposed of in accordance with O. Reg. 406/19.

9.3.7 Floodplain Hazard Management

The proposed work site is under the jurisdiction of the ERCA. Portions of the existing service area contains lands which are subject to the ERCA's Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation under the Conservation Authorities Act (Ontario Regulation No. 158/06), falling within the Limit of Regulated Area of Lake Erie. Therefore, any works within a regulated area will be required to obtain a Permit and/or Clearance from the Essex Region Conservation Authority prior to any construction or site alteration or other activities affected by Section 28 of the Conservation Authorities Act.

The existing Colchester South Sewage Works facility is immediately adjacent to the Lypps Beach Provincially Significant Wetland (PSW). Mitigations measure should be utilized to minimize any negative impacts on significant natural heritage features that could be potentially affected by the proposed work.

Lands within the "Floodplain Development Control Area" in the Town of Essex Official Plan, being lands along inland watercourses, are lands along inland watercourses that have been identified as being susceptible to flooding. They are subject to flooding under regulatory flood conditions (1:100 year or maximum observed) and are subject to Ontario Regulations 158/06, as implemented by the ERCA. Lands within the "Lake Erie Flood-prone Area" in the Town of Essex Official Plan are areas that have been identified as being susceptible to flooding.

The proposed work site is situated outside the periphery of lands that are designated as Floodplain Development Control Areas and Lake Erie Flood-prone Areas in the Town of Essex Official Plan. Specific flood proofing measures are not considered to be undertaken on the site.

9.3.8 Source Water Protection

For the protection of local municipal drinking water sources, the Essex Region Source Protection Plan (SPP), which has been established under the Clean Water Act, 2006 (Ontario Regulation 287/07), came into effect on October 1, 2015.

The Clean Water Act (2006) refers to four types of Vulnerable Areas, which include:

- Intake Protection Zones
- Wellhead Protection Areas
- Highly Vulnerable Aquifers
- Significant Groundwater Recharge Areas

The types of Vulnerable Areas are addressed further below in relation to this project location.

9.3.8.1 Intake Protection Zones (IPZs)

There is one municipal Water Treatment Plant (WTP) in the region, the Harrow-Colchester South WTP, having its intake in Lake Erie (refer to **Figure 9.1,** Map 11 of the Essex Region SPP in **Appendix A**). Intake Protection Zones are areas of land and water, where run-off from streams or drainage systems, in conjunction with currents in lakes and rivers, could directly impact the source water at the municipal drinking water intakes.

An Intake Protection Zone can be described as a defined area surrounding a surface water body intake. The size and shape of each zone in an IPZ represents either a set distance around the intake pipe, or the length of time it would take water and contaminants to reach the intake:

- IPZ-1 is the area closest to the intake pipe and is a set distance which extends one kilometre upstream and 120 meters onto the shore.

- IPZ-2 includes the on and offshore areas where flowing water and any pollution would reach the intake pipe within two hours.

- IPZ-3 is an area where contaminants could reach the intake pipe during and after a large storm.

According to the Approved Source Protection Plan for the Essex Region Source Protection Area (ERSPA), Lake Erie in the study area is characterized to be an Intake Protection Zone 2 (IPZ-2) with low vulnerability (4.8) less than 5.0.

Portions of the Colchester South service area fall within a Surface Water Intake Protection Zone, IPZ-2. The ERCA is the designated Risk Management Official/Inspector providing Risk Management Services for the ERSPA. Proposed work within this area may require approval by the Essex Region Risk Management Official (RMO) to ensure that threats to potential drinking water are mitigated. The RMO should be contacted for further information regarding Source Water Protection and the applicable source protection plan policies that may apply to the site.

9.3.8.2 Wellhead Protection Areas

Wellhead Protection Areas are not applicable in the Essex Region, as none of the municipal drinking water systems are supplied by groundwater.

9.3.8.3 Highly Vulnerable Aquifers (HVAs)

Highly Vulnerable Aquifers (HVAs) are defined as aquifers on which external sources have or are likely to have a significant adverse impact and include the land above the aquifer.

In the ERSPA these HVAs are generally located in the sandy soil areas in the southern part of the region, including most of Pelee Island (refer to **Figure 9.2,** Map 4 of the Essex Region Source Protection Plan in **Appendix A**). A portion of the east end of the service area for this EA falls within a HVA with high vulnerability (6.0). There are no associated Significant Drinking Water Threats (SDWTs) or policies within this area because the municipal water treatment plant does not use groundwater as its supply. The sensitive nature of this feature will be considered because these areas are at a greater risk for contamination from land use activities. Proper mitigation measures will be taken to ensure that the proposed work does not result in increased risk of contamination of the aquifer.

9.3.8.4 Significant Groundwater Recharge Areas (SGRAs)

Significant Groundwater Recharge Areas (SGRAs) are defined as per Regulation 287/07 as areas within which it is desirable to regulate or monitor drinking water threats that may affect the recharge of an aquifer. Groundwater recharge occurs where rain or snowmelt percolates into the ground and flows to an aquifer. The greatest recharge usually occurs in areas which have loose or permeable soil such as sand or gravel that allows the water to seep easily into the aquifer.

Most of the SGRAs in the ERSPA are in the southern Essex Region in sandy soil areas, such as Harrow, Leamington, Kingsville, and limited parts of the Turkey Creek and Pelee Island subwatersheds (refer to **Figure 9.3**, Map 5 of the Essex Region Source Protection Plan in **Appendix A**). Portions of land on the east end of the service area for this EA fall within SGRAs with medium to high vulnerability (4.0 to 6.0). There are no associated Significant Drinking Water Threats (SDWTs) or policies with this area because the municipal water treatment plant does not use groundwater as its supply. The sensitive nature of this feature will be considered because these areas are at a greater risk for contamination from land use activities. Proper mitigation measures will be taken to ensure that the proposed work does not result in increased risk of contamination of the recharge area.

9.3.8.5 Overall Vulnerability Assessment Summary

Project activities in vulnerable areas need to be assessed to determine the risk they pose. The Clean Water Act requires that significant threats be managed to reduce the threat to a point where it is no longer significant. Action may be taken to address low and moderate threats at the discretion of the Source Protection Committee. **Table 8.2** provides a summary of threats to vulnerable areas and the subsequent actions to be taken, relating to this project.

Table 9.2: Summary of Threats to Vulnerable Areas

Vulnerable Area	Threat Potential	Action Taken
Intake Protection Zone	Low	None
Wellhead Protection Areas	Not applicable	None
Highly Vulnerable Aquifer	Not applicable	None
Significant Ground Water Recharge Areas	Not applicable	None

9.3.9 Permits to Take Water

If the proposed work requires the use of dewatering systems, the acquisition of a Permit to Take Water (PTTW) will be required from the MECP. Any water extraction over 50,000 L/day will require MECP approval under the *Environmental Protection Act* and *Ontario Water Resource Act*. However, certain water taking activities that have been prescribed by the Water Taking Regulation O. Reg. 63/16, such as some construction dewatering, may require Environmental Activity and Sector Registry (EASR) registration instead of a PTTW. Regardless, a PTTW is required if the water-taking exceeds 400,000 L/day.

9.3.10 Active / Former Waste Sites

The existence and location of any active and/or former waste disposal sites within the study area was carefully reviewed. A listing of information about large and small landfills in Ontario that includes open/closed status, site owner, site location, and Certificate of Approval number are available from Government of Ontario 's website.

There is no large or small waste disposal site in the region. The proposed wastewater treatment facility is located far away from any active/former waste disposal sites, the proposed work is not expected to have any impact on the migration of methane and/or leachate from nearby active and/or former waste sites.

9.3.11 Climate Change

Climate encompasses all aspects of weather, including temperature, precipitation, air pressure, humidity, wind speeds, and cloudiness. Weather and climate are not static processes and variability is often normal. Weather, for example, changes on a daily and sometimes hourly basis. Weather can also change on a monthly basis, through the changing of seasons. When climate changes on a global scale, it is referred to as Climate Change.

Since the beginning of the industrial revolution in the 18th century, excessive emission of greenhouse gases, like carbon dioxide and methane, have been released through human activities, causing an increased percentage of solar radiation to be trapped in our atmosphere. In recent decades the effect of this on climate has become clearer. As more energy is retained within the atmosphere, a general increasing trend in global temperatures has occurred.

Regardless of the cause, the average temperature in Windsor has increased by almost 1°C since 1940. As air temperatures increase, so does the capacity of the air to hold more water leading to more intense rainfall events. The closest Environment Canada weather station to the study area is located in Amherstburg, it has been monitoring and recording weather data since 1981. Since this time, an increasing trend in annual precipitation has been documented.

The effects of climate change are expected to include an increase in the number and severity of storms, leading to increased precipitation. Since 1970, there has been increasing evidence of heavier short duration (24 hours or less) rain events in southern Ontario.

Climate changes related to increasing rainfall in the region have a significant impact on municipal sewer systems. The Windsor-Essex Region recently experienced a significant rainfall event that inundated and overwhelmed the area's sanitary and storm sewer system/facilities. In the last decade alone, this region has experienced six (6) significant storm events that have surpassed current 1:100-year regulatory standards and have resulted in urban flooding issues and sewer backups that have impacted hundreds of homes and businesses in the region. As such, historical data regarding the likelihood of major flooding events must be reconsidered. It is important that the proposed work for wastewater treatment continues to operate effectively in the future. A solution needs to be identified to provide resiliency to the impacts of climate change.

The Town of Essex's *Climate Ready: Climate Change Adaptation Plan (CCAP) 2021* notes that focus needs to be directed towards the routes for mitigation and adaptation of climate change. The mitigation route includes sustainable transportation, energy efficiency, clean energy. The adaptation route consists of infrastructure upgrades, flood protection, health risk management and disaster management and business continuity. The CCAP lists actions to accomplish both mitigating and adapting to climate change, such as agricultural diversification, water conservation, education, and natural environment preservation. **Table 9.3** which is obtained from The Town of Essex CCAP 2021 summarizes the historical rainfall data and rainfall projections.

Table 9.3: Town of Essex Historical Rainfall Averages and 2040 Rainfall Projections

	Recent Past Avg. (1976-2005)	**2040 Projection**
Annual Avg. Precipitation (mm)	825.0	851.2
Average yearly total precipitation is projected to increase by 2040.		
Avg. Spring Precipitation (mm)	218.0	242.8
Springtime rain events are projected to increase by 11% in 2040. Rainfall is expected to fall faster, and shorter storms will have increasingly higher intensity.		
Avg. Summer Precipitation (mm)	220.0	191.5
Summer rain is expected to decrease by 13% in 2040, resulting in increased evaporation rates from ground and lake surfaces.		

Avg. Winter Precipitation (mm)	181.0	190.3
Winter precipitation rates and frequencies are expected to increase. More rainfall and freezing rain events instead of snow, as we progress further towards 2040.		

The Provincial Policy Statement (2020), which is issued under section 3 of the Planning Act, provides policy direction on matters of provincial interest related to land use planning and development. The PPS (2020) includes a number of policies related to planning in preparation for impacts of a changing climate for the development of; healthy, livable, and safe communities, settlement areas, infrastructure and public service facilities, sewage and water services, and stormwater management.

Policy 1.8.1 under Section 1.8: Energy Conservation, Air Quality and Climate Change, states:

- Planning authorities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions and preparing for the impacts of a changing climate through land use and development patterns.

Policy 2.2.1 (c) under Section 2.2: Water, states:

- Planning authorities shall protect, improve or restore the quality and quantity of water by evaluating and preparing for the impacts of a changing climate to water resources systems at the watershed level.

The complete Provincial Policy Statement (2020) document is available via the following link:
Provincial Policy Statement, 2020 | ontario.ca

To complement and support the above climate-focused policies of the Provincial Policy Statement, the MECP has issued a guidance "Considering climate change in the environmental assessment process". The consideration of the Climatic Features including drought, increased flooding, changes in water levels, increases in surface water runoff due to extreme weather events and climate changes, is also noted in Appendix 2 of the Municipal Class EA (2023).

During the design phase, the primary technical considerations when evaluating alternative treatment process components shall include the ability of a component to consistently meet requirements for energy conservation and greenhouse gas emission reductions, the established treatment requirements, the feasibility of locating a suitable space for the plant expansion, the ability of the improved process to handle variations in hydraulic and organic loadings, and capital and operating costs. Green infrastructure (e.g., permeable surfaces, trees and planting), which can help reduce flooding and water pollution by absorbing and filtering stormwater, is to be considered in the final design of the sewage works expansion.

9.4 COMMUNITY

9.4.1 Disruption of Traffic

Construction of the proposed work may result in temporary detours or lane restrictions that will disrupt traffic in the area and interfere with access for some residents and businesses. All emergency services will be

notified of detours prior to commencement of construction. Services that may experience temporary detours or delays include school buses, mail delivery and garbage collection.

Table 9.1 lists measures to lessen the disruption of traffic including, providing, and maintaining detours, providing safe alternate routes, and selecting alternate routes that will minimize any inconvenience to the community.

9.4.2 Proximity to Existing Dwellings

9.4.2.1 MECP D-2 Guideline

The MECP has developed Guidelines with respect to recommended separation or buffer zone distances between various sizes and types of wastewater treatment facilities and nearby "sensitive" land uses. In the MECP Design Guidelines for Sewage Works, a sensitive land use is defined as:

> A building, 'amenity area' or outdoor space where routine or normal activities occurring at reasonably expected times would experience 1 or more 'adverse effect(s)' from contaminant discharges generated by a nearby 'facility'. The 'sensitive land use' may be a part of the natural or built environment. Depending upon the particular 'facility' involved, a sensitive land use and associated activities may include one or a combination of:
>
> i. residences or facilities where people sleep (e.g., single and multi-unit dwellings, nursing homes, hospitals, trailer parks, camping grounds, etc.). These uses are considered to be sensitive 24 hours/day.
> ii. a permanent structure for non-facility related use, particularly of an institutional nature (e.g., schools, churches, community centres, day care centres).
> iii. certain outdoor recreational uses deemed by a municipality or other level of government to be sensitive (e.g., trailer park, picnic area, etc.).
> iv. certain agricultural operations (e.g., cattle raising, mink farming, cash crops and orchards).
> v. bird/wildlife habitats or sanctuaries.

MECP Guideline D-2, Compatibility between Sewage Treatment and Sensitive Land Use indicates that:

> Where practical, sensitive land uses should not be placed adjacent to treatment facilities. When new facilities or enlargements to existing facilities are proposed, an adequate buffer area should be acquired as part of the project. Plants with a capacity of less than or equal to 500 m^3/d have a recommended separation distance of 100 meters. Plants with a capacity greater than 500 m^3/d but less than 25,000 m^3/d have a minimum separation distance of 100 meters, and a recommended separation distance of 150 meters. Plants with a capacity greater than 25,000 m^3/d may require a minimum separation distance greater than 150 meters.

The proposed ultimate capacity of the Colchester South Wastewater Treatment Facility is 7,500 m^3/d; therefore, a separation distance of 100 meters is required. The proposed site plan is being proposed using

the required separation distance from the MECP D-2 Guideline, (100 metres for plants between 500 m^3/d and 25,000 m^3/d). The proposed site plan with this 100-meter buffer zone is shown in **Figure 8.1**. In the future, the option for developers to subdivide and create lots on the properties adjacent to the facility is governed by this setback as well as other applicable Town Planning Policies.

9.4.2.2 Official Plan Buffer Zone Guideline

The Town of Essex Official Plan includes guidelines surrounding lot creation in proximity of sewage treatment facilities. The guidelines states "a consent to sever or plan of subdivision application for the purpose of creating a residential lot or a lot for any other sensitive land use shall not be granted, if it would result in the construction of a new dwelling or other sensitive land use within 400 metres of a lot on which a sanitary sewage lagoon or sanitary sewage treatment facility is located, whether or not the facility is within the boundaries of the Town, unless the proposed development meets the guideline provisions of MOE Guideline D-2, Compatibility Between Sewage Treatment and Sensitive Land Use' which will serve to determine setbacks and buffering requirements between any treatment works and a sensitive land use."

The existing sewage treatment lagoon system is located approximately 100 meters from the closest resident's property line, as per the Town of Essex Interactive Mapping Service. Aerated lagoons have a much higher odour potential compared to that of the proposed SBR treatment plant. The proposed plant is not expected to produce excessive odours or noise that would require a separation distance as far as 400 metres. Therefore, the Town of Essex buffer zone guideline of 400 metres between sewage treatment and sensitive land use is not imperative in order to mitigate odour and noise from the proposed expansion. The separation distance of 100 meters required by the MECP D-2 Guideline is sufficient to mitigate potential odour and provide adequate attenuation for noise produced from the proposed sewage works. The application of odour control methods and noise reduction equipment can be considered during the detailed design stage as needed.

9.4.3 Proximity to Wetland District

The proposed site location on Lot 83, Concession 1 in the Town of Essex, located directly west of the existing Colchester South lagoons is owned by the Town of Essex. This field is an ERCA regulated wetland buffer that underwent a restorative tree planting program. The field is adjacent to the Lypps Beach Provincially Significant Wetland (PSW), refer to **Figure 9.5** of the Lypps Beach PSW. A portion of the Wilson D&W municipal drain falls within the Lypps Beah PSW area. The Ontario Regulation 158/06 "Essex Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses" was reviewed.

Section 2, (b), (i) of O. Reg 158/06 states that:

> "No person shall undertake development or permit another person to undertake development in or on the areas within the jurisdiction of the Authority that are, (b) river or stream valleys that have depressional features associated with a river or stream, whether or not they contain a watercourse, the limits of which are determined in accordance with the following rules: (i) where the river or

> stream valley is apparent and has stables slopes, the valley extends from the stable top of the bank, plus 15 metres, to a similar point on the opposite side."

During field assessments, the distance between the stable top of the bank (Wilson D&W drain) and the edge of the field (Lot 83) was measured in three different locations. In all three locations, the distance was approximately 10 metres.

The proposed site plan is located greater than 5 metres from the edge of the field resulting in a separation distance of greater than 15 metres. However, during the detailed design stage, the site layout of the proposed SBR plant should be reviewed in accordance with the aforementioned regulation to ensure there is a minimum of 15 metres from the stable top of the Wilson D&W drain.

9.5 GENERAL PROPERTY REQUIREMENTS

There does not appear to be any property and easement requirements for the proposed Colchester South Sewage Works Expansion.

If there is any property or easements is required, the Town will acquire property and easement at fair market value, which basically means that it is sold at the price that other real estate is selling for in that area. The Town may obtain the services of an accredited appraiser to assist in establishing the fair Market value and related compensation for any 'land' required for the Project.

Below is a brief description of typical process for the property acquisition:

a) Identify and contact effected property owners
b) Procure the services of qualified appraiser
c) Present Letter of Offer to property owner
d) Negotiate agreement with property owner
e) Obtain appropriate Municipal approval for acquisition of property
f) Present an Agreement of Purchase and Sale to property owner
g) Conduct any required survey work and due diligence for the property
h) Close on the property acquisition

The Town will pay for all costs of acquiring the property and easements for its purposes, including the cost of the appraisal of the property, compensation related to the land, survey costs, and reasonable closing fees.

9.5.1 Official Plan

The Town of Essex has an Official Plan that was adopted in 2009 and zoning by-laws that regulate and control development and planning policies in the service area. These documents are revised from time to time as necessary to take into account physical and social changes affecting the Town.

Based on the Official Plan and zoning by-laws, the study area consists of mainly three zones including mostly residential districts, a wetland district, very few commercial districts and a development reserve district which is the proposed location of the new development.

9.5.2 Zoning By-Law

The proposed site location on Lot 83, Concession 1 in the Town of Essex is zoned HR1.1, 'Holding Residential District 1.1' under Zoning By-law 1037, Schedule "A" – Zoning Map 16. As per the Town of Essex Zoning By-law 1037, 8.13 Holding Zone Restrictions,

a) Where the prefix "H" precedes any zoning district symbol in the Schedule "A" to this by-law, no use, building or other structure shall be permitted except:

i) any use, building or other structure erected, operated, or maintained by the Town, a public authority or a public utility;

ii) an existing use, building or structure, provided such use, building or structure is permitted by the applicable zoning district which the "H" prefix precedes; and

iii) additions or alterations to such existing buildings or structures and the erection of accessory buildings, all in accordance with the regulations of the applicable zoning district in which the lot is located and all other applicable regulations of this by-law.

Since the proposed wastewater treatment facility, a public utility, will be erected, operated, and maintained by the Town, construction of this facility is permitted in zoning district HR1.1 under zoning by-law 1037.

9.6 PERMITTING CONSIDERATIONS

9.6.1 Essex Region Conservation Authority

Development within the ERCA Regulation Limit is subject to the policies outlined in Ontario Regulation 158/06 under the *Conservation Authorities Act.* Regulated areas are present on the Site, including areas associated with the wetland, watercourse, and floodplains. Prior to any new development in regulated areas, including the placement or removal of fill material, grading activities, and the erection of any buildings or structures, and/or the alteration of regulated features, written approval (i.e., a Permit or a Letter of Permission) will be required from ERCA. Consultation with ERCA is recommended to determine permitting requirements.

9.6.2 Ministry of Environment, Conservation and Parks

The provincial ESA prohibits the killing, harming, harassing, capturing, or taking of a living member of a species listed as Threatened, Endangered or Extirpated by the Species at Risk in Ontario (SARO) list (O.Reg 230/08) (S.9), or the damage to habitat of similarly designated species (S.10). An exception is where a permit is issued under S.17(2) of the same act, or the Activity is registered under Ontario Regulation 242/08.

Based on preliminary assessment, impacts to SAR and/or SAR habitat may occur due to the Project. As such, targeted surveys to determine the presence/absence of SAR are recommended for the Study Area Refer to Section 6.4 of the Natural Heritage Impact Asssesment Report in **Appendix E**.

9.6.3 Ministry of Citizenship and Multiculturalism

Archaeological assessment(s) are required for areas of archaeological potential. The Stage 1 Archaeological Assessment report was entered into the Ontario Public Register of Archaeological Reports as of October 18th, 2023. The Stage 1 Archaeological Assessment identified that a Stage 2 Archaeological Assessment is required for any portion of the project's anticipated construction activities which impact an area of archaeological potential, refer to the Stage 1 Archaeological Assessment report in **Appendix E** for the complete and detailed recommendations.

Archaeological concerns have not been addressed until the Ministry of Citizenship and Multiculturalism's has provided its letter indicating that all reports have been entered into the Ontario Public Register of Archaeological Reports and those reports recommend that:

- the archaeological assessment of the project area is complete and
- all archaeological sites identified by the assessment are either of no further cultural heritage value or interest (as per Section 48(3) of the Ontario Heritage Act) or that mitigation of impacts has been accomplished through an avoidance and protection strategy.

9.6.4 Fisheries and Oceans Canada

The *Fisheries Act* prohibits causing the death of fish and the harmful alteration, disruption, or destruction (HADD) of fish habitat, unless authorized by the Minister of Fisheries, Oceans, and the Canadian Coast Guard. This applies to work being conducted in waters that support fish and fish habitat. The fish and fish habitat protection provisions of the *Fisheries Act* apply to all fish and fish habitat in Canada.

Following guidance and criteria provided on the Department of Fisheries and Oceans' (DFO's) website regarding mitigation, waterbody types and codes of practice, proponents determine whether their projects in or near water will require review by DFO. In cases where impacts to fish and fish habitat cannot be avoided, proponents submit a Request for Review form to DFO. DFO will review the project to identify the potential risks of the project to the conservation and protection of fish and fish habitat and will work with the proponent to provide advice and guidance on how to comply with the *Fisheries Act*. If the Project can avoid impacts to fish and fish habitat, project approval is not required. If impacts cannot be avoided, proponents

must apply for a *Fisheries Act* Authorization, and may be required to develop a habitat offsetting or compensation plan.

Details of the proposed infrastructure location will be assessed to determine the need for review by DFO; however, if in-water work is not proposed, DFO review under the *Fisheries Act* will not likely be required.

If the need for in-water work is identified, design details and construction methods will need to be reviewed to determine if the Project should be reviewed by DFO under the *Fisheries Act* through the submission of a Request for Review form.

10.0 CONSULTATION

The Municipal Class Environmental Assessment process provides a minimum of three points of contact for a Schedule C undertaking where members of the public and review agencies have the opportunity to review the project findings and submit comments for consideration in development of the project. The following sections summarize the approach that has been taken with respect to public participation during this project.

10.1 PUBLIC PARTICIPATION

A notice of commencement was originally published in the August 16th, 2022, edition of the Harrow News and on the Town of Essex's project webpage advising of the initiation of this Class EA undertaking and inviting public input. A copy of the notice is contained in **Appendix D**.

In addition to this discretionary point of contact, there are three points for mandatory public contact during the Class EA process, namely:

- Phase 2: Public Consultation and Information Centre No. 1
- Phase 3: Public Consultation and Information Centre No. 2
- Phase 4: Notice of Completion

A public Open House was held on October 26th, 2022, to provide information regarding this undertaking and to invite input and comment from interested persons. Information on alternative solutions selected in Phase 2 of the Class EA process was available for review. The open house notice was published in the October 18th, 2022, edition of the Harrow News and on the Town of Essex's project webpage. A copy of the notice and the Harrow News advertisement is contained in **Appendix D** along with a list of persons who attended the open house and a copy of the material that was given to all attendees.

A second public Open House was held on March 22nd, 2023, to review progress made since the first open house. Information on alternative concepts for the preferred design selected in Phase 3 of the Class EA process was available for review. The open house notice was published in the March 14th, 2023, edition of the Harrow News and on the Town of Essex's project webpage. A copy of the notice and the Harrow News advertisement is contained in **Appendix D** along with a list of persons who attended the open house and a copy of the material that was given to all attendees.

10.2 REVIEW AGENCIES

The Class EA provides for the involvement in the project by the MECP's various branches as well as other provincial and federal ministries and outside agencies. The list of Review Agencies varies depending upon the scope of the project, its location, and the potential environmental impacts.

Emails were sent out to review agencies the week of August 15th, 2022, advising of the initiation of this project. Copies of the letter, notice of project commencement and the list of review agencies are contained in **Appendix D**.

The Notice of Public Information Centre No.1 was distributed to review agencies and mandatory contacts October 17th and 18th, 2022. A copy of the email, the notice and the distribution list are included in **Appendix D**.

The Notice of Public Information Centre No.2 was distributed to review agencies and mandatory contacts March 9th, 2023. A copy of the email, the notice and the distribution list are included in **Appendix D**.

The Notice of Draft Environmental Study Report with instructions to access an electronic copy of the draft report was emailed to review agencies and Indigenous communities May 30th, 2023. A copy of the email and the distribution list are included in **Appendix D**.

10.3 LOCAL RESIDENTS

The Class EA process provides an opportunity for the public to participate in the project and provide comments or input on the recommended design concepts. A letter soliciting public feedback as part of the Phase 2 Public Consultation period of this project and including a copy of the feedback form was delivered to owners of properties surrounding the Colchester South Sewage Works on November 8th, 2022. A copy of the mailout package is contained in **Appendix D**.

A letter advising of Public Information Centre No.2 and the notice including a copy of the feedback form was delivered to owners of properties surrounding the Colchester South Sewage Works on March 8th, 2023. Residents who provided their email at Public Information Centre No.1 were also notified by email on March 9th, 2023. A copy of the mailout package is contained in **Appendix D**.

10.4 RESPONSE FROM PUBLIC AND REVIEW AGENCIES

10.4.1 Notice of Project Commencement

The Notice of Project Commencement of the project did not generate any public response. The following responses (copies included in **Appendix D**) were received from review agencies and mandatory contacts.

- Ministry of the Environment, Conservation and Parks (MECP) – provided acknowledgement of Notice of Project Commencement on September 6th, 2022.
- Ministry of Tourism, Culture, and Sport (MTCS) – advised in a letter dated September 6th, 2022, of the cultural heritage screening process and the importance of consultation with Indigenous communities.
- Ministry of Transportation (MTO) – advised in an email dated September 28th, 2022, that the study area does not fall within the MTO Permit Control Area (PCA), and as such, MTO permits are not required. MTO would have concerns with any work that could potentially impact the highway or falls within the PCA.

- The Essex Region Conservation Authority (ERCA) – provided acknowledgement of Notice of Project Commencement and requested a map showing the study area boundaries in an email dated August 16th, 2022.
- Environment and Climate Change Canada (ECCC) – provided acknowledgement of Notice of Project Commencement on August 15th, 2022.
- Ministry of Municipal Affairs and Housing (MMAH) – provided acknowledgement of Notice of Project Commencement on August 15th, 2022.
- The Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) – provided a letter of acknowledgement of Notice of Project Commencement and information as a guide to identifying and assessing natural features and resources on August 18th, 2022.

10.4.2 Public Open House No.1

A total of fifteen (15) people attended the Open House held on October 26th, 2022.

The written comments (copies included in **Appendix D**) were received from the following review agencies and mandatory contacts.

- The Essex Region Conservation Authority (ERCA) – advised in a letter dated October 27th, 2022, that:
    - Portions of the existing service area contains lands which are subject to their Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation under the Conservation Authorities Act (Ontario Regulation No. 158/06), falling within the Limit of Regulated Area of Lake Erie. Any works within a regulated area will be required to obtain a Permit and/or Clearance from the Essex Region Conservation Authority prior to any construction or site alteration or other activities affected by Section 28 of the Conservation Authorities Act.
    - Portions of the study area fall within a Surface Water Intake Protection Zone, a Highly Vulnerable Aquifer, and a Significant Groundwater Recharge Area.
- Fisheries and Oceans Canada – advised in an email dated October 26th, 2022, that the project proponent is requested to self-assess if the project will interact with a federal property and/or waterway and require approval and/or authorization under any Acts.
- Environment and Climate Change Canada (ECCC) – provided acknowledgement of Notice of Project Commencement on October 18th, 2022.
- Ministry of Municipal Affairs and Housing (MMAH) – provided acknowledgement of Notice of Project Commencement on October 18th, 2022.

In addition, a total of nine (9) feedback forms were received from residents in response to the information provided at the Public Open House. The Town of Essex responded to resident's comments and concerns via email. Copies of the feedback forms and Town responses are included in **Appendix D**.

10.4.3 Public Open House No.2

A total of twenty-eight (28) people attended the Open House held on March 22nd, 2023.

No comments were received from review agencies or mandatory contacts.

In addition, a total of three (3) feedback forms were received from residents in response to the information provided at Public Open House No.2. The Town of Essex responded to resident's comments and concerns via email. Copies of the feedback forms and Town responses are included in **Appendix D**.

10.4.4 Notice of Draft Environmental Study Report

The following review agencies and contacts provided feedback on the 'Draft' ESR, (copies of their comments and responses are included in **Appendix D**):

- Ministry of Citizenship and Multiculturalism (MCM) – provided project review comments on June 14th, 2023.
- Ministry of the Environment, Conservation and Parks (MECP) – provided project review comments on June 27th, 2023.
- Kyle Edmunds, representing the developer of the Colchester Bay Development – responded via email with questions and comments on June 16th, 2023.

10.5 INDIGENOUS CONSULTATION

Consultation with Indigenous communities is ongoing in accordance with the Municipal Class EA Consultation requirements. As part of this Environmental Assessment, communications with Indigenous agencies and communities are being undertaken in parallel with the other stakeholder communications and consultations. This report will be sent to the Indigenous groups and organizations to solicit their interest or non-interest in the study.

The communities contacted as a part of this EA study include:

- Ministry of Indigenous Affairs
- Southern First Nations Secretariat
- Aamjiwnaang First Nation
- Caldwell First Nation
- Walpole Island First Nation (Bkejwanong Territory)
- Chippewas of the Thames First Nation
- Chippewas of Kettle & Stony Point First Nation
- Oneida Nation of the Thames (ONYOTA'A:KA)
- Métis Nation of Ontario, Thames Bluewater Métis Council
- Delaware Nation (Moravian of the Thames)

On August 11th, 2023, Caldwell First Nation provided their feedback on the 'Draft' ESR and the 'Draft' Stage 1 Archaeological Assessment report. The Stage 1 Archaeological Assessment report is included in **Appendix E.** Copies of Caldwell First Nation's feedback and responses are included in **Appendix D.**

Opinion of Probable Cost
October 23, 2023

On August 15th, 2023, Stantec presented the findings of this Environmental Study Report at the Aamjiwnaang First Nation's Environment Committee meeting as requested in order to provide meaningful participation in the consultation process. The Aamjiwnaang First Nation had no comments or concerns with the project.

Documentation of consultation with Indigenous communities during the Environmental Assessment Process is in **Appendix D**.

11.0 OPINION OF PROBABLE COST

This section discusses an opinion of probable cost for the preferred solution. The opinion of probable cost is an estimate of the future contract price for the engineering and construction work, which is not yet fully defined and may be subject to changes in scope, design, and market conditions.

11.1 LEVEL OF ACCURACY

Opinions of probable cost are typically provided throughout various stages of a project's life cycle. There are a number of classifications for estimates that identify typical minimum and maximum probable costs or levels of accuracy. These classifications vary widely by industry, but all are based on the fact that the level of accuracy is directly proportional to the level of detail available at each stage of the project.

The level of accuracy increases as the project moves through the various stages from planning to preliminary design to final design. A wide range of accuracy would be expected at the planning stage of a project development because a number of details would be unknown. As the project moves closer to completion of final design, the estimate would become more accurate due to the increased level of detail available and the reduced number of unknowns.

Table 10.1 includes a summary of typical estimate classifications used throughout a project's development including a description of the project stage and range of accuracy. The opinions of probable cost in this study are estimated at the study stage (Class 2) and the corresponding level of accuracy could range from –15% to +30% from the opinion presented in the report.

Table 11.1: Classification of Cost Estimates

Class	Description	Level of Accuracy	Stage of Project Lifecycle
1	Conceptual Estimate	+50% to -30%	Screening of alternatives.
2	Study Estimate	+30% to -15%	Treatment system master plans.
3	Preliminary Estimate	+25% to -10%	Pre-design report.
4	Detailed Estimate	+15% to -5%	Completed plans and specifications.
5	Tender Estimate	+10% to -3%	This is the actual tender price and it can vary depending on the amount of contingency allowance consumed.

11.2 OPINION OF PROBABLE COST FOR PREFERRED SOLUTION

A capital budget estimate (in 2023 dollars) is summarized in **Table 10.2**. In addition to the level of accuracy discussed, the opinion of probable cost was prepared taking into consideration the following factors.

- All estimates are in 2023 dollars based on an Engineering News Record (ENR) Construction Cost Index of 1200.
- It is assumed that the Contractor will have unrestricted access to the site and will complete the work during normal working hours from 7:00 am to 6:00 pm Monday to Friday. There is no allowance for premium time included. Labour costs are based on union labour rates for the Windsor area.
- An allowance is included for mobilization and demobilization and the Contractor's overhead and profit.
- Equipment costs are based on vendor supplied price quotations and historical pricing of similar equipment.
- Bulk material and equipment rental costs used are typical for the Windsor area.
- The estimate does not include the cost of application or permit fees.
- No allowance is included for escalation beyond the date of this report.
- A factor that could impact the estimate is the possible presence of archaeological resources in the construction area. However, the potential for these resources has been identified to be low and therefore no allowance is included in the estimate.
- For more detailed regarding the opinion of probable cost for pumping station No.'s 2, 3, 5, 6, and 7 refer to **Section 5.2.5**.

Table 11.2: Opinion of Probable Capital Cost for Preferred Solution

Item	Description	Probable Cost
1	Pumping Station No. 1 Upgrades	$1,600,000
2	Pumping Station No.'s 2, 3, 5, 6, and 7 Upgrades	$3,000,000
3	Wastewater Treatment Facility • Screening and Grit Building • Blower Building • SBR (Three Tanks) • Aerated Sludge Holding Tank (Two Tanks) • U.V. Disinfection Building	$24,000,000
	Sub-total Construction Cost	$28,600,000
	Contingency Allowance (30%)	$8,600,000
	Engineering Allowance (15%)	$5,600,000
	TOTAL CAPITAL COST (excluding taxes)	$42,800,000

12.0 SUMMARY

This ESR presents a thorough review and evaluation of alternative design solution and concepts for the Colchester South Sewage Works. This ESR identified, evaluated, and reported on alternative design solutions and concepts to determine the recommended long-term design to accommodate increased wastewater servicing demands in the Colchester South community. **Section 4.0** summarizes the decision-making process and outcomes of the analysis for each design solution. **Section 6.0** and **Section 7.0** summarize the decision-making process and outcomes of the analysis for various design concepts.

The most preferred alternative and therefore the recommended solution was determined to be expanding the existing service area and upgrading the Colchester Sewage Works. This solution will provide a capacity that will accommodate the existing community and future population growth in the Colchester South service area. Benefits of this solution include that it would require less complex construction and O&M requirements, has a flexible implementation timeline, and can be adjusted to meet the needs of the community as a whole. In terms of the social and natural environment, this solution is a part of the original system design and is a planned requirement for the Colchester South Sewage Works. Increasing development pressures would necessitate these planned upgrades earlier than originally expected. The proposed expansions and upgrades will be designed in accordance with MECP Design Guidelines for Sewage Works which would mitigate potential negative impacts to the community and/or natural environment. In addition, the upgrade should incorporate a treatment process that will satisfy more stringent MECP effluent quality criteria for discharge into Lake Erie.

Sequencing Batch Reactor was identified as the preferred treatment technology because it is proven to generate good effluent quality within a moderate footprint at a moderate capital and O&M cost. SBR is the only alternative which is expected to meet MECP effluent criteria without the use of pretreatment or external clarification resulting in relatively simple constructability and expansion. In addition, SBR is adaptable more adaptable to variations in influent flow. This technology is consistent with that used at the nearby Essex Pollution Control Plant, which is beneficial as both plants are operated by OCWA who is familiar with the operations and maintenance requirements of this technology. In terms of the impact on the social and natural environment, this treatment technology would have a low potential for odour, noise, and vibrations which will allow the facility to meet MECP Design Guidelines for offsite emissions. Further, this treatment technology would produce acceptable effluent quality reducing potential impacts to the aquatic life in Lake Erie.

Trucking liquid sludge from the Colchester South Wastewater Treatment Facility to the Essex PCP was identified at the preferred biosolids management strategy. Benefits of this strategy include lower footprint requirements at the Colchester South Facility, no construction requirements, less complex O&M requirements, and lower capital cost. Construction of an onsite dewatering facility should be reconsidered when major upgrades are being assessed at either facility.

When capital budget funding becomes available, it is recommended that the work described in this ESR proceed to Phase 5 (final design and construction). Implementation of the proposed works would allow the Colchester South Sewage Works to accommodate additional development within the community. These developments have the potential to generate socio-economic and environmental benefits for the community.

APPENDICES

APPENDIX A: FIGURES

Figure 1.1: Municipal Class EA Planning and Design Process 2022

Figure 1.2: Colchester South Sanitary Service Area

Figure 2.1: Colchester South Sanitary Service Area - Pumping Station Locations

Figure 5.1: Proposed Developments in Colchester South

Figure 5.2: Sewer Capacity Rendering from Existing Development

Figure 5.3: Sewer Capacity Rendering from Ultimate Development within Existing Service Area

Figure 5.4: Sewer Capacity Rendering from Ultimate Development within Existing Service Area and Colchester Bay Development Phase 1 (Single Outlet)

Figure 5.5: Sewer Capacity Rendering from Ultimate Development within Existing Service Area and Colchester Bay Development Phase 1 (Multiple Outlets)

Figure 5.6: Sewer Capacity Rendering from Ultimate Development within Existing Service Area and Colchester Bay Development Phase 1 and 2 (Single Outlet)

Figure 5.7: Sewer Capacity Rendering from Ultimate Development within Existing Service Area and Colchester Bay Development Phase 1 and 2 (Multiple Outlets)

Figure 8.1: Proposed Site Plan

Figure 8.2: Proposed Colchester South Sewage Works Process Schematic

Figure 8.3: Proposed Preliminary Treatment Phasing

Figure 8.4: Proposed Biological Treatment Phasing

Figure 8.5: Proposed Disinfection Phasing

Figure 9.1: Map 11 of Essex Region Source Protection Plan

Figure 9.2: Map 4 of Essex Region Source Protection Plan

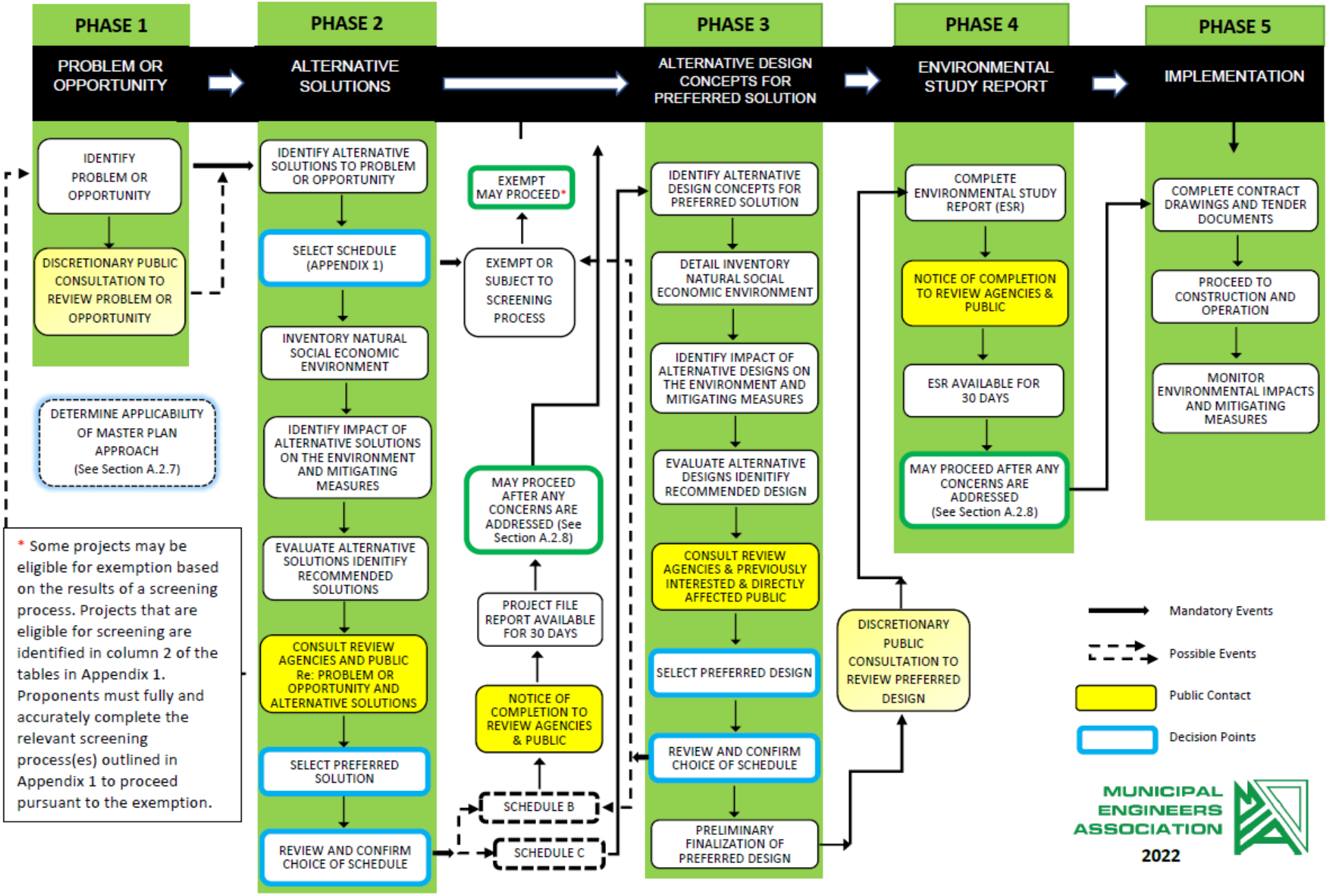
Figure 9.3: Map 5 of Essex Region Source Protection Plan

Figure 9.4: Study Area for Proposed Work Site

Figure 9.5: Lypps Beach Provincially Significant Wetland

EXHIBIT A.2. MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the MCEA





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Stantec

Legend

- Wastewater Treatment Lagoons
- Existing Service Area

Proposed Service Area Expansion

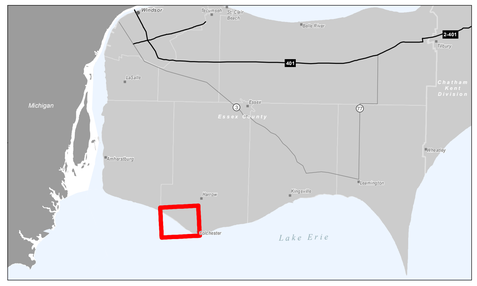
- Expanded Service Area
- Expanded Service & Settlement Area

0 700 1,400 metres

1:9,918 (At original document size of 22x34)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Orthoimagery © First Base Solutions, 2018. Imagery Date, 2019.
4. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018. Elevations from SWOOP 2015 Digital Elevation Model.



Prepared by HR on 2023-04-04
165620266 REVA

Project Location
Colchester

Client/Project
Town of Essex, Colchester South Sewage Works Expansion

Figure No.
1.2

Title
Colchester South Sanitary Service Area

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Hillcrest Blvd
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Erie Shores

Erie Blue

Wellesley Drive

Colchester Heights

Lypps Beach

Colchester Bay - Phase 1

Colchester Bay - Phase 2

The Grove Motel

Erie Blue Dr

Everglade Lane

Erie Shores Dr

Cedarwood Rd

Cedarwood Crescent

Cedarwood Dr

Cedarwood Place

Cedarwood Lane

Cedarwood Court

Cedarwood Ct

Cedarwood Cir

Cedarwood Pl

Cedarwood Terrace

Cedarwood Way

Cedarwood Gate

Cedarwood Blvd

Cedarwood Trail

Cedarwood Path

Cedarwood Square

Cedarwood Loop

Cedarwood Run

Cedarwood Walk

Cedarwood Alley

Cedarwood Parkway

Cedarwood Circle

Cedarwood Heights

Cedarwood Meadows

Cedarwood Valley

Cedarwood Ridge

Cedarwood Hill

Cedarwood Grove

Cedarwood Park

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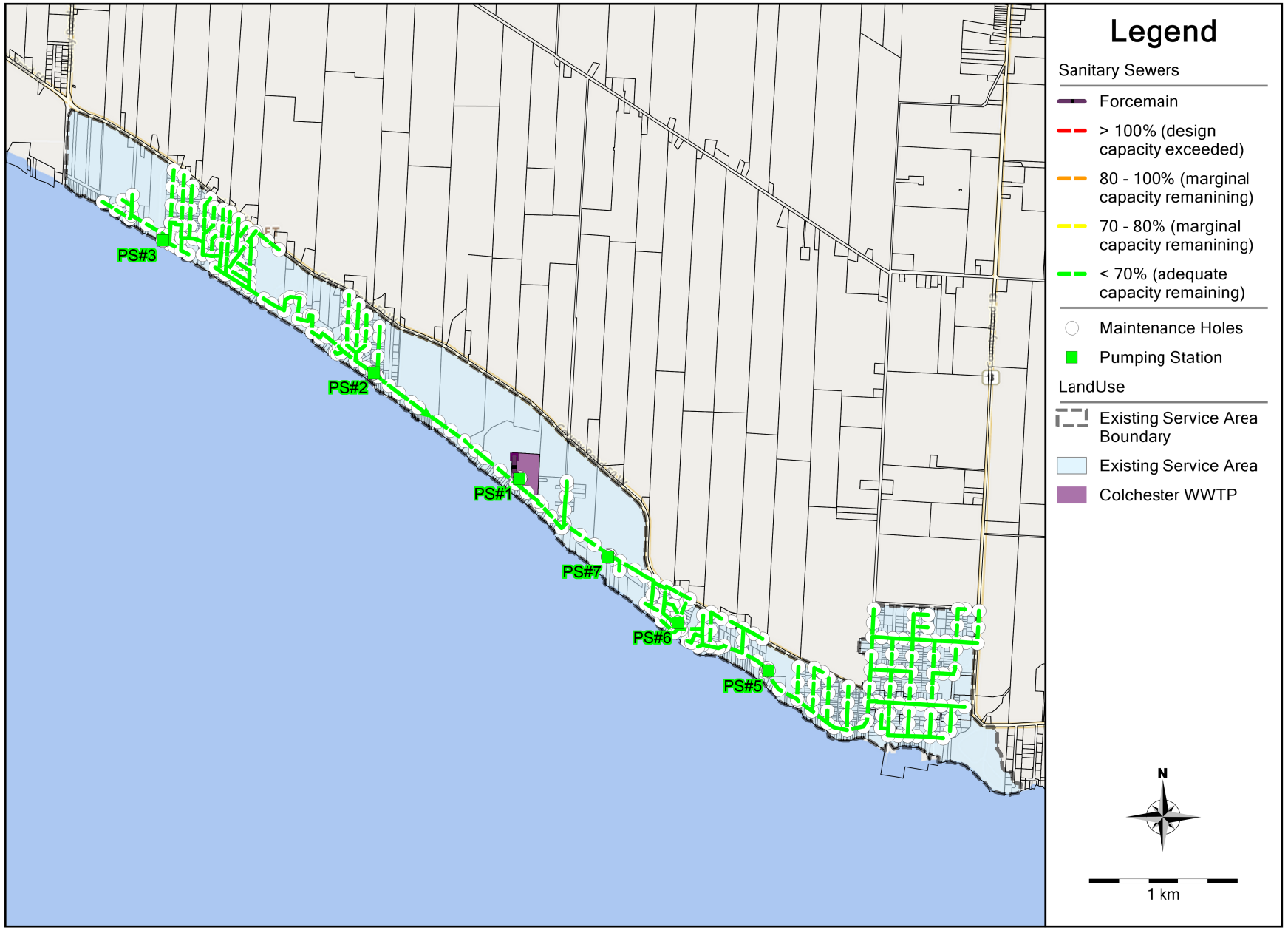


Figure 5.2: Sewer Capacity Rendering from Existing Development

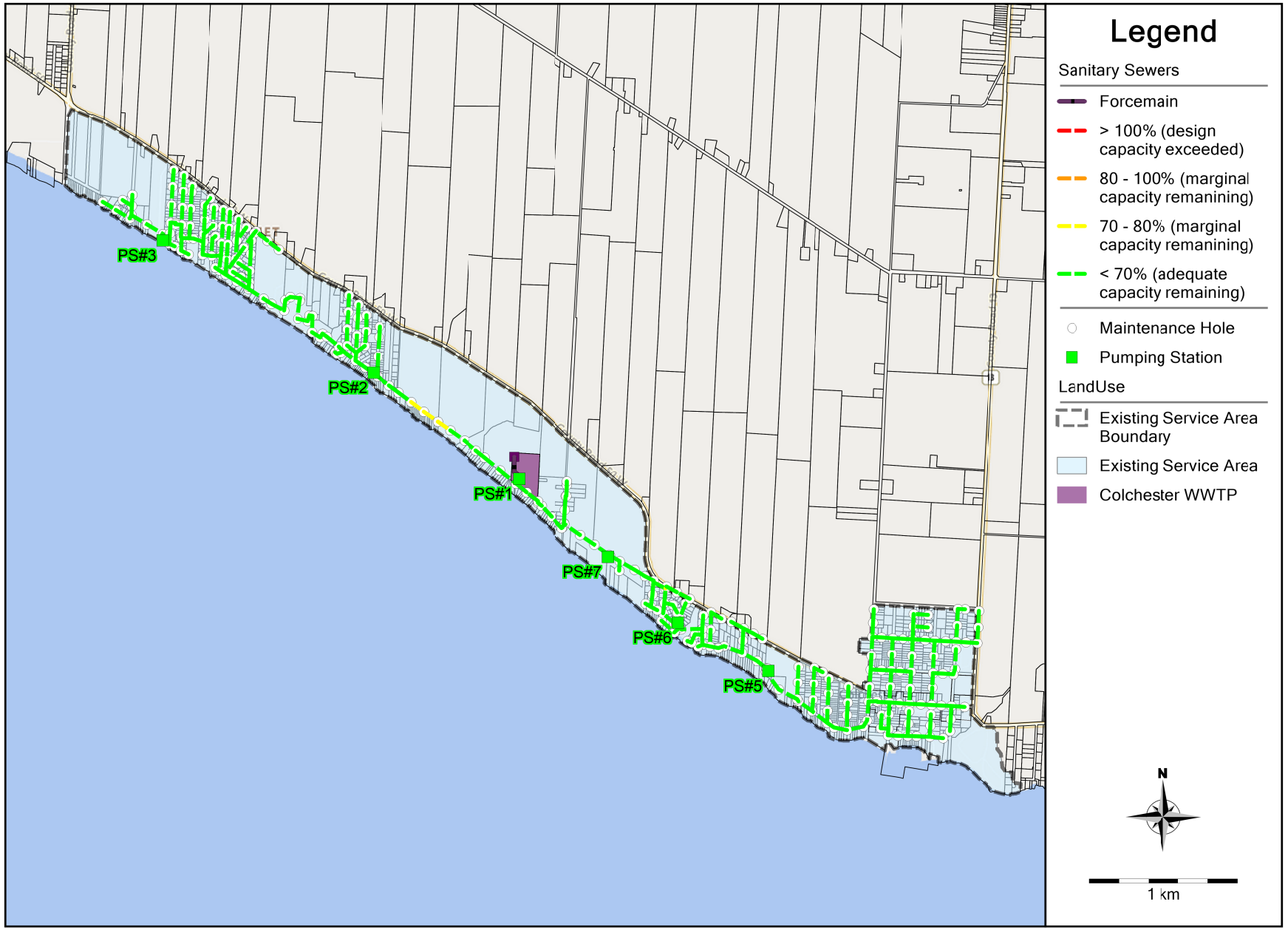


Figure 5.3: Sewer Capacity Rendering from Ultimate Development within Existing Service Area

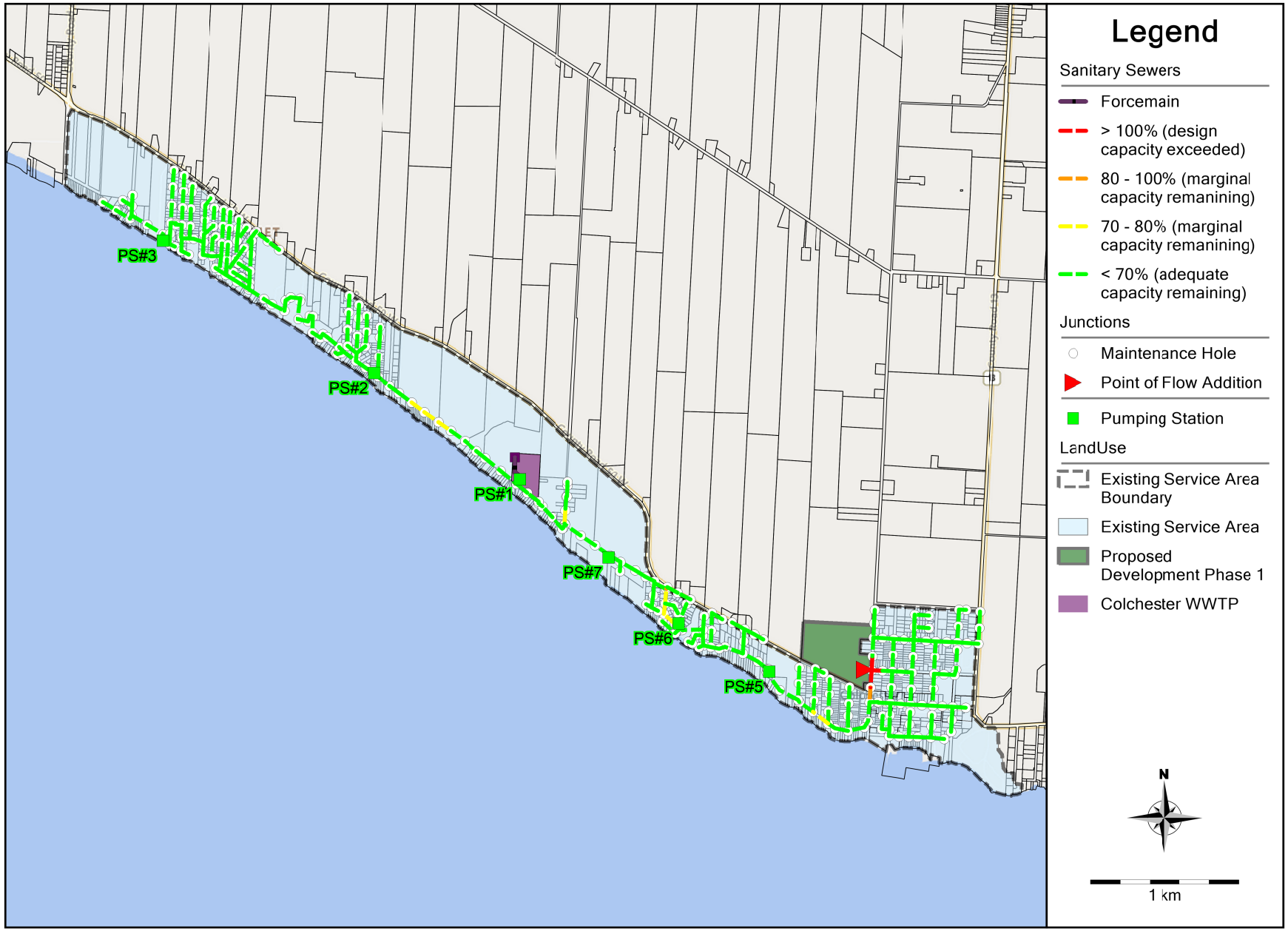


Figure 5.4: Sewer Capacity Rendering from Ultimate Development within Existing Service Area and Colchester Bay Development Phase 1 (Single Outlet)

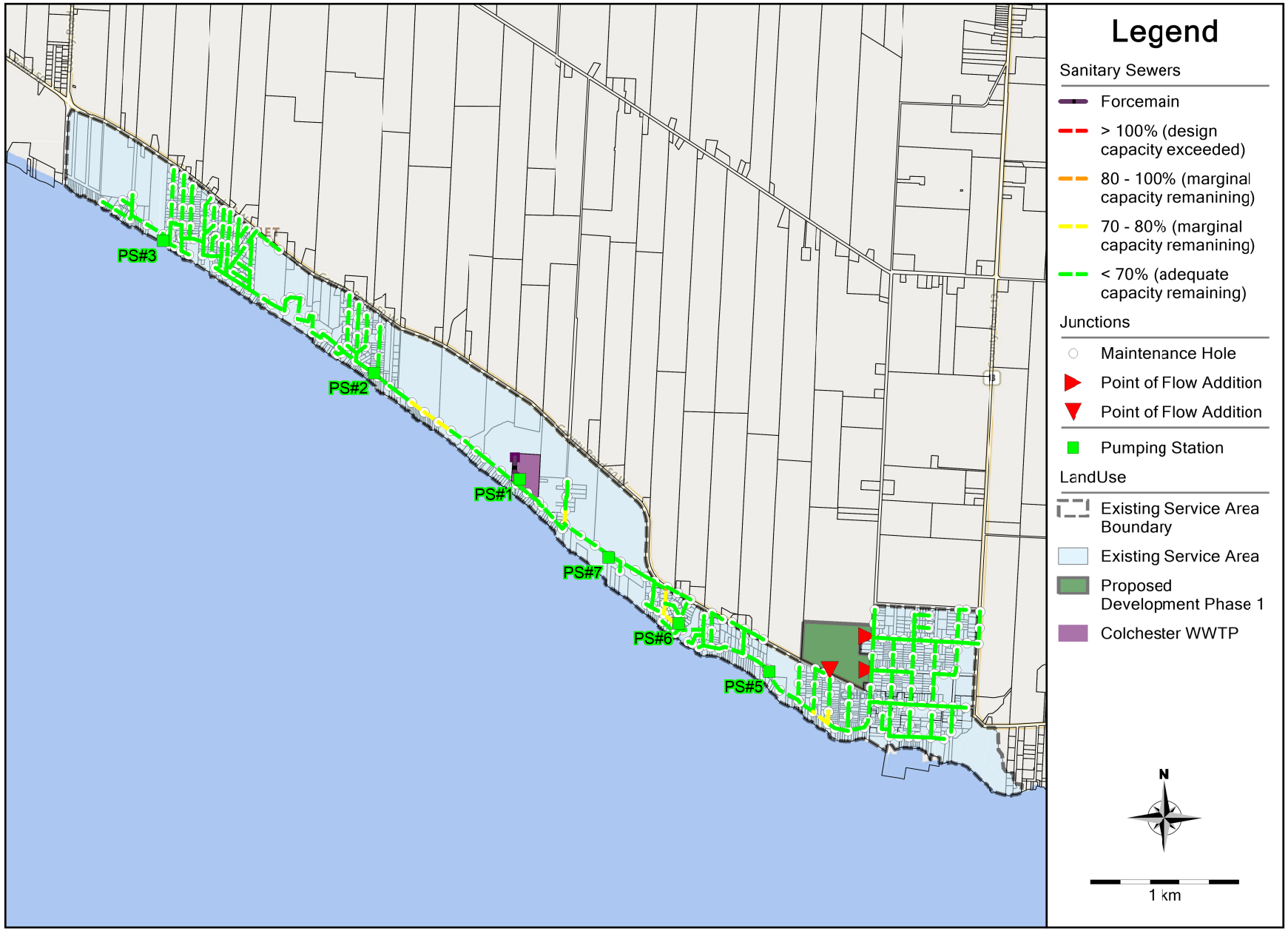


Figure 5.5: Sewer Capacity Rendering from Ultimate Development within Existing Service Area and Colchester Bay Development Phase 1 (Multiple Outlets)

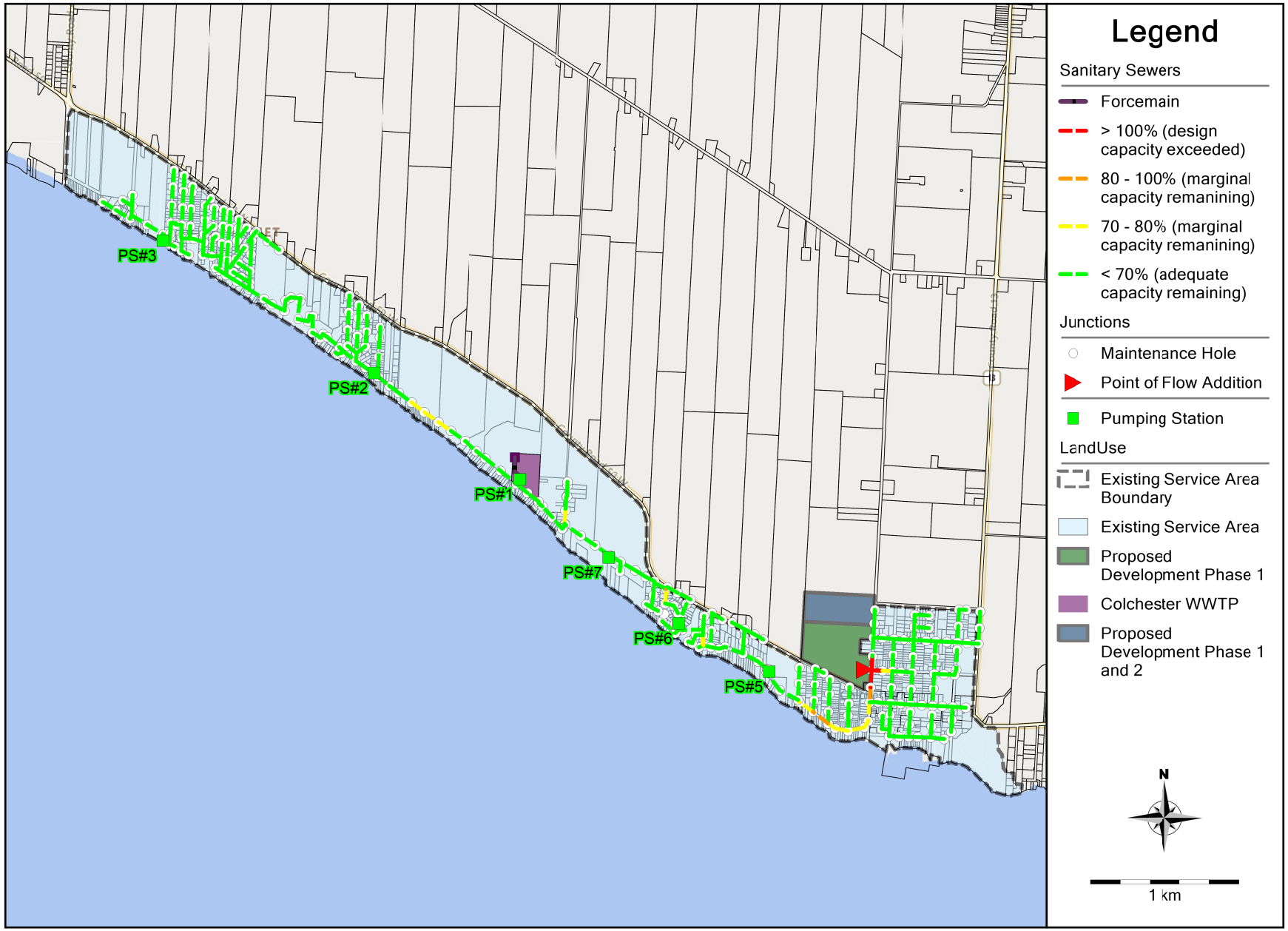


Figure 5.6: Sewer Capacity Rendering from Ultimate Development within Existing Service Area and Colchester Bay Development Phase 1 and 2 (Single Outlet)

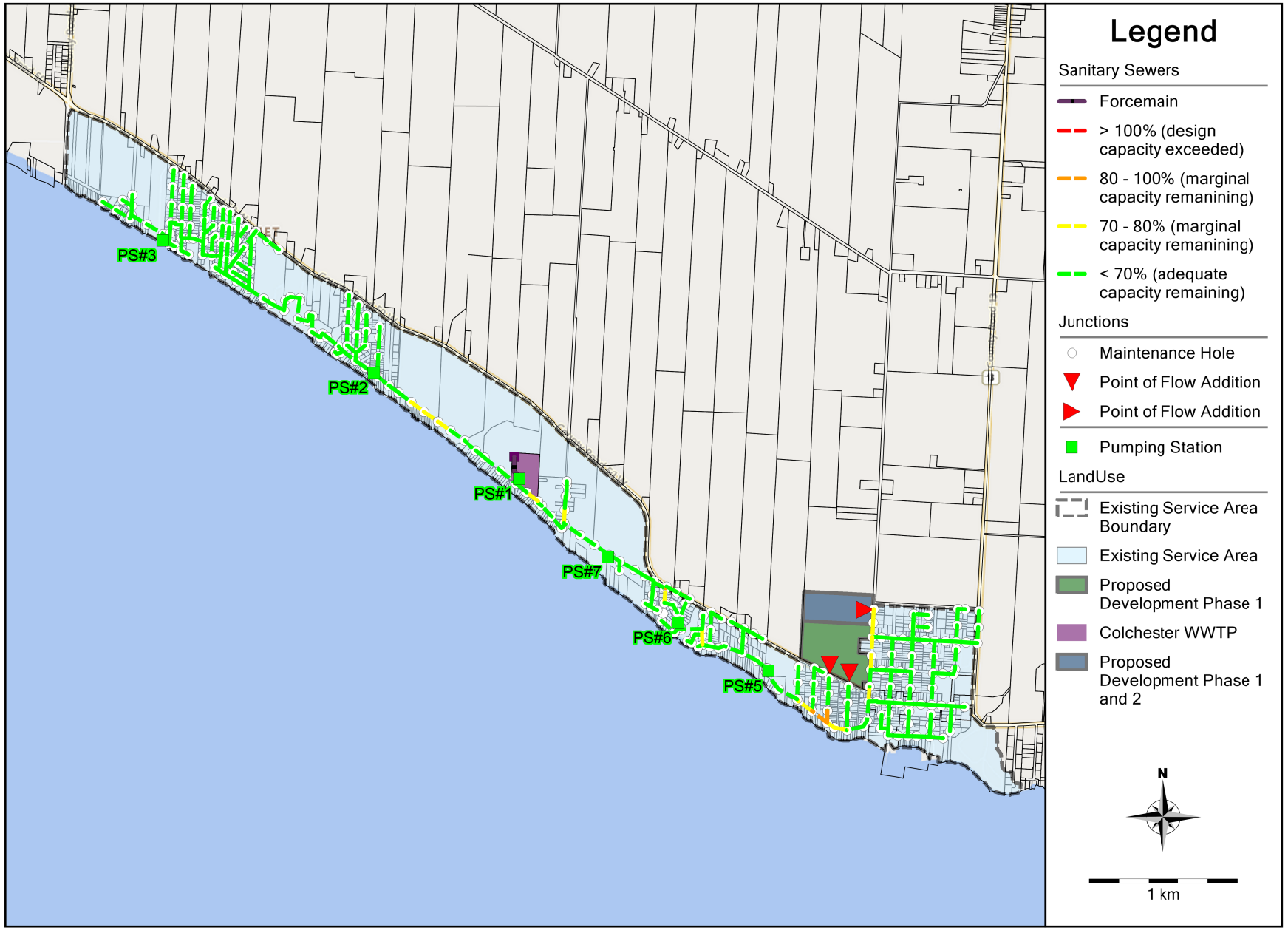
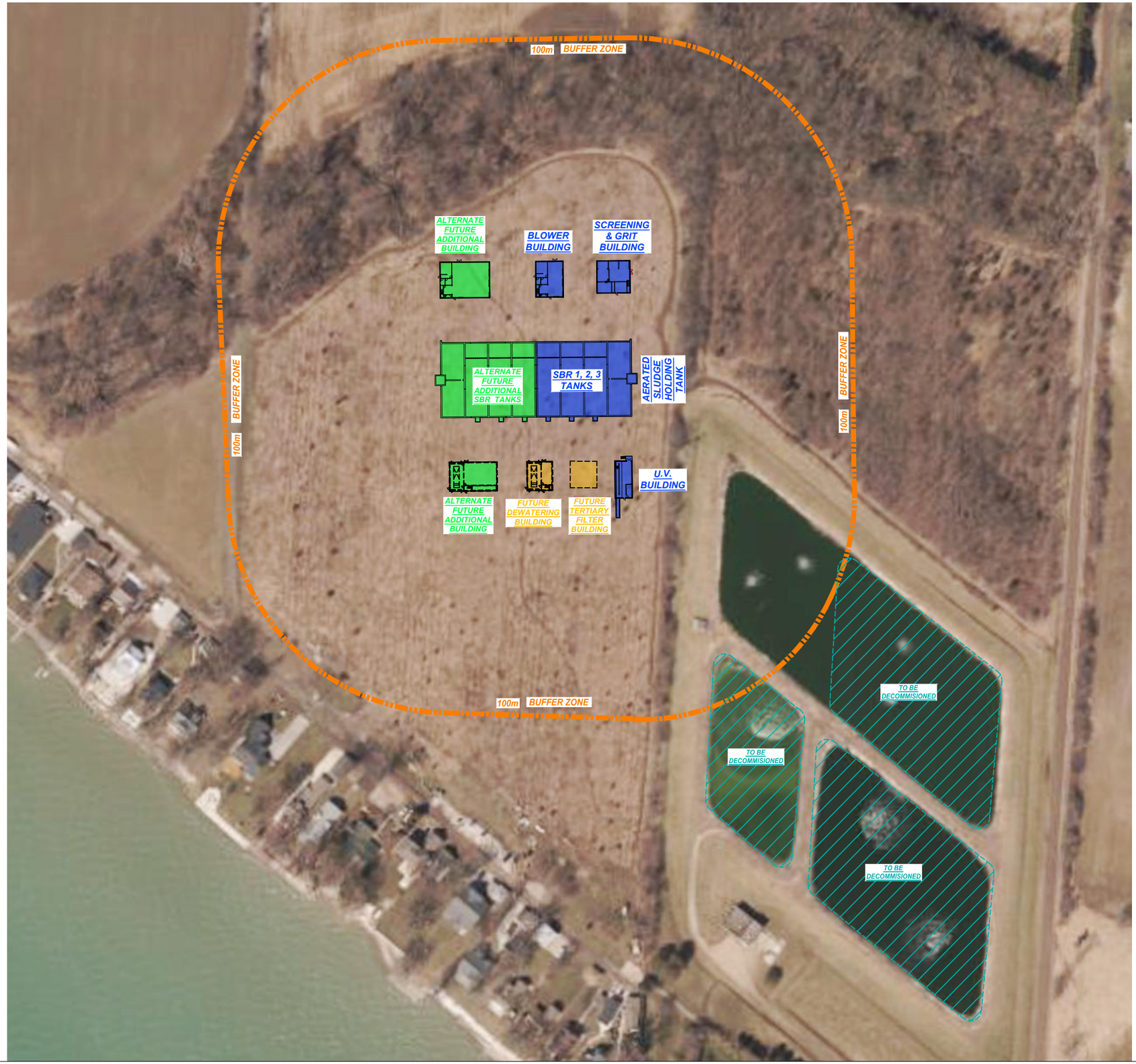


Figure 5.7: Sewer Capacity Rendering from Ultimate Development within Existing Service Area and Colchester Bay Development Phase 1 and 2 (Multiple Outlets)



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Legend

- 20 YEAR DESIGN
- ULTIMATE DESIGN
- FUTURE

Notes

Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD

File Name: 165620266_FIG-8.1

Dwn.	Chkd.	Dsgn.	2023. YY.MM.DD

Permit/Seal

Client/Project
TOWN OF ESSEX

COLCHESTER SOUTH WASTEWATER TREATMENT FACILITY
CLASS ENVIRONMENTAL ASSESSMENT
Town of Essex, Ontario

Title
PROPOSED SITE PLAN

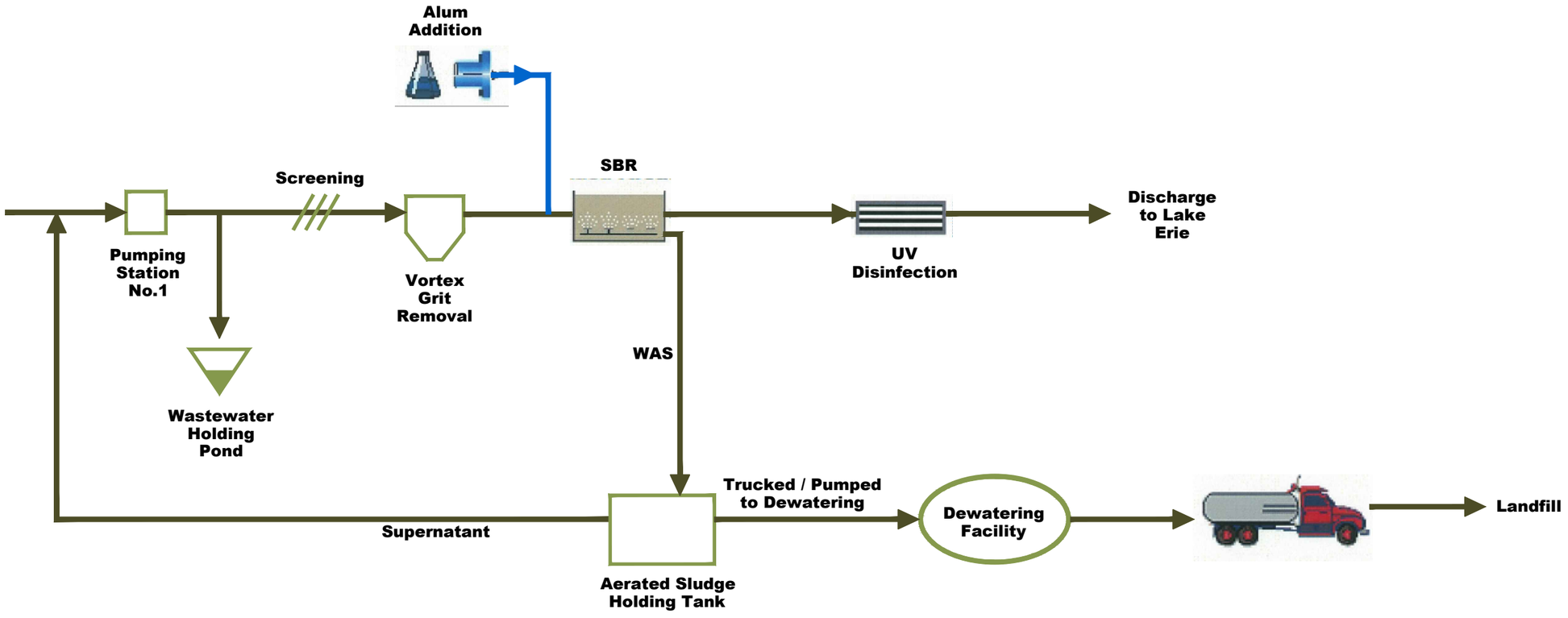
Project No.
165620266

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Revision

Drawing No.
FIGURE 8.1

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2023-5-08 10:12am BY: qhio



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Issued	By	Appd.	YY.MM.DD

File Name: 165620266_FIG-8.2 — Dwn. — Chkd. — Dsgn. — 2023. YY.MM.DD

Permit/Seal

Client/Project
TOWN OF ESSEX

COLCHESTER SOUTH WASTEWATER TREATMENT FACILITY
CLASS ENVIRONMENTAL ASSESSMENT
Town of Essex, Ontario

Title
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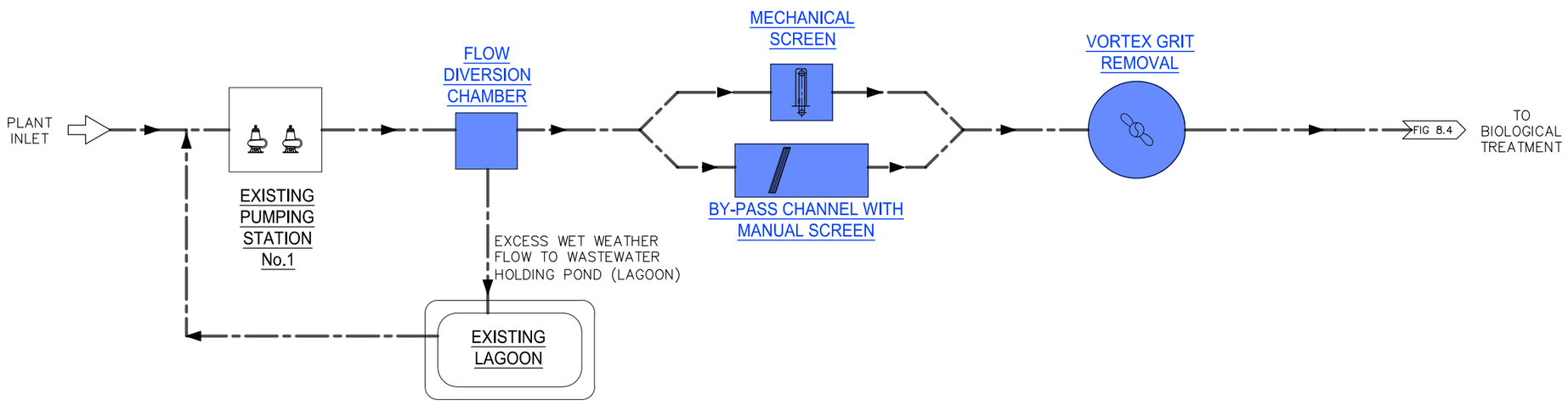
Project No. 165620266 — Scale

Revision — Drawing No.

FIGURE 8.2

\\CA0223-PPFSS01\work_group\01656\active\165620266\planning\drawing\general\165620266_FIG-8.2.dwg
2023-5-08 09:56am BY: qkha

PHASES	DESIGN FLOW	PEAK FLOW	PROPOSED TREATMENT FACILITIES
EXISTING	1,816m^3/d	8,122m^3/d	PUMPING STATION
20 YEAR DESIGN	3,700m^3/d	16,900m^3/d	1 MECHANICAL CLEANED SCREEN 1 MANUALLY CLEANED BAR SCREEN 1 VORTEX GRIT SYSTEM
ULTIMATE DESIGN	7,500m^3/d	32,800m^3/d	NO CHANGES NEEDED



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Legend

- EXISTING
- 20 YEAR DESIGN
- ULTIMATE DESIGN

Notes

Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD

File Name: 165620266_FIG-8.3 — Dwn. — Chkd. — Dsgn. — 2023. YY.MM.DD

Permit/Seal

Client/Project
TOWN OF ESSEX

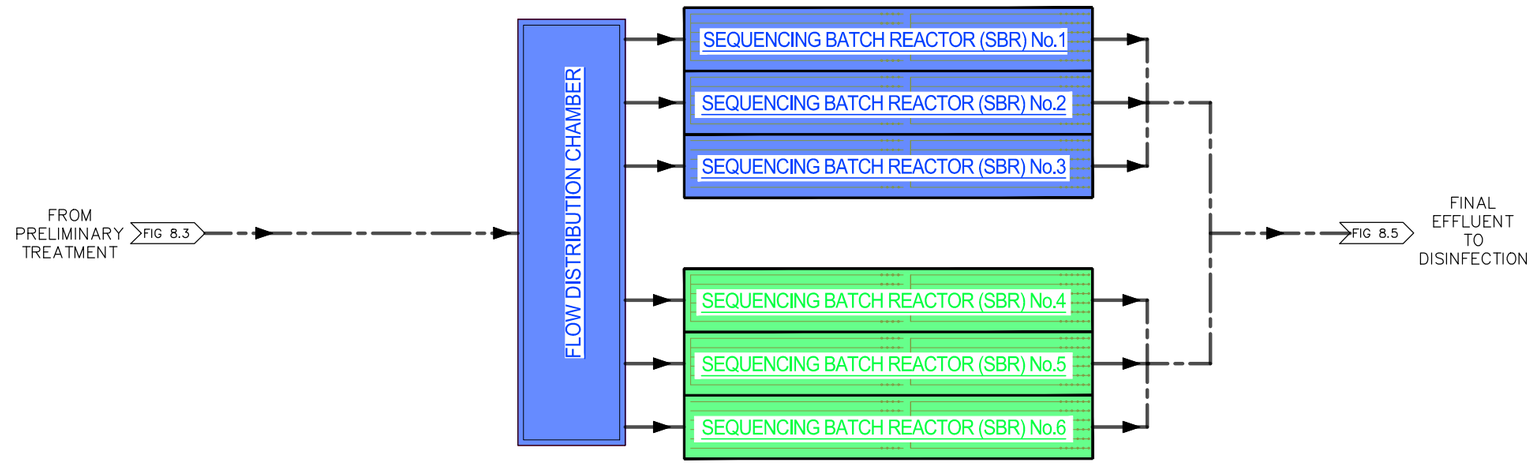
COLCHESTER SOUTH WASTEWATER TREATMENT FACILITY
CLASS ENVIRONMENTAL ASSESSMENT
Town of Essex, Ontario

Title
PROPOSED PRELIMINARY TREATMENT PHASING

Project No. 165620266
Scale
Revision
Drawing No.
FIGURE 8.3

\\CA0223-PPFSS01\work_group\01656\active\165620266\planning\drawing\general\165620266_FIG-8.3.dwg
2023-5-08 10:41 am BY: qkha

PHASES	DESIGN FLOW	PEAK FLOW	PROPOSED TREATMENT FACILITIES
EXISTING	1,816m^3/d	8,122m^3/d	LAGOON CELLS No.1, 2 & 3
20 YEAR DESIGN	3,700m^3/d	16,900m^3/d	ADD THREE SBRs
ULTIMATE DESIGN	7,500m^3/d	32,800m^3/d	ADD THREE SBRs



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Legend

EXISTING
20 YEAR DESIGN
ULTIMATE DESIGN

Notes

Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD

File Name: 165620266_FIG-8.4 — Dwn. — Chkd. — Dsgn. — 2023. YY.MM.DD

Permit/Seal

Client/Project
TOWN OF ESSEX

COLCHESTER SOUTH WASTEWATER TREATMENT FACILITY
CLASS ENVIRONMENTAL ASSESSMENT
Town of Essex, Ontario

Title
PROPOSED BIOLOGICAL TREATMENT PHASING

Project No.
165620266

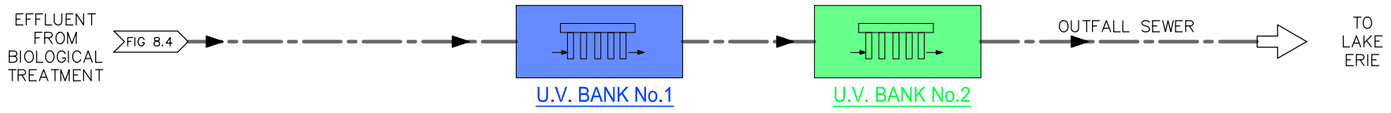
Scale

Revision

Drawing No.
FIGURE 8.4

\\CA0223-PFFS01\work_group\01656\active\165620266\planning\drawing\general\165620266_FIG-8.4.dwg
2023-5-08 10:26am BY: qkha

PHASES	DESIGN FLOW	PEAK FLOW	PROPOSED TREATMENT FACILITIES
EXISTING	1,816m^3/d	8,122m^3/d	NO DISINFECTION
20 YEAR DESIGN	3,700m^3/d	16,900m^3/d	CONSTRUCT A NEW U.V. FACILITY TO HANDLE 20 YEAR PEAK FLOW
ULTIMATE DESIGN	7,500m^3/d	32,800m^3/d	ADD U.V. BANK No.2 IN U.V. FACILITY



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EXISTING
20 YEAR DESIGN
ULTIMATE DESIGN

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Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD

File Name: 165620266_FIG-8.5

Dwn.	Chkd.	Dsgn.	2023. YY.MM.DD

Permit/Seal

Client/Project
TOWN OF ESSEX

COLCHESTER SOUTH WASTEWATER TREATMENT FACILITY
CLASS ENVIRONMENTAL ASSESSMENT
Town of Essex, Ontario

Title
PROPOSED DISINFECTION PHASING

Project No.
165620266

Scale

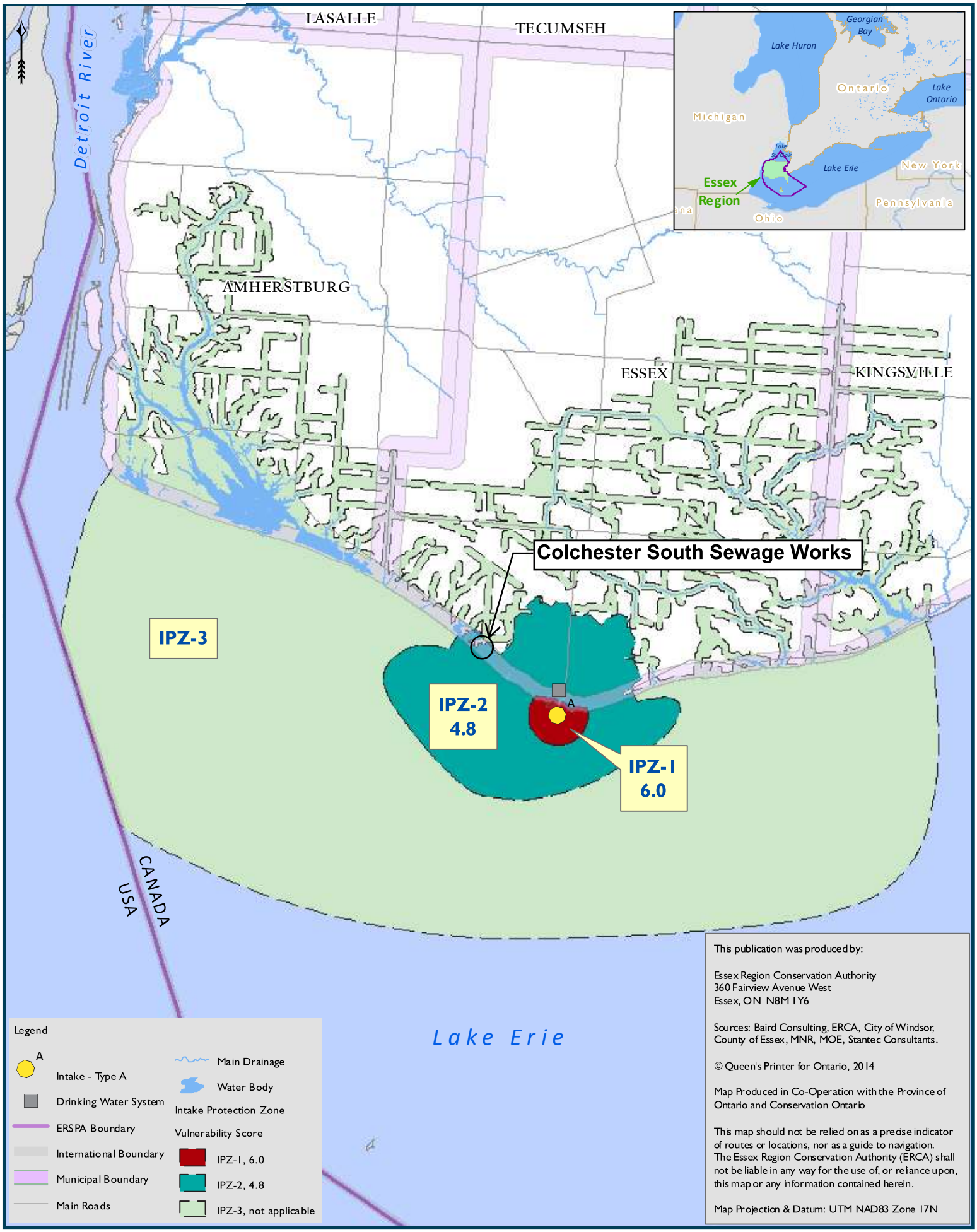
Revision

Drawing No.
FIGURE 8.5

\\CA0223-PPFSS01\work_group\01656\active\165620266\planning\drawing\general\165620266_FIG-8.5.dwg
2023-3-08 10:43am BY: qkha

Map 11: Harrow-Colchester South Water Treatment Plant IPZs and Vulnerability Scoring

Made possible through funding support from the Government of Ontario



Legend

- A — Intake - Type A
- Drinking Water System
- ERSPA Boundary
- International Boundary
- Municipal Boundary
- Main Roads
- Main Drainage
- Water Body

Intake Protection Zone

Vulnerability Score

- IPZ-1, 6.0
- IPZ-2, 4.8
- IPZ-3, not applicable

This publication was produced by:

Essex Region Conservation Authority
360 Fairview Avenue West
Essex, ON N8M 1Y6

Sources: Baird Consulting, ERCA, City of Windsor, County of Essex, MNR, MOE, Stantec Consultants.

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Map Produced in Co-Operation with the Province of Ontario and Conservation Ontario

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Map Projection & Datum: UTM NAD83 Zone 17N

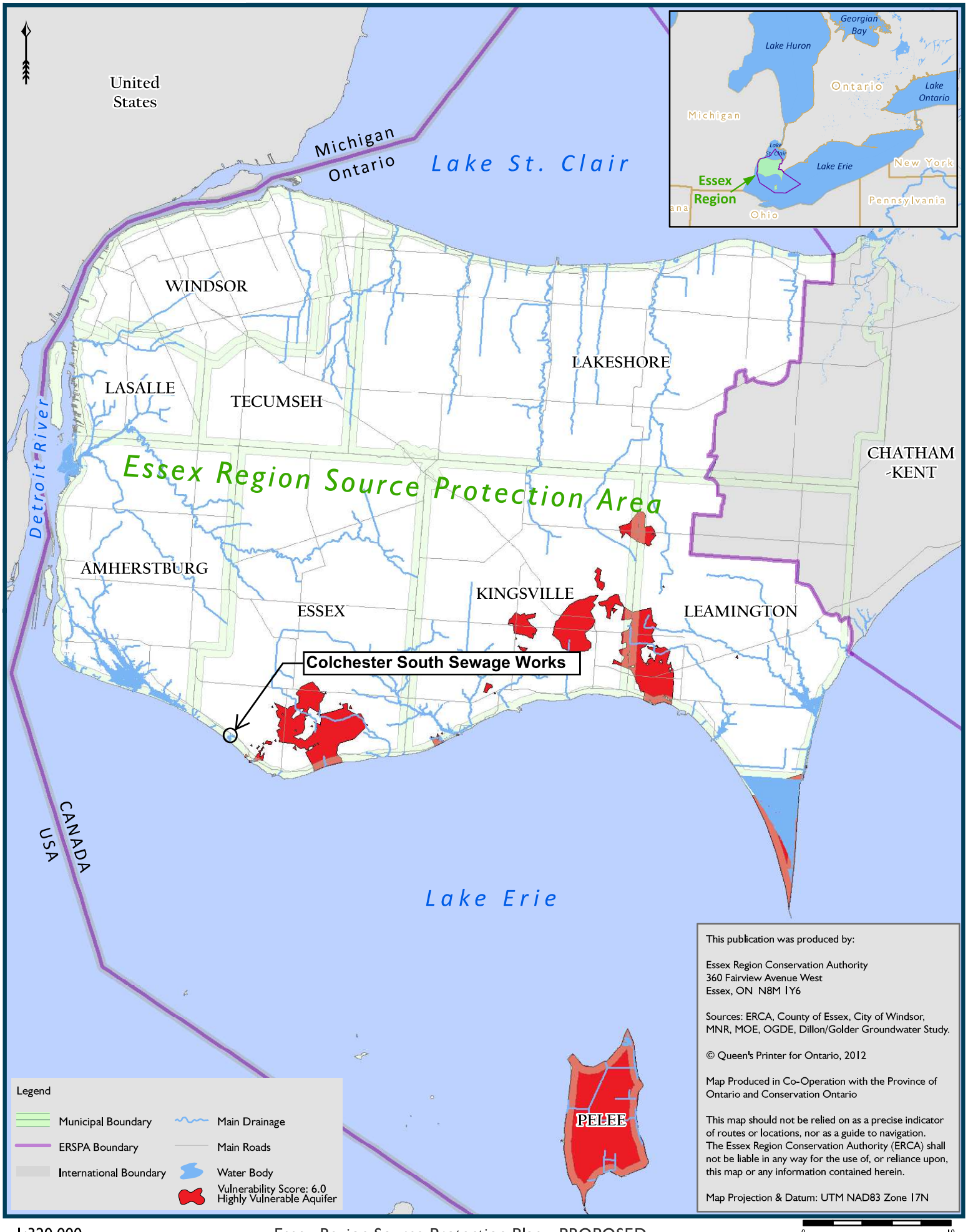
1:160,000

Essex Region Source Protection Plan - PROPOSED

0 5 Kilometers

Map 4: Highly Vulnerable Aquifers

Made possible by the Government of Ontario



Legend

- Municipal Boundary
- ERSPA Boundary
- International Boundary
- Main Drainage
- Main Roads
- Water Body
- Vulnerability Score: 6.0 Highly Vulnerable Aquifer

This publication was produced by:

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360 Fairview Avenue West
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Sources: ERCA, County of Essex, City of Windsor, MNR, MOE, OGDE, Dillon/Golder Groundwater Study.

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Map Projection & Datum: UTM NAD83 Zone 17N

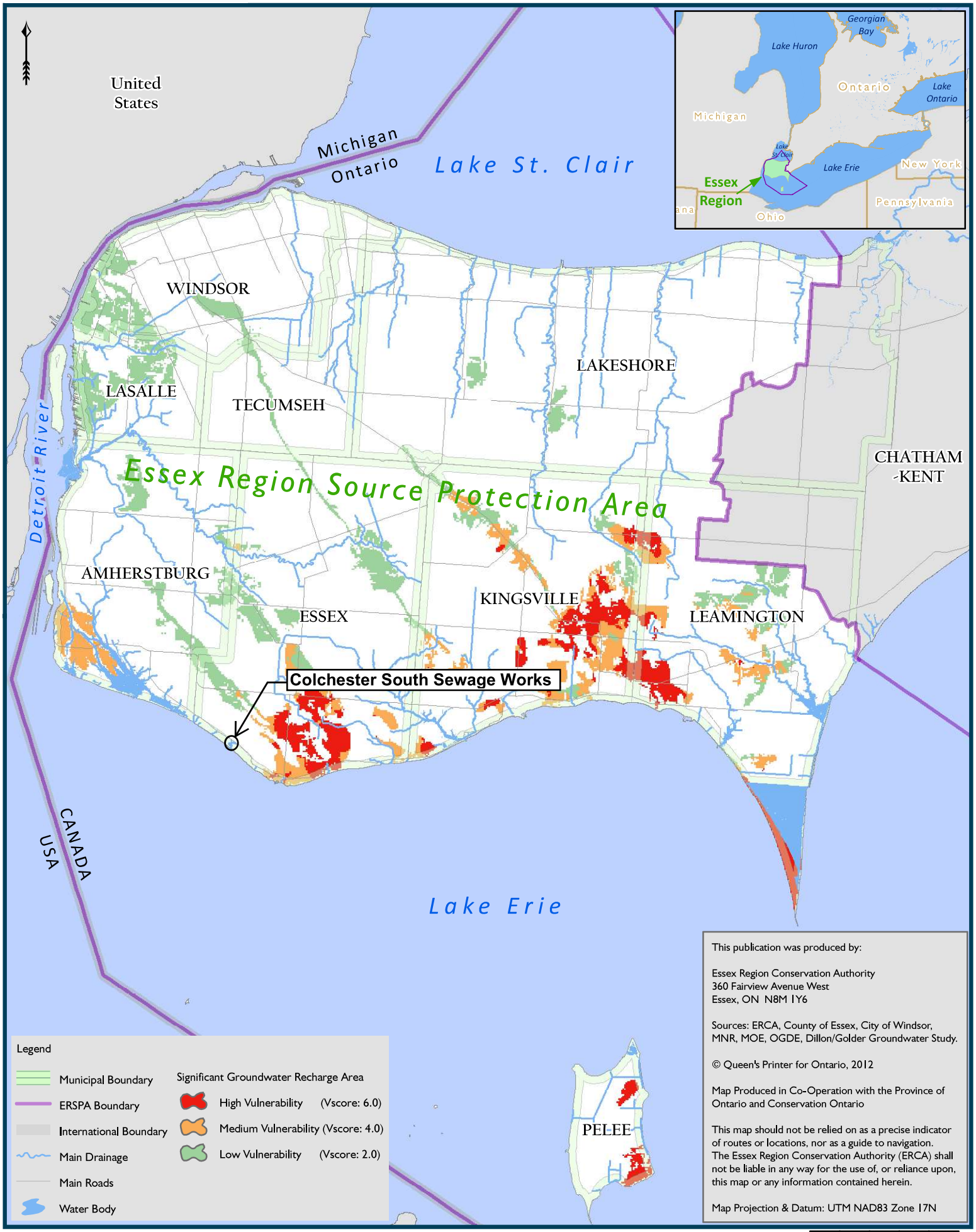
1:320,000

Essex Region Source Protection Plan - PROPOSED

0 10 Kilometers

Map 5: Significant Groundwater Recharge Areas

Made possible by the Government of Ontario



Legend

- Municipal Boundary
- ERSPA Boundary
- International Boundary
- Main Drainage
- Main Roads
- Water Body

Significant Groundwater Recharge Area

- High Vulnerability (Vscore: 6.0)
- Medium Vulnerability (Vscore: 4.0)
- Low Vulnerability (Vscore: 2.0)

This publication was produced by:

Essex Region Conservation Authority
360 Fairview Avenue West
Essex, ON N8M 1Y6

Sources: ERCA, County of Essex, City of Windsor, MNR, MOE, OGDE, Dillon/Golder Groundwater Study.

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Map Projection & Datum: UTM NAD83 Zone 17N

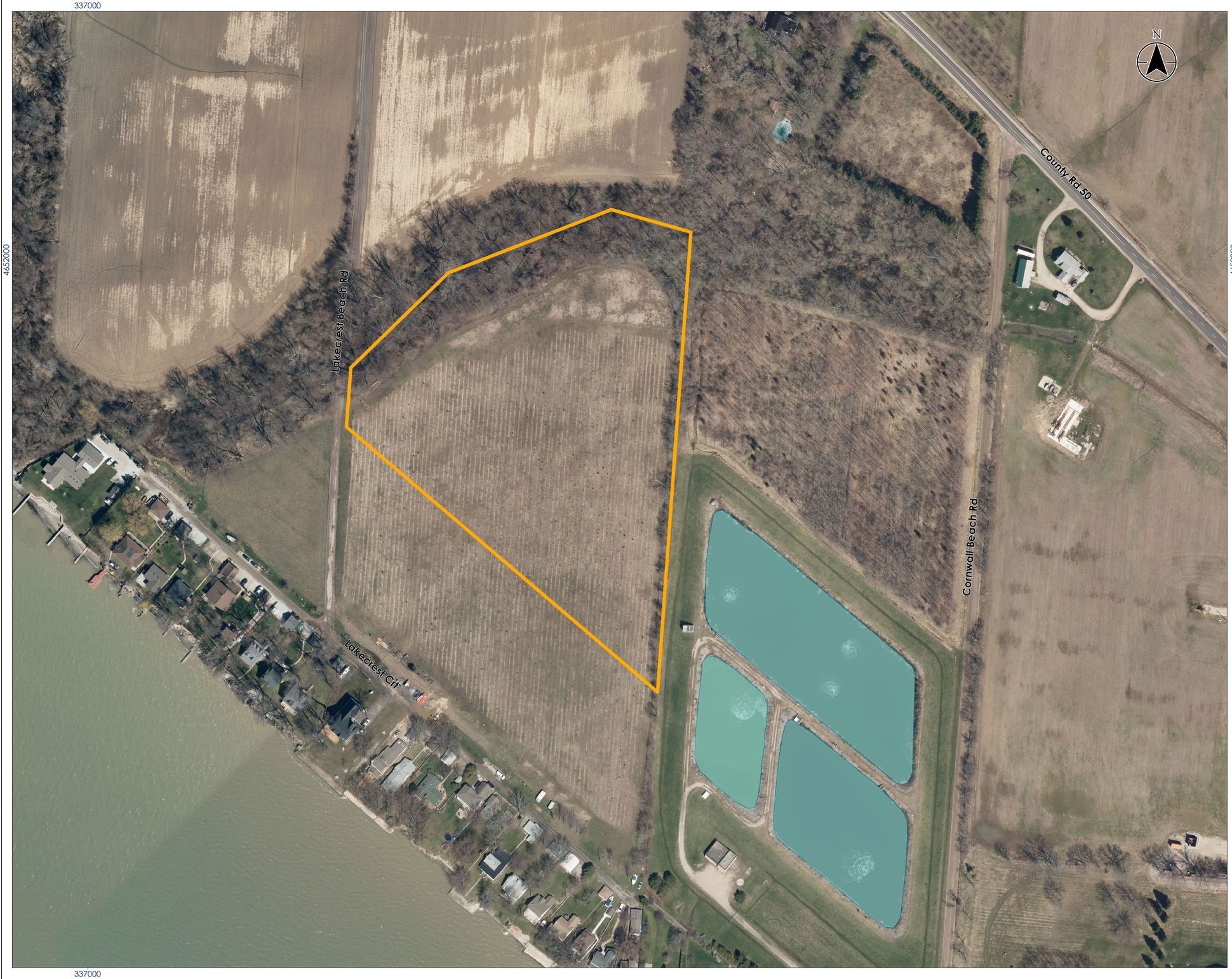
1:320,000

Essex Region Source Protection Plan - PROPOSED

0 10 Kilometers

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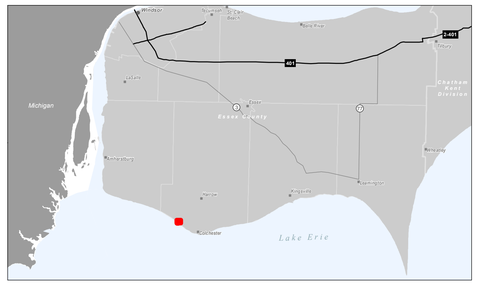
Study Area: 100 m from residents

0 75 150 metres

1:1,112 (At original document size of 22x34)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Orthoimagery © First Base Solutions, 2018. Imagery Date, 2019.
4. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018. Elevations from SWOOP 2015 Digital Elevation Model.



Project Location
Colchester South

165620266 REVA
Prepared by HR on 2023-05-01

Client/Project
Colchester South Sewage Works Expansion

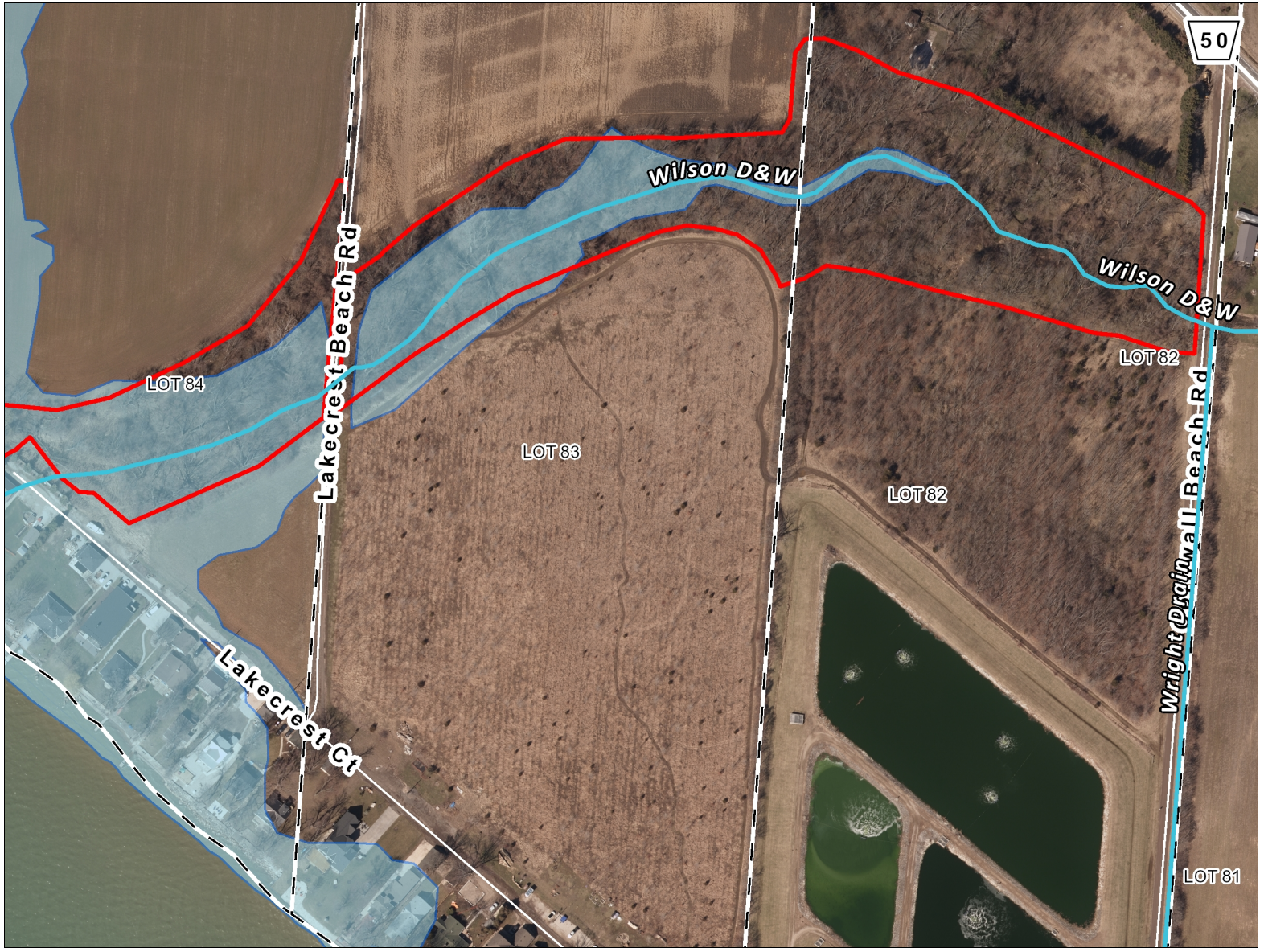
Figure No.
9.4

Title
Study Area for Proposed Work

C:\Users\hrindlisbacher\OneDrive - Stantec\Desktop\Colchester\Figures for ESR\Figure 9.4 165620266_Colchester Study Area 1.4.mxd Revised: 2023-05-01 By: hrindlisbacher

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Lypps Beach Provincially Significant Wetland



Essex Region Conservation Authority

Public Interactive Mapping

Legend

Municipal Drains (ERCA)

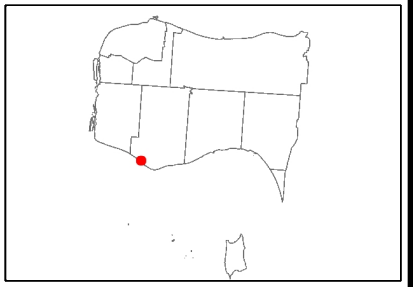
- Natural
- Municipal Drain (Open)
- Municipal Drain (Closed)
- Unknown/Other Status (Open)
- Unknown/Other Status (Closed)
- Private/Roadside (Open)
- Private/Roadside (Closed)

Lots and Concessions

Provincially Significant Wetland (PSW

1:100 yr Flood Line

Location



ERCA Geomatics

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Notes

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APPENDIX B: BACKGROUND

1. Colchester South Sewage Works Environmental Compliance Approval 9096-7SFHHG, May 2009
2. Colchester Sanitary Sewer System Capacity Study, July 2022

APPENDIX B

Colchester South Sewage Works Environmental Compliance Approval

CONTENT COPY OF ORIGINAL

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED CERTIFICATE OF APPROVAL
MUNICIPAL AND PRIVATE SEWAGE WORKS
NUMBER 9096-7SFHHG
Issue Date: May 28, 2009

The Corporation of the Town of Essex
33 Talbot St S
Essex, Ontario
N8M 1A8

Site Location: Colchester South Lagoon
Lot 82, Concession 1
Essex, County of Essex

You have applied in accordance with Section 53 of the Ontario Water Resources Act for approval of:

Alterations to the existing municipal sewage works for the collection, transmission, treatment and disposal of sewage, having a *Rated Capacity* of 1,816 m^3/d and consisting of the following:

PROPOSED WORKS

Sewage Treatment Facilities

- Pilot Project - Experimental Operating Procedure for the period from April 1 to October 31 only, during which the effluent from the primary cell may be discharged directly to the tertiary cell, bypassing the secondary cell;
- Provisions for the use of alum and other appropriate alternate polymerised alums, polyaluminum chloride or iron chlorides and additional/alternate continuous or batch dosing in the primary, secondary cell or tertiary cell to enhance phosphorus and suspended solids removal;

EXISTING WORKS

Sanitary Sewers

- sanitary sewers and appurtenances, including stub sewer connections and building sewers from the main sewer to the street line on Maple Boulevard, Lane approx. 530 m south of County Road No. 50, Easement approx. 380 m south of County Road No. 50, McCarthy Beach Road (private Right-of-Way), Lane approx. 535 m south of County Road No. 50, Easement approx. 460 m south of County Road No. 50, Nottingham Drive, Lincoln Court, Fox Place, Washington Court, Bellcroft Drive, Right-of-Way approx. 100 m south of Fox Place, Ambassador Drive (private drive), Private road approx. 40 m south of Lakeview Avenue, Beverly Boulevard, Santa Ana Avenue, Lakeview Avenue, Sunset Avenue, Santa Monica Blvd., Wilshire Place, Circle V-1 Road (private road), Pleasure Beach Road (private road), Circle V-2 Road (private road), Pigeon Beach Road (private Right-of-Way), Easement just north of Lakeview Avenue, Lakeview Avenue (including the easement extending to the east and the east extension of Cumberland Way), Allison Avenue, Maple Avenue, Windsor Avenue, Cumberland Way (including west extension), Gloucester Drive (Argyle Beach Road), Private Right-of-Way approx. 500 m south of County Road No. 50 (Lots 82 to 86, Conc. 1), Private Right-of-Way approx. 500 m south of County Road No. 50 (Lots 81 & 82, Conc. 1), Wright Road, Easement approx. 600 m south of County Road No. 50 (Lots 77 to 79, Conc. 1), Easement approx. 600 m south of County Road No. 50 (Lots 79 & 80, Conc. 1), Easement approx. 260 m west of Marsden Ave., County Road No. 50, Marsden Avenue, Shawondasee Boulevard, Wabasso Road, Right-of-Way approx. 45 m east of Wabasso Rd., Kayoshk Road, Wawa Crescent, Easement in Tawasentha Park, Dahinda Drive, Easement approx. 55 m west of McClain Boulevard, Victoria Avenue, McClain Boulevard, Chester Road, Private Right-of-Way approx. 185 m east of Westchester Road, Easement approx. 25 m south of Chester Road, Westchester Road, Walnut Lane (private Right-of-Way), Adelaide Street, Prado Avenue, Herring Avenue, Ferris Avenue, Erie Street, Lake Street, Levergood Drive, Dunn Street, Murdock Street, Sullivan Street, Harrison Street, Draper Street, Easement West side of

CONTENT COPY OF ORIGINAL

Jackson Street between Jackson Street and Sullivan Street, Ogden Street, Jackson Street, Sydenham Street, Bagot Street, Clitherow Street, Daley Street;

Sewage Pumping Stations

- pumping station No. 5, located on the private Right-of-Way approx. 185 m east of Westchester Road at the intersection with Chester Road, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 42.4 litres per second at a TDH of 6.13 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations, an inlet sewer from, and an outlet sewer to, the sewer located on the private Right-of-Way approx. 185 m east of Westchester Road;

- pumping station No. 6, located at the intersection between Shawondasee Boulevard and Wabasso Road, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 48.7 litres per second at a TDH of 7.92 metres, including sonic level sensor automatic dual-pump control, and float switch alarm installations, an inlet sewer from the sewer located on Shawondasee Boulevard and an outlet sewer to the sewer located on Wabasso Rd.;

- pumping station No. 7, located on the easement approx. 600 m south of County Road No. 50, approx. 50 m west of Marsden Avenue, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 52.7 litres per second of a TDH of 6.49 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations inlet sewer from, and outlet sewer to, the sewer located on the easement approx. 600 m south of County Road No.50;

- pumping station No. 2, located on the west extension of Cumberland Way, approx. 25 m west of Gloucester Drive, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 34.5 litres per second at a TDH of 9.88 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations, inlet sewer from, and outlet sewer to, the sewer located on the west extension of Cumberland Way;

- pumping station No. 3, located on Erie Street near Maple Boulevard (Lot 20, RP 1466), consisting of a 3,050 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 6.5 litres per second at a TDH of 6.0 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations, inlet sewer from Erie Street and outlet sewer to Maple Boulevard;

Sewage Treatment Facilities

aerated facultative sewage lagoon located on Lot 82, concession 1, to the north of the private Right-of-Way approx. 500 m south of County Road No. 50 and to the west of Cornwall Beach Road, having a *Rated Capacity* of 1,816 m^3/d and consisting of:

- pumping station No. 1, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 94.2 litres per second at a TDH of 15.06 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations, inlet sewer from the sewer located on the private Right-of-Way south of the sewage treatment facilities, valve chamber discharge pipes from the pumps to the valve chamber, and forcemain from the valve chamber to the lagoon inlet distribution chamber;

- three (3) sequentially operated cells having effective capacities of 23,385 cubic metres (primary cell), 13,974 cubic metres (secondary cell) and 6,254 cubic metres (tertiary cell), total depth of 5.0 metres (i.e., 1.0 m freeboard, 0.3 m ice cover allowance, 3.4 m effective depth, 0.3 m sludge storage), width of all berms at the top of 3.0 metres, outer and inner berm slopes of 3:1 (all inner slopes protected against erosion by a layer of crushed limestone placed over filter fabric), blanket drain (polyethylene mesh structure with geotextile on both sides) placed under the top layer of clay lining the cells throughout the bottoms and inner slopes of the cells, including blanket drain collector pipes discharging into the inlet sewer ahead of pumping station No. 1;

- lagoon aeration system consisting of propeller aspirator type aerators mounted on two-pontoon floating assemblies anchored with a cable system to the anchor posts on the cell berms, with four (4) 7½ HP aerators fitted with "7½ HP" propellers in the primary cell, two (2) 7½ HP aerators fitted with "5 HP" propellers in the secondary cell and one (1) 7½

HP aerator fitted with "5 HP" propeller in the tertiary cell;

- inflow distribution and flow control system, including: inlet distribution chamber, two (2) flow control chambers, outfall chamber, cell inflow and outflow pipes, and collection and by-pass sewers;

- control building housing phosphorus removal facility, stand-by diesel generator, laboratory and storage;

- phosphorus removal facility, located in the control building, consisting of a 22.7 cubic metre capacity chemical storage tank, two (2) diaphragm type metering pumps (one installed, one spare) rated at 5 to 50 millilitres per second, and a chemical feed line to pumping station No. 1 with two alternate points of chemical feed in the wet well and in the valve chamber (pressure feed into the forcemain);

- outfall sewer from the lagoon system's outfall chamber to Lake Erie approx. 600 metres off-shore, including valve chamber located within the treatment facility's property and a multi-port diffuser;

Miscellaneous

- all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works;

all in accordance with the following submitted supporting documents:

1. applications dated July 24, 1985 (preliminary), February 15, 1988 (Contract 3), February 24 (Contracts 5 and 6), March 7, 1988 (Contract 1), and March 31, 1988 (Contract 2), and all associated plans and specifications prepared and submitted by LaFontaine, Cowie, Buratto & Associates Limited;
2. Application for Approval of Municipal and Private Sewage Works submitted by Dino Buratto of Stantec Consulting Ltd. received March 4, 2008 for the Pilot Project - Experimental Operating Procedures and subsequent email correspondence dated March 25, 2008 and March 28, 2008;
3. Application for Approval of Municipal and Private Sewage Works submitted by Dino Buratto of Stantec Consulting Ltd. received June 25, 2008 for the alternate chemical and alternate dosing methods for phosphorus removal;
4. Application for Approval of Municipal and Private Sewage Works submitted by Dino Buratto of Stantec Consulting Ltd. dated April 9, 2009.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

"*Act*" means the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended;

""*Average Daily Flow*" means the cumulative total sewage flow to the sewage works during a calendar year divided by the number of days during which sewage was flowing to the sewage works that year;

"*BOD5*" (also known as TBOD5) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demand;

"*By-pass"* means any discharge from the *Works* that does not undergo any treatment or only receives partial treatment before it is discharged to the environment;

"*CBOD5*" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;

"*Certificate*" means this entire certificate of approval document, issued in accordance with Section 53 of the *Act*, and includes any schedules;

"*Daily Concentration*" means the concentration of a contaminant in the effluent discharged over any single day, as measured by a composite or grab sample, whichever is required;

"*Director*" means any *Ministry* employee appointed by the Minister pursuant to section 5 of the *Act*;

"*District Manager*" means the District Manager of the Windsor District Office of the Ministry;

"Existing Works" means those portions of the sewage works previously constructed and existing on-site on the date of issuance of this *Certificate*;

"*Ministry*" means the Ontario Ministry of the Environment;

"*Monthly Average Concentration*" means the arithmetic mean of all *Daily Concentrations* of a contaminant in the effluent sampled or measured, or both, during a calendar month;

"*Monthly Average Daily Flow*" means the cumulative total sewage flow to the sewage works during a calendar month divided by the number of days during which sewage was flowing to the sewage works that month;

"*Owner*" means The Corporation of the Town of Essex and includes its successors and assignees;

"Proposed Works" means the sewage works described in the *Owner*'s application, this *Certificate* and in the supporting documentation referred to herein, to the extent approved by this *Certificate*;

"*Rated Capacity*" means the *Average Daily Flow* for which the *Works* are approved to handle;

"*Regional Director*" means the Regional Director of the Southwestern Region of the Ministry; and

"*Works*" means the sewage works described in the *Owner*'s application, this *Certificate* and in the supporting documentation referred to herein, to the extent approved by this *Certificate* and includes both *Existing Works* and *Proposed Works*.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

(1) The *Owner* shall ensure that any person authorized to carry out work on or operate any aspect of the *Works* is notified of this *Certificate* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Except as otherwise provided by these Conditions, the *Owner* shall design, build, install, operate and maintain the *Works* in accordance with the description given in this *Certificate*, the application for approval of the works and the submitted supporting documents and plans and specifications as listed in this *Certificate*.

(3) Where there is a conflict between a provision of any submitted document referred to in this *Certificate* and the Conditions of this *Certificate*, the Conditions in this *Certificate* shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

(4) Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(5) The requirements of this *Certificate* are severable. If any requirement of this *Certificate*, or the application of any requirement of this *Certificate* to any circumstance, is held invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this certificate shall not be affected thereby.

(6) The approval granted by this *Certificate* is based upon a review of the *Works* in the context of its effect on the environment, its process performance and general principles of wastewater engineering. The review did not include a consideration of the architectural, mechanical, electrical or structural components and minor details of the *Works* except to the extent necessary to review the *Works*.

2. EXPIRY OF APPROVAL

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The approval for the Pilot Project - Experimental Operating Procedure issued by this *Certificate* will cease to apply to when the recorded *Monthly Average Daily Flow* to the sewage treatment facilities exceed 1,200 m^3/d.

3. CHANGE OF OWNER

(1) The *Owner* shall notify the *District Manager* and the *Director*, in writing, of any of the following changes within 30 days of the change occurring:

(a) change of *Owner*;

(b) change of address of the *Owner*;

(c) change of partners where the *Owner* is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c.B17 shall be included in the notification to the *District Manager*;

(d) change of name of the corporation where the *Owner* is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C39 shall be included in the notification to the *District Manager*;

(2) In the event of any change in ownership of the *Works*, other than a change to a successor municipality, the *Owner* shall notify in writing the succeeding owner of the existence of this *Certificate*, and a copy of such notice shall be forwarded to the *District Manager* and the *Director*.

4. RECORD DRAWINGS

(1) A set of as-built drawings showing the works "as constructed" shall be kept up to date through revisions undertaken from time to time and a copy shall be retained at the *Works* for the operational life of the *Works*.

5. BY-PASSES

(1) Any *By-pass* of sewage from any portion of the *Works* is prohibited, except where:

(a) it is permitted under the Pilot Project - Experimental Operating Procedure for the period from April 1 to October 31 only, during which the effluent from the primary cell may be discharged directly to the tertiary cell, bypassing the secondary cell;

(b) it is necessary to avoid loss of life, personal injury, danger to public health or severe property damage;

(c) the *District Manager* agrees that it is necessary for the purpose of carrying out essential maintenance and the *District Manager* has given prior written acknowledgment of the *by-pass*; or

(d) the *Regional Director* has given prior written acknowledgment of the *By-pass*.

(2) The *Owner* shall collect at least one (1) grab sample of the *By-pass* and have it analyzed for the parameters outlined in Condition 7 using the protocols in Condition 9.

(3) The *Owner* shall maintain a logbook of all *By-pass* events which shall include, at a minimum, the time, location, duration, quantity of *By-pass*, the authority for *By-pass* pursuant to subsection (1), and the reasons for the occurrence.

6. EFFLUENT OBJECTIVES

(1) The *Owner* shall use best efforts to design and operate the *Works* with the objective that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the *Works*.

Table 1 - Effluent Objectives	
Effluent Parameter	**Concentration Objective** (milligrams per litre unless otherwise indicated)
CBOD5	20.0
Total Suspended Solids	25.0
Total Phosphorus	0.8

(2) The *Owner* shall use best efforts to:

(a) maintain the pH of the effluent from the *Works* within the range of 6.5 - 9.0, inclusive, at all times;

(b) operate the works within the *Rated Capacity* of the *Works*;

(c) ensure that the effluent from the *Works* is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film or sheen or foam or discolouration on the receiving waters.

(3) The *Owner* shall include in all reports submitted in accordance with Condition 10 a summary of the efforts made and results achieved under this Condition.

7. EFFLUENT LIMITS

(1) The *Owner* shall design and operate and maintain the *Works* such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the *Works*.

Table 2 - Effluent Limits	
Effluent Parameter	**Average Concentration** (milligrams per litre unless otherwise indicated)
CBOD5	25.0
Total Suspended Solids	30.0
Total Phosphorus	1.0

(2) For the purposes of determining compliance with and enforcing subsection (1):

(a) The *Monthly Average Concentration* of a parameter named in Column 1 of subsection (1) shall not exceed the corresponding maximum concentration set out in Column 2 of subsection (1).

(3) Subsection (2) shall apply upon the issuance of this *Certificate.*

8. OPERATION AND MAINTENANCE

(1) The *Owner* shall exercise due diligence in ensuring that, at all times, the *Works* and the related equipment and appurtenances used to achieve compliance with this *Certificate* are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate operator staffing and training, including training in all procedures and other requirements of this *Certificate* and the *Act* and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the *Works*.

(2) The *Owner* shall prepare an operations manual, that includes, but not necessarily limited to, the following information:

(a) operating procedures for routine operation of the *Works*;

(b) inspection programs, including frequency of inspection, for the *Works* and the methods or tests employed

to detect when maintenance is necessary;

(c) repair and maintenance programs, including the frequency of repair and maintenance for the *Works*;

(d) procedures for the inspection and calibration of monitoring equipment;

(e) a spill prevention control and countermeasures plan, consisting of contingency plans and procedures for dealing with equipment breakdowns, potential spills and any other abnormal situations, including notification of the *District Manager*; and

(f) procedures for receiving, responding and recording public complaints, including recording any followup actions taken.

(3) The *Owner* shall maintain the operations manual current and retain a copy at the location of the *Works* for the operational life of the *Works*. Upon request, the *Owner* shall make the manual available to *Ministry* staff.

(4) The *Owner* shall provide for the overall operation of the *Works* with an operator who holds a licence that is applicable to that type of facility and that is of the same class as or higher than the class of the facility in accordance with Ontario Regulation 129/04.

9. MONITORING AND RECORDING

The *Owner* shall, upon commencement of operation of the *Works*, carry out the following monitoring program:

(1) All samples and measurements taken for the purposes of this *Certificate* are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) For the purposes of this condition, the following definitions apply:

(a) Daily means once each day;
(b) 3/Week means three times each week;
(c) Weekly means once each week;
(d) Monthly means once every month;

(3) Samples shall be collected at the following sampling points, at the frequency specified, by means of the specified sample type and analyzed for each parameter listed and all results recorded:

Table 3 - Influent Monitoring	
Frequency	Monthly
Sample Type	Composite
Parameters	*BOD5*, Total Suspended Solids, Total Phosphorus

Table 4 - Effluent Monitoring under normal operating procedure - discharge from tertiary cell		
Parameters	**Sample Type**	**Frequency**
CBOD5	Composite	Weekly
Total Suspended Solids	Composite	Weekly
Total Phosphorus	Composite	Weekly
pH	Grab	Weekly
Temperature	Grab	Weekly
Alkalinity	Grab	Weekly

Table 5 - Effluent Monitoring under experimental operating procedure - discharge from primary cell and tertiary cell		
Parameters	**Sample Type**	**Frequency**
CBOD5	Composite	Weekly
Total Suspended Solids	Composite	3/Week
Total Phosphorus	Composite	Weekly
pH	Grab	Daily
Temperature	Grab	Daily
Alkalinity	Grab	Daily

(4) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's Procedure F-10-1, “Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended from time to time by more recently published editions;

(b) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

(c) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions;

(5) The measurement frequencies specified in subsection (3) in respect to any parameter are minimum requirements which may be modified by the *District Manager* in writing from time to time.

(6) The *Owner* shall install and maintain continuous flow measuring device, to measure the flowrate of the influent to or effluent from the *Works* with an accuracy to within plus or minus 15 per cent (+/- 15%) of the actual flowrate for the entire design range of the flow measuring device, and record the flowrate at a daily frequency.

10. REPORTING

(1) One week prior to the start up of the operation of the Pilot Project - Experimental Operating Procedure, the *Owner* shall notify the *District Manager* (in writing) of the pending start up date.

(2) Ten (10) days prior to the date of a planned *By-pass* being conducted pursuant to Condition 5 and as soon as possible for an unplanned *By-pass*, the *Owner* shall notify the *District Manager* (in writing) of the pending start date, in addition to an assessment of the potential adverse effects on the environment and the duration of the *By-pass*.

(3) The *Owner* shall report to the *District Manager* or designate, any exceedence of any parameter specified in Condition 7 orally, as soon as reasonably possible, and in writing within seven (7) days of the exceedence.

(4) In addition to the obligations under Part X of the Environmental Protection Act, the *Owner* shall, within 10 working days of the occurrence of any reportable spill as defined in Ontario Regulation 675/98, bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the *District Manager* describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

(5) The *Owner* shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to *Ministry* staff.

(6) The *Owner* shall prepare, and submit to the *District Manager,* a performance report, on an annual basis, within ninety (90) days following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the *Works* and subsequent reports shall be submitted to cover successive

annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

(a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7, including an overview of the success and adequacy of the *Works*;

(b) a description of any operating problems encountered and corrective actions taken;

(c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the *Works*;

(d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;

(e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment; and

(f) a description of efforts made and results achieved in meeting the Effluent Objectives of Condition 6.

(g) a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;

(h) a summary of any complaints received during the reporting period and any steps taken to address the complaints;

(i) a summary of all *By-pass*, spill or abnormal discharge events; and

(j) any other information the *District Manager* requires from time to time.

(7) The *Owner* shall submit to the *Regional* Director and *District Manager* on a weekly basis, all pertinent information and monitoring results when the sewage treatment facilities are operated under Experimental Operating Procedure and within one week of these information becoming available.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the *Works* are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the *Certificate* and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this *Certificate* the existence of this *Certificate*.

2. Condition 2 is included to ensure that the Experimental Operating Procedure is only used during relatively warm seasonal period and under low flow condition.

3. Condition 3 is included to ensure that the *Ministry* records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the *Works* are made aware of the *Certificate* and continue to operate the *Works* in compliance with it.

4. Condition 4 is included to ensure that record drawings of the *Works* “as constructed” are maintained for future references.

5. Condition 5 is included to indicate that by-passes of untreated sewage to the receiving watercourse is prohibited, save in certain limited circumstances where the failure to *By-pass* could result in greater injury to the public interest than the *By-pass* itself where a *By-pass* will not violate the approved effluent requirements, or where the *By-pass* can be limited or otherwise mitigated by handling it in accordance with an approved contingency plan. The notification and documentation requirements allow the *Ministry* to take action in an informed manner and will ensure the *Owner* is aware of the extent and frequency of *By-pass* events.

6. Condition 6 is imposed to establish non-enforceable effluent quality objectives which the *Owner* is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits of Condition 7 are

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exceeded.

7. Condition 7 is imposed to ensure that the effluent discharged from the *Works* to Lake Erie meets the *Ministry*'s effluent quality requirements thus minimizing environmental impact on the receiver and to protect water quality, fish and other aquatic life in the receiving water body.

8. Condition 8 is included to require that the *Works* be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the owner and made available to the *Ministry*. Such a manual is an integral part of the operation of the *Works*. Its compilation and use should assist the *Owner* in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for *Ministry* staff when reviewing the *Owner*'s operation of the work.

9. Condition 9 is included to enable the *Owner* to evaluate and demonstrate the performance of the *Works*, on a continual basis, so that the *Works* are properly operated and maintained at a level which is consistent with the design objectives and effluent limits specified in the *Certificate* and that the *Works* does not cause any impairment to the receiving watercourse.

10. Condition 10 is included to provide a performance record for future references, to ensure that the *Ministry* is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this *Certificate,* so that the *Ministry* can work with the *Owner* in resolving any problems in a timely manner.

This Certificate of Approval revokes and replaces Certificate(s) of Approval No. 0816-7H9NL3, 3-1359-81-006, 3-0886-87-006 issued on August 11, 2008, December 18, 1981, July 22, 1987

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Section 53, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted sewage works are approved under Section 53 of the Ontario Water Resources Act.

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DATED AT TORONTO this 28th day of May, 2009

Mansoor Mahmood, P.Eng.
Director
Section 53, *Ontario Water Resources Act*

FL/
c: District Manager, MOE Windsor
Dino Buratto, Stantec Consulting Ltd.
Water Standards Section, MOE Standards Development Branch

APPENDIX B

Colchester Sanitary Sewer System Capacity Study

Town of Essex

Colchester Sanitary Sewer System Capacity Study

Prepared for:
Town of Essex

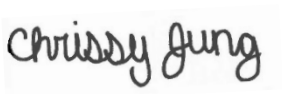
Prepared by:
Stantec Consulting Ltd.

July 21, 2022

Revision No.	Description	Reviewed
1	Draft – Owner Review	JL
2	Final	JL

Sign-off Sheet

This document entitled Colchester Sanitary Sewer System Capacity Study was prepared by Stantec Consulting Ltd. ("Stantec") for the account of the Town of Essex (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not consider any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by  _____

(signature)

Chrissy Jung, MASc, EIT, Environmental Engineering Intern

Reviewed by  _____

(signature)

Jian Li, P. Eng. PE, PhD, Senior Environmental Engineer

Stantec

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Executive Summary

The southern portion, or Urban Area, of Colchester is serviced with a communal sanitary sewer collection system. Wastewater within this service area is collected using gravity type sewer systems complete with six (6) lift stations. These sanitary sewer systems direct all wastewater into a main pumping station (PS No.1) located west of the Colchester Town center; where it is then pumped, via a 300mm dia. forcemain to the Colchester South Lagoon for treatment.

The Town has been realizing increasing wastewater servicing demands from development pressures in various settlement areas throughout the Colchester South Community. To address these demands, the Town has initiated a Wastewater Master Plan Study (WWMP) to examine wastewater servicing needs throughout the Colchester South Community. The purpose of the study was to assess the capacity of the sanitary collection system based on the current raw sewage flows and area serviced. The hydraulic capacity of the existing sanitary sewer system was assessed, and upgrades are identified to accommodate future development in the Colchester sanitary collection service area.

The existing Colchester South wastewater treatment facility consists of aerated facultative lagoons having a hydraulic capacity of 1,816 m^3/d for a projected future service population of approximately 4,000 persons. The average daily sewage flows to the treatment facility for 2015 to 2020 was approximately 1,040 m^3/d. The current service area includes residential development along the north shore of Lake Erie from the Community of Colchester to the westerly limit of the Town of Essex. Within this service area the pumping stations have a capacity of 5,090 residents and the collection system has a capacity of 13,322 residents.

The existing development in the Colchester South region was determined using the system's design basis and the number of private lots and the industrial, commercial, and institutional (ICI) establishments serviced based on the 2019 aerial photograph. Based on this the current development in the region allows for adequate capacity in at the pumping stations, sewer network, and the treatment facility with an estimated population of 3,878 residents. The projected population conditions are based on the existing lot conditions (2019 ariel photograph) combined with the anticipated occupancy projections of undeveloped land from the system design basis. Based on this the projected ultimate population in the region is 12,797 residents. For this level of service, the pumping stations would require upgrading (replacing pumps) and the treatment facility would require upgrading or expansion. The sewer network would not require upgrading given the allowable population densities presented in Table 4.7 are followed.

Abbreviations

ICI	Industrial, commercial, and institutional
IDF curve	Intensity duration frequency curve
I/I	Inflow and infiltration
PS	Pumping station
RSP	Raw sewage pump
SWM	Stormwater management
WWTP	Wastewater Treatment Plant

Glossary

20-Year Design	Sewer system designed to accommodate sewage flows using residential and ICI planned development over a 20-year time period from the date of design, and with minor retrofits can accommodate the ultimate design sewage flows
Basement flooding	The potential for basement flooding was assumed if surcharge level in the sanitary sewer exceeded 1.8 m (6') below ground level elevation.
Equivalent Population	Number of persons contributing the design equivalent average daily domestic wastewater flow (450Lpcd)
Flooding	Occurs when the liquid level rises above the elevation of grade and overflows onto the road, ground, etc.
Hydraulic grade line (HGL)	The liquid level elevation in the sanitary sewer network.
Pipe Capacity	Ratio of maximum flow to the pipe capacity calculated by the Manning equation (Q_{MAX}/Q_{CAP}). Ratio's exceeding 1.0 exceeds pipe design capacity. Ratio's between 0.7 to 1.0 have marginal pipe capacity remaining. Ratio's between 0.0 to 0.7 have adequate pipe capacity remaining.
Surcharge	Occurs when the liquid level rises above pipe crown (top of pipe).
Ultimate Design	Sewer system designed to accommodate ultimate sewage flows from all residential and ICI planned development over entire the service area
Pumping Stations: Lift Station Pump Station	Pumping station where raw sewage is lifted vertically within the wet well. Pumping station where raw sewage is lifted vertically within the wet well and pumped horizontally via a forcemain

1.0 INTRODUCTION

1.1 BACKGROUND

Colchester is located along the southern shoreline of Essex County, bordering the Township of Harrow to the north, the Town of Amherstburg to the west, the Town of Kingsville to the east, and Lake Erie to the south. With municipal restructuring that took place in Essex County on January 1, 1999, the former Towns of Essex and Harrow and the former Townships of Colchester North and Colchester South were amalgamated to form the present Town of Essex.

The Colchester sanitary sewer system was initially designed in the 1970s and 1980s. The design was finalized in the mid-1980s and construction of the system was completed in late1980's. The sewer system was constructed to service existing development but was designed to accommodate future development within the boundaries of the urban centre of Colchester. The sewer system has since been extended with some modifications to sewershed areas over the years as development proceeded. The sanitary collection system's design basis discussed in the proceeding sections is the result of the original design basis with revisions made over the years as development proceeded.

Overall, the topography in the Colchester urban area is flat with poor soil conditions. The service area may be considered as two distinct sections; the eastern and the western sections with the boundary lying between lots 76 and 77 (near Marsden Beach road). The soil in the eastern section consists of mainly fine sand having a wide density range and the groundwater table approximately 3.1 m (10 ft) below the ground surface. The soil in the western section consists of mainly clay till with an upper weathered zone of brown clay, a desiccated zone of brown clay at a depth of 2.1 to 4.6 m (7 to 15 ft), and a plastic zone of gray clay at a depth of 4.0 to 6.1 m (13 to 20 ft). The long-term groundwater table in the western section is expected to be close to the interface between the brown and grey clay. To avoid installation below the groundwater table as much as possible, sewers have been designed with a minimum depth of 1.8 m (6 ft) to provide private service connections at the property line at 1.35 m (4' 6") below ground level. The system's shallow sewer depths require buildings with drainage fixtures below the sanitary service invert to use sewage ejector pumps to lift raw sewage into the Town's sewer system.

The Town's sanitary service area extends from County Road 41 on the west to County Road 13 and Island View Lane on the east, from the northern town limit (Ogden Street) and County Road 50 on the north to the shoreline of Lake Erie on the south. Wastewater in the service area is collected in a gravity sanitary sewer system, with six (6) existing lift pumping stations across the service area. The collection system directs wastewater to Pumping Station No. 1 (P.S. No.1), located west of the Colchester Town center; where it is then pumped, via a 300mm dia. forcemain to the Colchester South Lagoon for treatment. The Colchester Sewage Works are owned by the Town of Essex and currently operated by the Ontario Clean Water Agency (OCWA).

1.2 OBJECTIVE

To develop a hydraulic model of the Township of Colchester's sanitary sewer system, calibrate and perform a capacity assessment on the sewer system to identify potential wet weather improvements to improve the level of service and mitigate sanitary basement flooding.

1.3 DATA SOURCE

The sources of information referred to in this study included as-built drawings, field investigations, previous reports, codes, standards, and guidelines. The list of references includes:

1. Town of Essex Interactive Mapping Service.
2. Town of Essex Official Plan adopted by Council 2009, revised 2019.
3. Town of Essex Zoning By-Law No. 1037, adopted by Council July 2010.
4. Design Report Township of Colchester South Provincial Sewage Works Program OMOE Project No. 1-0331-73. LCVA, 1977.
5. Township of Colchester South – Direct Grant Sewage Works Design Sheets. LCBA, 1998 – 1990.
6. Sewage Design Guidelines for Sewage Works. Ontario MECP. 2020.
7. D-5-1 Guideline: Calculating and Reporting Uncommitted Reserve Capacity at Sewage and Water Treatment Plants. Ontario MECP. Published 2016, Updated 2019.
8. Guidelines for Performing Infiltration/Inflow Analyses and Sewer System Evaluation Survey. 1993. Boston, Mass: Commonwealth of Massachusetts, Dept. of Environmental Protection, Bureau of Municipal Facilities.
9. Ontario Building Code, 2017. Ontario Ministry of Municipal Affairs and Housing.
10. Computer Tools for Sanitary Sewer System Capacity Analysis and Planning. USEPA, 2007.
11. Review of Sewer Design Criteria and RDI/I Prediction Methods. USEPA, 2008.

2.0 EXISTING CONDITIONS

2.1 DESCRIPTION OF SANITARY SEWER SYSTEM

2.1.1 Sewershed System Layout

The Urban Area of Colchester, which consists of six (6) sewersheds, is serviced with a municipal sanitary sewer collection system. Each sewershed is serviced by its own dedicated sewage pumping station. Wastewater within each sewershed is collected using gravity sanitary sewer systems complete with its dedicated lift pumping station, which lift the flow from its own sewershed as well as the flow from the upstream of the sewershed(s). The wastewater flow diagram for the sanitary sewersheds is shown in **Figure 2.1.**

The figure shows that Pumping Stations No.'s 2 and 3 pump raw sewage from the western portion of Colchester, while stations No.'s 4 (future construction), 5, 6, and 7 pump raw sewage from the eastern portion of Colchester to Pumping Station No.1 (main pumping station). The main pumping station pumps all the raw sewage from Colchester to the Colchester South Lagoon for treatment.

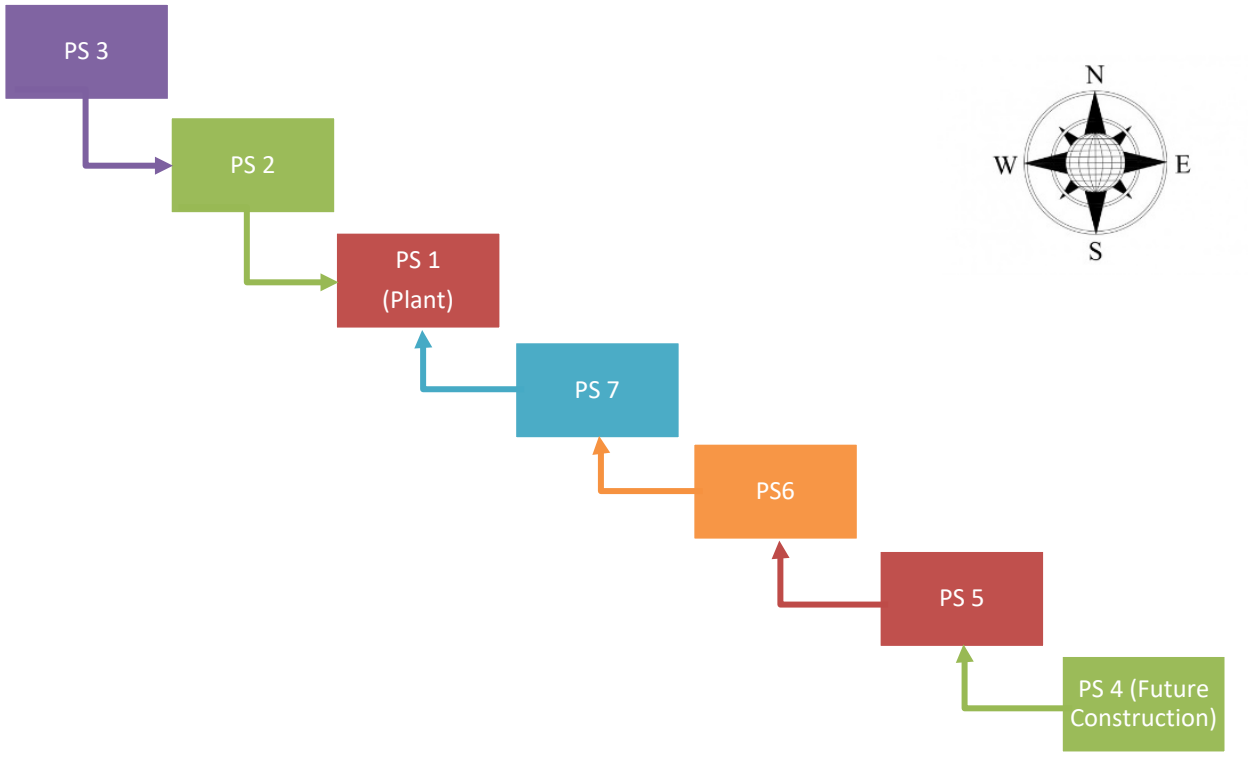


Figure 2.1: Process flow diagram of Colchester's sanitary collection system

2.1.2 Sewer System Design Basis

2.1.2.1 Sewage Flows

The sewage flow design basis for the entire sanitary sewer system is summarized in **Table 2.1**. In the 1980's when the pumping stations were being designed a '20-year' design basis was used to size the pumping stations. However, no modifications have been made to the pumping stations since their construction. The sewers and the wastewater treatment facility were sized under the ultimate design basis.

The average sewage flow of 454L/cap/d is typical of current ministry design guidelines and Town Development Standards. The peak extraneous flow of 0.14L/s/ha is lower than the 0.21 L/s/ha specified in most current municipal Development Standards Manuals in Essex County, but was typical industry standard at the time of the original system's design.

The soil in Colchester west of the treatment facility is mainly clay type while the soil east of the treatment facility is mainly fine sand type. Due to the variation in soil type and increased infiltration in the eastern section a higher peak extraneous flow was selected for the ultimate design period.

Table 2.1: Sanitary collection system flow design basis

Design Parameter	ORIGINAL Design	ULTIMATE Design
Sewage Flow Average Sewage Flow	364 L/cap/d (80 lgpcd)	454 L/cap/d (100 lgpcd)
Peaking Factor	Harmon	Harmon
Peak Extraneous Flow	227 L/cap/d	0.14 L/s/ha (1) (0.002 cfs/ac) OR 0.28 L/s/ha (2) (0.004 cfs/ac)

Notes:
(1) Peak I/I Ultimate= 0.14 L/s/ha used to design the sanitary sewer system west of the treatment facility (clay soil).
(2) Peak I/I Ultimate= 0.28 L/s/ha used to design the sanitary sewer system east of the treatment facility (sandy soil).

2.1.2.2 Population Density

Table 2.2 presents a summary of the sewage collection system's design population densities. The population density and average unit sewage flow sourced from the Ministry of Environment,

Conservation, and Parks (MECP) Design Guidelines for Sewage Works (2008) 'Table 5-3 – Common Sewage Flow Rates for Commercial and Institutional Uses' or Metcalf & Eddy (2002).

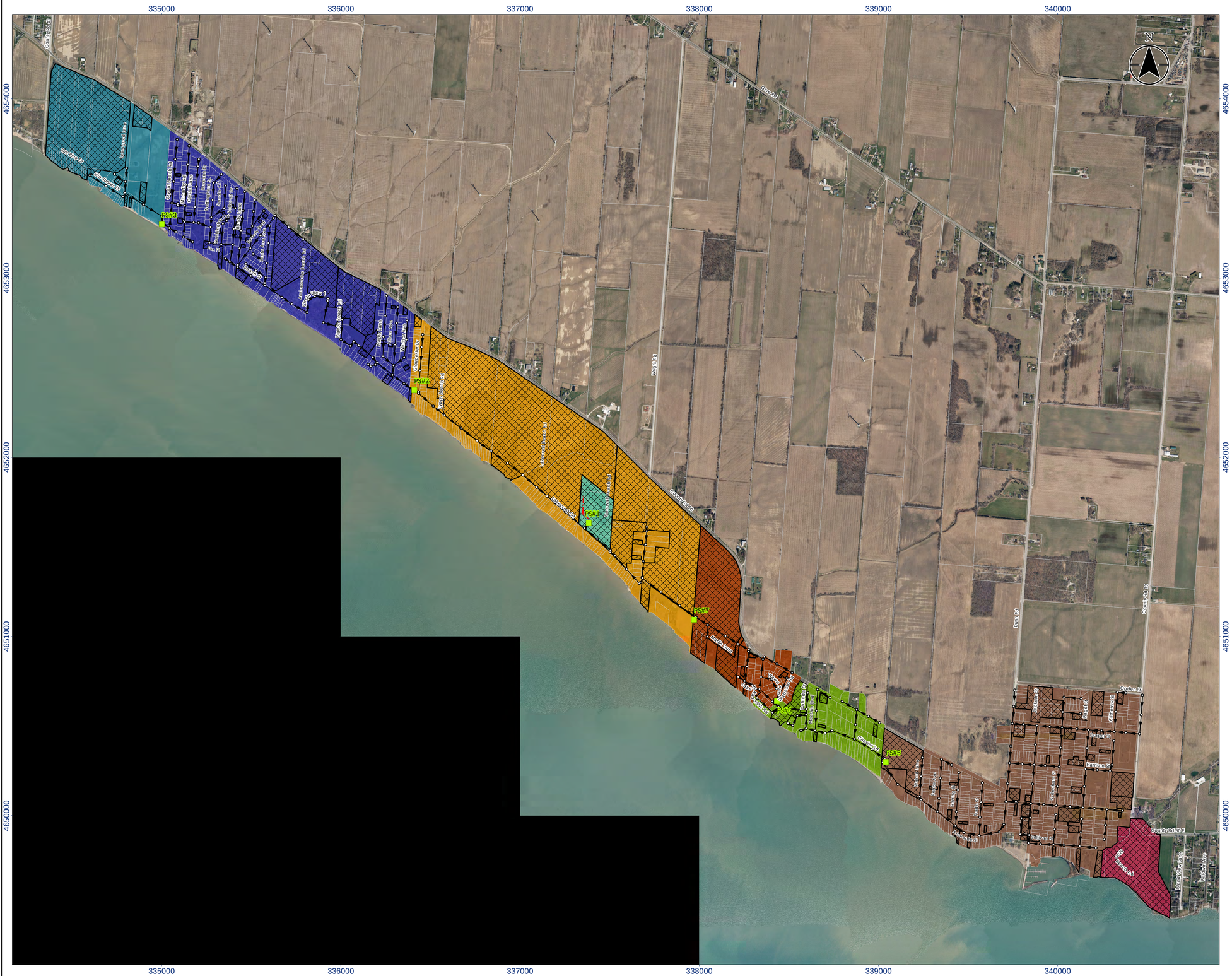
Table 2.2: Sanitary system population density design basis

Land Use	Pop. Density	Avg. Unit Sewage Flow
Residential	35 ppha (1) OR 3.25 ppd (2)	16 m^3/ha/d
Mobile Park Homes	2.20 ppd	1 m^3/d
Industrial	Varies	Varies
Commercial	Varies	Varies

Notes:
(1) A population density of 35 persons per hectare was used for undeveloped lots within the service area.
(2) A population density of 3.25 persons per dwelling was used for developed lots withing the service area.

2.1.3 Sewershed Design

The boundaries of the sanitary sewer service area and each sewershed are shown in **Figure 2.2**. Sewershed areas excluded walking trails, public parks, watercourses, SWM facilities, and some Natural Environment and Wetland zoned areas designated to remain undeveloped by the Town through the Zoning By-law and Planning Act. Some of the undeveloped/not-serviced future areas are approximate based on available information at time of the subject study. The figure shows that Colchester's sanitary sewer system consists of six (6) existing sewersheds each serviced by their own dedicated sewage pumping station. There is one (1) additional sewershed designed to be serviced by pumping station No. 4, not constructed, that is currently serviced by pumping station No. 5.


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Mersea Twp
Colchester South
Colchester North
Colchester Beach
Colchester Harbour
Colchester Pier
Colchester Point
Colchester Reef
Colchester Shoal
Colchester Bar
Colchester Ridge
Colchester Island
Colchester Rock
Colchester Sand
Colchester Spit
Colchester Flat
Colchester Cove
Colchester Bay
Colchester Creek
Colchester Inlet
Colchester Lagoon
Colchester Marsh
Colchester Swamp
Colchester Woods
Colchester Meadow
Colchester Field
Colchester Farm
Colchester Barn
Colchester Silo
Colchester Grain
Colchester Elevator
Colchester Warehouse
Colchester Factory
Colchester Mill
Colchester Foundry
Colchester Workshop
Colchester Garage
Colchester Station
Colchester Depot
Colchester Yard
Colchester Dock
Colchester Wharf
Colchester Quay
Colchester Boat
Colchester Ship
Colchester Sail
Colchester Anchor
Colchester Rope
Colchester Net
Colchester Fish
Colchester Bait
Colchester Tackle
Colchester Hook
Colchester Line
Colchester Float
Colchester Buoy
Colchester Light
Colchester Beacon
Colchester Tower
Colchester Lighthouse
Colchester Keeper
Colchester Cottage
Colchester House
Colchester Home
Colchester Family
Colchester Children
Colchester School
Colchester Church
Colchester Hall
Colchester Library
Colchester Museum
Colchester Park
Colchester Garden
Colchester Flower
Colchester Tree
Colchester Forest
Colchester Wood
Colchester Path
Colchester Trail
Colchester Road
Colchester Street
Colchester Avenue
Colchester Lane
Colchester Drive
Colchester Court
Colchester Place
Colchester Square
Colchester Circle
Colchester Crescent
Colchester Terrace
Colchester Gate
Colchester Fence
Colchester Wall
Colchester Bridge
Colchester Tunnel
Colchester Railway

2.1.3.1 Equivalent Design Populations

Table 2.3 summarizes the design population and area for each sewershed under the EXISTING design criteria and the ULTIMATE design criteria. The design populations were calculated using the system's design basis (refer to **Section 2.1.2**) for each land use type within the sewershed. The pumping stations were constructed using the ORIGINAL design – P.S. Equivalent Population, the Colchester South WWTP was constructed using the ORIGINAL design – WWTP Equivalent Population, and the sewer piping network was constructed using the ULTIMATE design – Equivalent Population.

Table 2.3: Individual sewershed design areas & populations

Sewershed No.	ORIGINAL Design			ULTIMATE Design		
	Area (ha)	P.S. Equiv. Population (persons)	WWTP Equiv. Population (persons)	Average Population Density (person/ha)	Area (ha)	Equiv. Population (persons)
1	-	355	279	33.9	102.3	3463
2	-	1550	904	35.4	87.9	3096
3	-	325	255	32.0	45.6	1460
4 (1)	-	450	354	35.0	12.8	450
5	-	1890	1485	29.3	107.9	3166
6	-	320	251	21.8	19.0	415
7	-	200	157	29.4	43.2	1272
TOTAL		**5,090**	**4,000**		**419**	**13,322**

Note:
(1) The Pumping Station No. 4 has not been constructed and the corresponding sewershed is not serviced by the existing collection system.

2.1.3.2 Sewershed Design Flows

Table 2.4 summarizes the design parameters for each sewershed under the ORIGINAL and ULTIMATE design conditions. The system was designed to service an average sewage flow of 21 L/s, and total peak flow of 94 L/s (8.1 MLD) which corresponds to 5,090 equivalent persons. The sewer system under ULTIMATE conditions was intended to service an average sewage flow of 70 L/s, and total peak flow of 335 L/s (29 MLD) which corresponds to 13,322 equivalent persons.

Table 2.4: Cumulative sewershed design basis

Pumping Station	ORIGINAL Design				ULTIMATE Design			
	Area (ha)	Equiv. Pop. (persons)	Q_{AVG} (L/s)	Q_P (L/s)	Area (ha)	Equiv. Pop. (persons)	Q_{AVG} (L/s)	Q_P (L/s)
1 (WWTP Plant)	-	5090	21	94 (8.1 MLD)	419	13322	70	335 (29 MLD)
2	-	1875	7.9	35	134	4556	24	103
3	-	325	1.4	6.5	46	1460	7.7	35
4 (1)	-	450	1.9	8.8	13	450	2.4	13
5	-	2340	9.9	42	121	3616	19	100
6	-	2660	11	49	140	4031	21	114
7	-	2860	12	53	183	5303	28	151

Notes:
Q_{AVG} = Average Diurnal Sewage Flow
Q_P = Total Peak Flow = Average Sewage Flow x Peaking Factor (Harmon) + Peak I/I
(1) The Pumping Station No. 4 has not been constructed and the corresponding sewershed is not serviced by the existing collection system.

2.1.4 Pipeline Inventory

Table 2.5 shows a summary of Colchester's sanitary sewer and forcemain infrastructure. The table shows that the majority of sewers are PVC (16.4 km) and reinforced concrete (RC) (6.7 km) in material. The sewer system includes 23.1 km of sanitary sewers ranging in size from less than 200 mm (8") diameter to 750 mm (30") diameter.

Table 2.5: Summary of Colchester's sanitary sewer and forcemain infrastructure

Material		Diameter	
Material	**Length (km)**	**Dia. (mm)**	**Length (km)**
Gravity Sewers			
PVC	16.4	< 200	0.04
RC	6.7	200	13.9
		250	1.3
		300	0.9
		375	0.6
		450	2.3
		525	2.2
		600	1.8
		750	0.07
TOTAL	23.1		

2.2 DESCRIPTION OF EXISITING PUMPING STATIONS

2.2.1 Overview

Pumping station No. 1 consists of a 3,660 mm diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 94.2 L/s at a TDH of 15.06 m. Additionally, the station is equipped with an ultrasonic level sensor, automatic dual-pump control, and float switch alarm installations. The sanitary system connects to pumping station No. 1 via a 750 mm ID inlet sewer located on the private Right-of-Way south of the sewage treatment facility. The sewage is pumped from PS No. 1 to the valve chamber via two (2) – 250 mm ID discharge pipes and further to the lagoon inlet distribution chamber via a 300 mm ID forcemain.

The remaining pump stations are 3,660 mm diameter precast concrete wet well type stations each equipped with two (2) submersible constant speed pumps operating as lift stations.

2.2.2 Pumping Capacity

2.2.2.1 PS Design Summary

The pumping station capacities are specified in their Environmental Compliance Approvals (ECA, formerly Certificate of Approval). A summary of the EXISTING pumps and design pumping capacity is available in **Appendix A.** Pumping station ECAs are provided in **Appendix B**. Details of the Town's sanitary pumping stations are summarized in **Table 2.6.**

Table 2.6: Pump station existing design summary

Pumping Station ID	Type	Discharge Type	Backup Power	EXISTING		
				No. of Pumps	Pumping Configuration	Design Firm Capacity
PS No.1	Wet Well Submersible	Pump (forcemain)	90 KW	2	Duty-Standby	94.2 L/s at 15.06 m TDH
PS No.2	Wet Well Submersible	Lift (sewer)	-	2	Duty-Standby	34.5 L/s at 9.88 m TDH
PS No.3	Wet Well Submersible	Lift (sewer)	-	2	Duty-Standby	6.5 L/s at 6.0 m TDH
PS No. 4	Future					
PS No.5	Wet Well Submersible	Lift (sewer)	-	2	Duty-Standby	42.4 L/s at 6.13 m TDH
PS No.6	Wet Well Submersible	Lift (sewer)	-	2	Duty-Standby	48.7 L/s at 7.92 m TDH
PS No.7	Wet Well Submersible	Lift (sewer)	-	2	Duty-Standby	52.7 L/s at 6.49 m TDH

The design basis for each of the sewage pump stations is summarized in **Table 2.7** based on the original system's design. **Table 2.7** shows that the pump stations are operating under the 1980's '20-year' design basis. The table also shows that no space was provided for future pumps; therefore, upgrading to ultimate capacity can be achieved by pump replacement or pump impeller replacement.

Table 2.7: Pump Station design basis: existing and ultimate conditions

Pumping Station ID	EXISTING		ULTIMATE	
	Pump Design Basis	No. of Pumps	No. of Future Pump Spaces Available	No. of Pumps Required for Expansion to Ultimate
PS No.1	1980's '20 – Year'	2	-	Equipment Replacement
PS No.2	1980's '20 – Year'	2	-	Equipment Replacement
PS No.3	1980's '20 – Year'	2	-	Equipment Replacement
PS No. 4	Future			
PS No.5	1980's '20 – Year'	2	-	Equipment Replacement
PS No.6	1980's '20 – Year'	2	-	Equipment Replacement
PS No.7	1980's '20 – Year'	2	-	Equipment Replacement
Notes: Pumping equipment replacement includes either pump replacement or pump impeller replacement.				

2.2.3 Overflow and Bypass

Table 2.8 provides details of the bypass locations in the sanitary sewer system. The table shows that there are no overflow locations in the sewer system and all the stations, except PS No.1, are equipped for bypassing.

Table 2.8: Pump station overflow and bypass design

Pumping Station ID	Overflow or Bypass	Sewer Dia. (mm)	Overflow Control Device	Backflow Prevention	Receiver
PS No.1	Bypass Inv. 176.90 m	400 mm	Gate Valve	Yes	Colchester Lagoon Outfall Chamber
PS No.2	Bypass Inv. 174.43 m	450 mm	-	-	-
PS No.3	Bypass Inv. 173.86 m	300 mm	-	-	-
PS No. 4	Future				
PS No.5	Bypass Inv. 179.64 m	525 mm	-	-	-

Pumping Station ID	Overflow or Bypass	Sewer Dia. (mm)	Overflow Control Device	Backflow Prevention	Receiver
PS No.6	Bypass Inv. 177.22 m	525 mm	-	-	-
PS No.7	Bypass Inv. 177.78 m	600 mm	-	-	-

2.3 DESCRIPTION OF WASTEWATER TREATMENT PLANT & METERING

2.3.1 Wastewater Treatment Facilities

The Colchester South Lagoon, an aerated facultative sewage lagoon, is located on a 12.16-hectare parcel of land in Farm Lot 82, Concession 1. The lagoon is situated approximately 500 m south of County Road 50 with access to Cornwall Beach Road. This parcel of land is separated from Lake Erie by a corridor of land occupied by permanent and summer homes. The lagoon system has a Rated Capacity of 1,816 m^3/day (21 L/s) consisting of:

- Pumping station No. 1;
- Three (3) sequentially operated cells having effective capacities of 23,385 cubic metres (primary cell), 13,974 m^3 (secondary cell) and 6,254 m^3 (tertiary cell), total depth of 5.0 m (i.e., 1.0 m freeboard, 0.3 m ice cover allowance, 3.4 m effective depth, 0.3 m sludge storage), width of all berms at the top of 3.0 m, outer and inner berm slopes of 3:1 (all inner slopes protected against erosion by a layer of crushed limestone placed over filter fabric), blanket drain (polyethylene mesh structure with geotextile on both sides) placed under the top layer of clay lining the cells throughout the bottoms and inner slopes of the cells, including blanket drain collector pipes discharging into the inlet sewer ahead of pumping station No. 1;
- Lagoon aeration system consisting of propeller aspirator type aerators mounted on two-pontoon floating assemblies anchored with a cable system to the anchor posts on the cell berms, with four (4) 7½ HP aerators fitted with "7½ HP" propellers in the primary cell, two (2) 7½ HP aerators fitted with "5 HP" propellers in the secondary cell and one (1) 7½ HP aerator fitted with "5 HP" propeller in the tertiary cell;
- Inflow distribution and flow control system, including: inlet distribution chamber, two (2) flow control chambers, outfall chamber, cell inflow and outflow pipes, and collection and by-pass sewers;
- Control building housing phosphorus removal facility, stand-by diesel generator, laboratory, and storage;
- Phosphorus removal facility, located in the control building, consisting of a 22.7 m^3 capacity chemical storage tank, two (2) diaphragm type metering pumps (one installed,

one spare) rated at 5 to 50 mL/s, and a chemical feed line to pumping station No. 1 with two alternate points of chemical feed in the wet well and in the valve chamber (pressure feed into the forcemain); and

- Outfall sewer from the lagoon system's outfall chamber to Lake Erie approximately 600 m off-shore, including valve chamber located within the treatment facility's property and a multi-port diffuser.

Table 2.11 and **Table 2.12** summarize the design criteria for the lagoon system and the phosphorus removal system.

Table 2.9: Summary of facultative lagoon design criteria

Parameter	ORIGINAL Design
Operating Configuration	Series: Cell 1 → 2 → 3
Type	Facultative
Aeration Cell 1 Cell 2 Cell 3	 4 at 7.5 Hp, 7.5 Hp Propeller ea. 2 at 7.5 Hp, 5 Hp Propeller ea. 1 at 7.5 Hp, 5 Hp Propeller
Organic Loading Rate (all cells in series operation)	170 mg BOD_5/L
Surface Area	1 0.93 ha 2 0.58 ha 3 0.30 ha TOTAL 1.81 ha
Effective Volume (btwn. d_{MIN}=0.3 m and d_{MAX}=3.7 m)	1 23,385 m^3 2 13,974 m^3 3 6,254 m^3 TOTAL 43,613 m^3
Hydraulic Retention Time (HRT) (btwn. d_{MIN}=0.3 m and d_{MAX}=3.7 m)	1 12.8 days 2 7.7 days 3 3.4 days TOTAL 23.9 days
Operating Depth	Sludge Allowance 0 m to 0.3 m Effective Zone 0.3 m to 3.7 m Ice Allowance 3.7 m to 4 m

Alum is dosed at two locations in the wastewater treatment facility. The first dosing location is immediately after pumping station No. 1, where alum is dosed to into the forcemain as it leaving the wet well. The second dosing location is in flow control chamber No. 2, prior to entering Cell 3.

The alum dosage is controlled at the Control Building of the Township of Colchester's South Direct Grant Sewage Works. The alum dosage is determined based on the runtime of the raw sewage pumps in pumping station No. 1 (RSP1 and RSP2).

Table 2.10: Summary of Phosphorus Removal Design Criteria

Parameter	ORIGINAL Design
Liquid Alum Chemical Storage Tank No. Capacity	 1 22,700 L
Chemical feed pumps No. Configuration Capacity	 2 Duty – Standby 18 – 180 L/hr, diaphragm, with variable speed drive

2.3.2 Design Flows

The Colchester lagoon is currently designed with a rated capacity (average daily sewage flow) of 1,816 m^3/day. The plant was designed for an equivalent population of 4,000 persons using a per capita average sewage flow 454 Lpcd (including extraneous flow).

The design average sewage flow is typical of current ministry design guidelines and Town Development Standards.

Table 2.11: Colchester lagoon design sewage flows

Parameter	ORIGINAL Design	ULTIMATE Design
Equiv. Population	4,000	13,322
Average Sewage Flow (m^3/d)	1,816 (21 Lps)	6,048 (70 Lps)
Harmon Peak Factor	3.34	2.83
Peak Sewage Flow (m^3/d)	8,122 (94 Lps)	28,944 (335 Lps)

2.3.3 Design WW Characteristics

The raw wastewater influent to the Colchester lagoon is primarily of domestic origin, with the exception of a few commercial sources. **Table 2.14** presents a summary of the wastewater characteristics.

Table 2.12: Colchester lagoon design wastewater characteristics

Description	Lagoon Influent Concentration (mg/L)	Lagoon Effluent Concentration (mg/L)
BOD_5	170	25
Total Suspended Solids (TSS)	200	30
Total Phosphorous (TP)	-	1

2.3.4 Treatment and Effluent Compliance Requirements

The treatment plant operates under Environmental Compliance Approval (ECA) No. 9096-7SFHHG issued May 28, 2009. A copy of the current ECA is contained in **Appendix A.** The current ECA outlines the effluent compliance limits and objectives for the facility, which are summarized in **Table 2.15.**

Table 2.13: Effluent objectives and non-compliance limits

Parameter	Non-Compliance Limits	Effluent Objectives
	Monthly Average Concentration	Concentration
cBOD5	25 mg/L	20 mg/L
TSS	30 mg/L	25 mg/L
TP	1.0 mg/L	0.8 mg/L
Total Ammonia Nitrogen	-	-
E. coli	-	-
pH	-	6.5 – 9.0 (inclusive)

2.4 DEMOGRAPHICS

Table 2.16 summarizes the population demographics for the entire Township of Colchester (including urban sanitary collection system as well as rural area). The population for the urban area serviced from the sanitary collection system would be some number less that the values reported in the table.

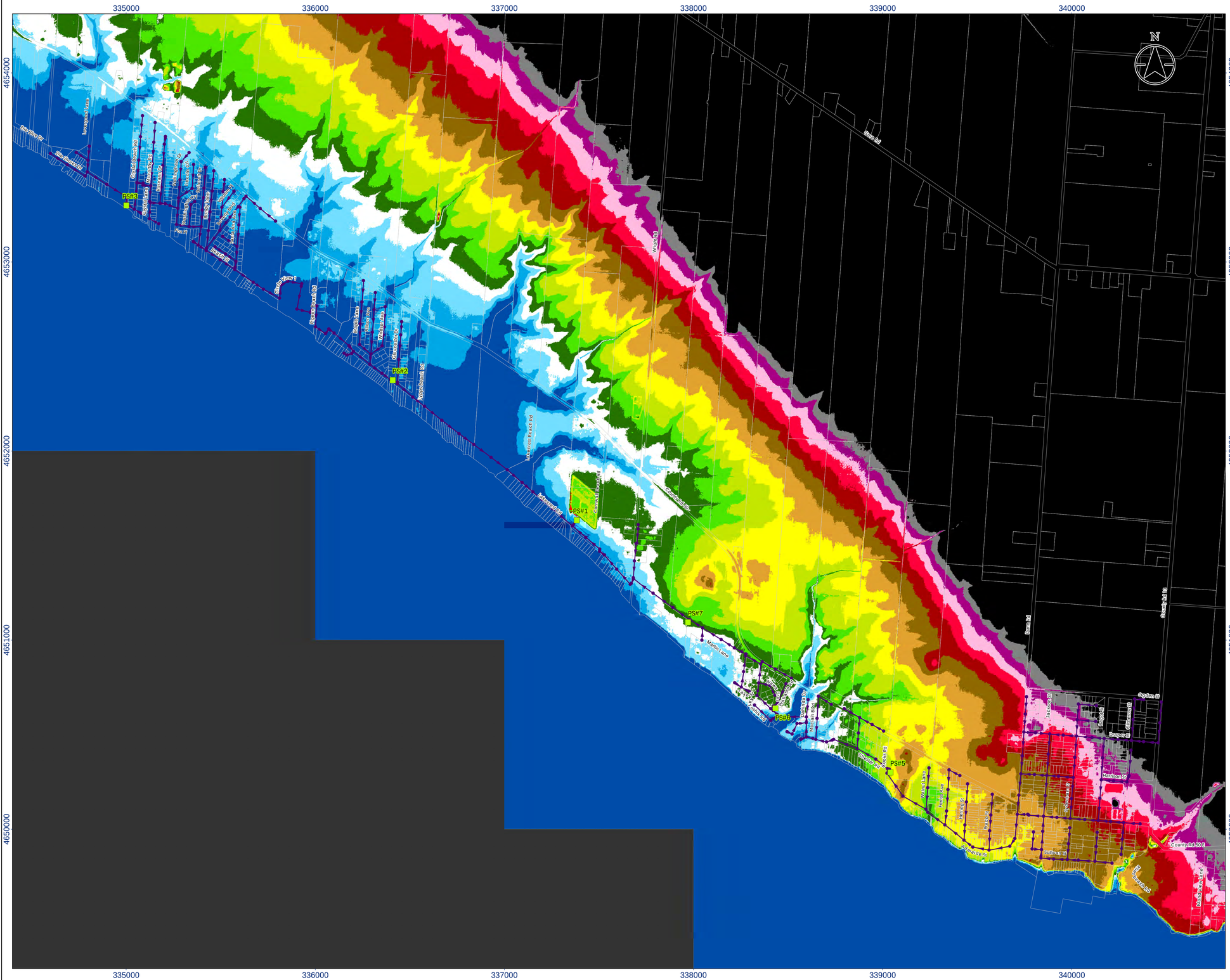
The table shows that the population in Colchester has steadily been increasing. The average dwelling size was reported to be 2.3 ppd.

Table 2.14: Township of Colchester population demographics (2006 to 2016)

Year	Population	Private Dwellings (occupied)	Avg. Dwelling Size (ppd)	% Population Change
2016	2,229	962	2.32	5.9 %
2011	2,145	917	2.34	-23.7 %
2006	2,811	-	-	-
Notes: Statistics reported from Statistics Canada				

2.5 TOPOGRAPHY

Figure 2.3 shows the topography in the Township of Colchester's urban area. The figure shows that grade is generally highest along Gore Road and tapers off towards Lake Erie on the south-west.


335000
336000
337000
338000
339000
340000
4654000
4653000
4652000
4651000
4650000
N
PS#1
PS#2
PS#3
PS#5
PS#6
PS#7
Victoria Rd
Essex 31
Jackson St
Talbot St
Harrison St
Erie St
Arthur St
Murray St
Queen St
Sherk St
Centre St
Gosfield Beach Rd
Arner Townline
Mersea Rd 1
Mersea Rd 2
Mersea Rd 3
Mersea Rd 4
Mersea Rd 5
Mersea Rd 6
Mersea Rd 7
Mersea Rd 8
Mersea Rd 9
Mersea Rd 10
Mersea Rd 11
Mersea Rd 12
Mersea Rd 13
Mersea Rd

3.0 APPROACH AND METHODOLOGY

3.1 EQUIVALENT POPULATIONS

Population was computed based on the number of private dwelling lots/units and the industrial, commercial, and institutional (ICI) establishments serviced from the sewage collection system using the 2019 aerial. Equivalent population values were calculated using the system's design basis outlined in **Section 2.1.2.**

Table 3.1: Residential dwelling equivalent persons serviced

Sewershed No.	Lot Count (2019 Aerial)			Equivalent Population	Population Density (ppha)
	Single-Family Detached Housing	Attached Housing or Mobile Parks	ICI Establishments		
1	134	-	-	436	16
2	343	160	-	1,467	29
3	34	-	-	111	8
4	0	-	-	0	0
5	436	5	8	1,500	21
6	88	-	-	286	18
7	46	-	-	150	17
Total	**1,081**	**165**	**8**	**3,948**	**-**

3.2 HYDRAULIC MODEL DEVELOPMENT

Model setup involved incorporating infrastructure, dry weather flows, and inflow and infiltration entering the sanitary sewer network into the model to represent the existing network in operation.

The analysis was performed using the PCSWMM 2019 Professional 2D software version 7.4.3220. PCSWMM utilizes the U.S. EPA SWMM5 engine (currently version 5.1.015). The approach was to populate the model with sewer infrastructure from as-built drawings, compute and input into the model dry weather flows and wet weather responses throughout the network, and assess the existing system's capacity.

A site plan of the Town's sanitary collection system in the model is shown in **Figure 3.1**.

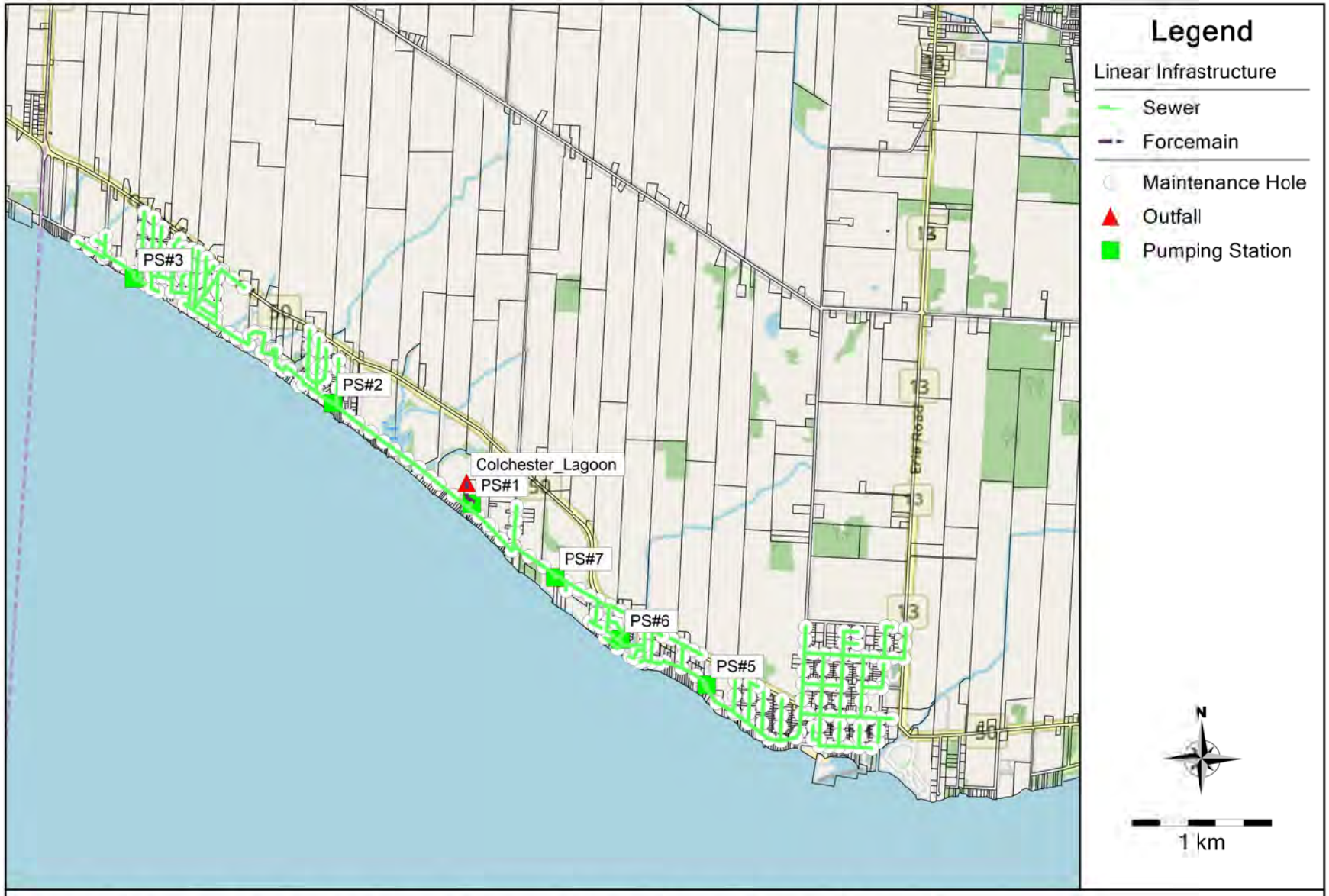


Figure 3.1: Site Plan for the Colchester Sanitary Collection System Hydraulic Model

3.3 FLOW ROUTING

Flow within a conduit was modeled numerically as unsteady flow using Dynamic Wave routing, which solves the complete Saint Venant flow equations and therefore produces the most theoretically accurate results. These equations consist of the continuity and momentum equations for conduits and a volume continuity equation at nodes.

Other hydraulic methods of analysis utilized in the model are shown in **Table 3.2**.

Table 3.2: Hydraulic methods of analysis

Item	Equation/Parameter
Flow routing	Dynamic wave with keep inertial terms
Normal flow criterion	Slope & Froude
Surcharge method	Extran
Open channel flow	Manning's equation
Manning's roughness coefficient (n) for pipes	0.013 – smooth interior wall
Pressurized pipe flow	Hazen Williams equation
Hazen Williams roughness coefficient (C)	120

4.0 CAPACITY ASSESSMENT OF SANITARY COLLECTION SYSTEM

4.1 EXISTING DEVELOPMENT - SEWAGE SERVICING ANALYSIS

4.1.1 Equivalent Population

Table 4.1 compares each pump station's cumulative area, equivalent population, and individual population density serviced under EXISTING conditions (measured based on 2019 aerial photograph) and the pumping stations current ECA DESIGN conditions.

The table shows the system-wide equivalent population serviced (3,948) is less than that of the pumping stations current design (5,090). The equivalent population is the sum of the residential population (3,878) and the ICI population (70) serviced from the sanitary collection system. Further discussion on each sewershed is included in the following section.

For reference, the Canadian Census Data for 2016 showed the Town of Colchester (rural and urban) had a population of 2,229 residents and 962 dwellings which corresponds to a density of 2.32 persons per dwelling. The measured data showed the Town of Colchester had an equivalent population of 3,878 residents, 1,246 dwellings, and a density of 3.1 persons per dwelling. The significant difference between the measured and census data may be attributed to the high number of secondary residences (ie. cottages, vacation rentals, etc.) as well as recent development in the region. For the purposes of this study the larger measured population value was used to evaluate the sanitary collection system capacity since it represents the system at its maximum potential usage.

Table 4.1: Cumulative Sewershed Service Area and Population

Pumping Station/ Sewershed No.	EXISTING (MEASURED 2019 AERIAL) Conditions			ECA P.S. DESIGN Conditions		
	Area (ha)	Equivalent Design Pop. (persons)	Individual Avg. Pop Density (ppha)	Area (ha)	Equivalent Design Pop. (persons)	Individual Avg. Pop Density (ppha)
1	190	3,948	16	185	5,090	3
2	65	1,578	29	65	1,875	18
3	14	111	8	14	325	7
4 (Future)	-	-	-	0	450	35
5	73	1,500	21	73	2,340	18
6	89	1,786	18	89	2,660	17
7	98	1,936	17	98	2,860	5
TOTAL	**190**	**3,948**	**-**	**184**	**5,090**	**-**

4.1.2 Sewage Flows

4.1.2.1 Pumping Stations

Table 4.2 compares the EXISTING peak raw sewage flow (theoretical pumping station inlet flow) and the pumping station's (PS) FIRM CAPACITY. The theoretical inlet raw sewage flows were computed from the equivalent population (MEASURED - 2019 aerial photograph) serviced under the system's design basis.

All of the pumping stations have a theoretical PEAK INLET FLOW less than the PS FIRM CAPACITY; therefore, no pumping station upgrades are required at this time.

Table 4.2: Summary of Cumulative Inlet Raw Sewage Flows at Pumping Stations

Pumping Station No.	EXISTING PEAK INLET FLOW (theoretical) (L/s)	PS FIRM CAPACITY (L/s)	% Capacity (Q_P/Q_{CAP})	Upgrade (Y or N)
1	63.2	94.2	67.1 %	N
2	24.9	34.5	72.2 %	N
3	2.0	6.5	30.8 %	N
4	-	-	-	
5	23.2	42.4	54.7 %	N
6	27.7	48.7	56.9 %	N
7	30.9	52.7	58.6 %	N

4.1.2.2 Sewer System

Figure 4.1 shows a site plan of the existing sanitary sewer system operating under peak design flow from existing development. The figure shows that all the sewers were computed to have adequate capacity (shown green in the figure).

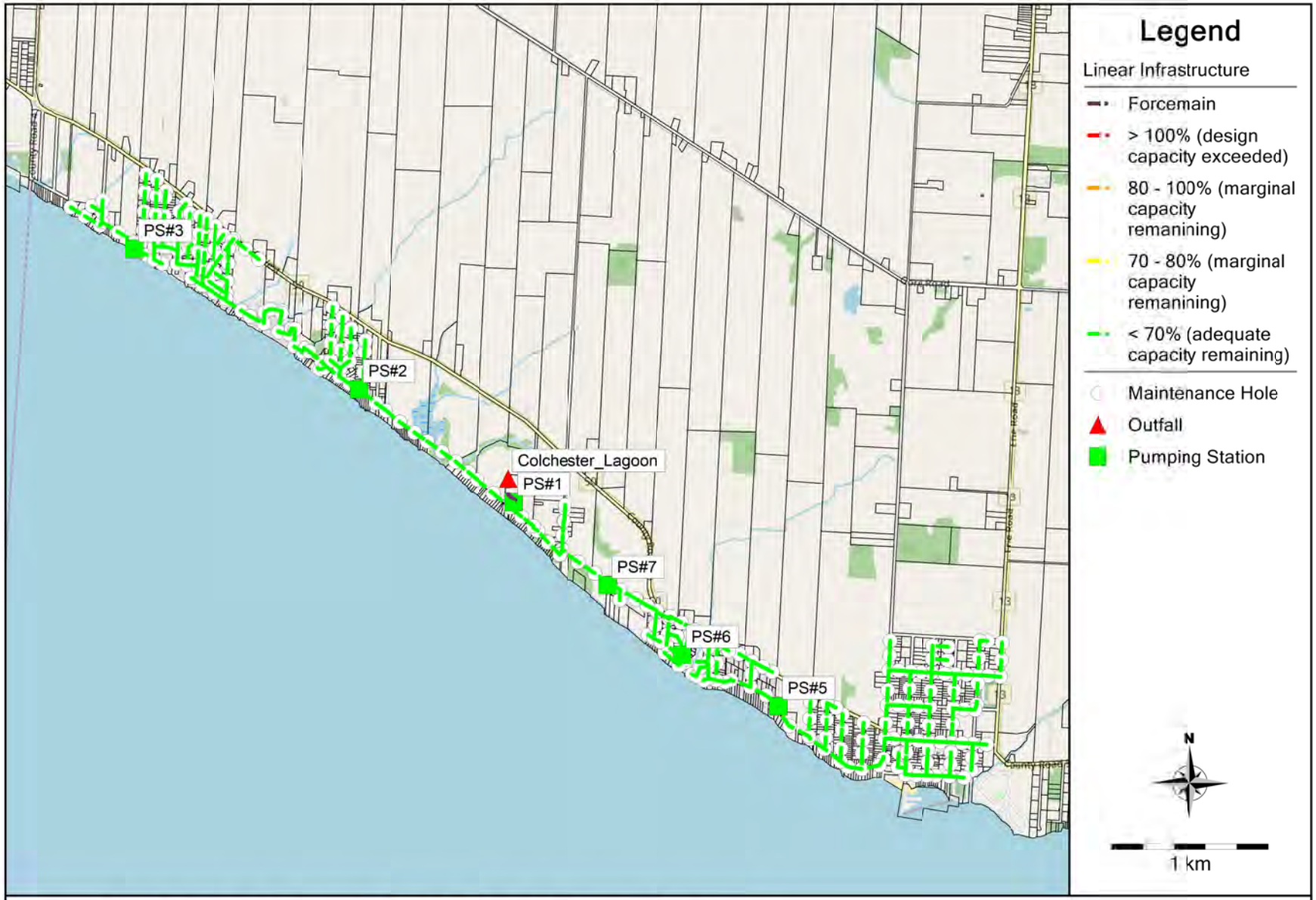


Figure 4.1: Sewer Capacity Rendering Under Peak Design Flow from Existing Development

4.2 AVAILABLE SEWAGE TREATMENT CAPACITY

Table 4.3 shows the average daily flow recorded from 2015 to 2020 at the Pumping Station No.1, the raw sewage is pumped from PS No. 1 to the Colchester WWTP. In addition, rainfall data was obtained from Environment Canada for the Windsor Airport locations rain gauge.

The table shows that in general the raw sewage flows have increased from 2015 (0.95 MLD) to 2020 (1.04 MLD). The Colchester lagoon is currently designed with a rated capacity (annual average daily flow) of 1,816 m^3/day. Based on the flow records the annual average daily flow (1,040 m^3/day) is well below the rated lagoon capacity (1,816 m^3/day).

There are periods when the peak daily flow significantly exceeds the average daily flow to the lagoons resulting in longer pump runtimes and potential sewer surcharging. This can be attributed to excessive flows during wet weather events. For example, the peak daily flow values for 2019 and 2020 occurred in the months of June and March corresponding to peak daily flow of 3,848 m^3/d and 3,468 m^3/d, respectively. During these times large wet weather events occurred with 26.1 mm of precipitation falling in less than 24 hours in June 2019 and 37.3 mm of precipitation falling in less than 24 hours in March 2020.

Table 4.3: Raw Sewage Flows Recorded at the Colchester WWTP from 2015 to 2020

Year	Annual Average Daily Flow		Peak Daily Flow		Rainfall
	(m^3/d)	(MLD)	(m^3/d)	(MLD)	(mm)
2015	953	0.95	3,560	3.56	981
2016	896	0.90	2,719	2.72	1,020
2017	1,089	1.09	4,017	4.02	1,014
2018	1,098	1.10	3,873	3.87	970
2019	1,159	1.16	3,848	3.85	815
2020	1,044	1.04	3,468	3.47	814
Average	**1,040**	**1.04**	**3,581**	**3.58**	**936**

The plant was designed for an equivalent population of 4,000 persons using a per capita average sewage flow 454 Lpcd (including extraneous flow). The measured EXISTING equivalent population based on the 2019 aerial photograph is 3,950 persons which equates to an average daily sewage flow entering the Colchester South lagoon of 1,793 m^3/d.

Based on the observed inlet raw sewage flow (recorded at PS No. 1) and the measured daily sewage flow (based on the existing equivalent population) the Colchester South lagoons rated capacity is sufficient to treat the average daily sewage flows. However, it may be insufficient during extreme wet weather events. Historical operating records have shown that meeting effluent quality requirements, particularly for total suspended solids (TSS) has been a challenge. A

thorough review of wet weather conditions and the lagoons' ability to meet effluent quality criteria would be required to determine if upgrades or process changes are required at the treatment facility.

4.3 PROJECTED DEVELOPMENT - SEWAGE SERVICING ANALYSIS

4.3.1 Equivalent Population

Table 4.4 compares each pump station's population and area serviced under the PROJECTED conditions. The projected conditions are based on the existing lot conditions (2019 ariel photograph) combined with the anticipated occupancy projections of undeveloped land from the system design basis.

The table shows the system-wide equivalent population serviced (12,797) is greater than that for the current ECA pumping stations design (5,090) and less than that of the system's piping network design (13,322). The equivalent population is the sum of the residential population (12,727) and the ICI population (70) serviced from the sanitary collection system.

The table shows that all sewersheds would be servicing equivalent population greater than the current ECA PS design populations. This is as expected since the pumping stations were designed to be upgraded with new pumps to meet future design criteria. The table shows that most of the sewersheds are servicing an equivalent population less than the piping network design populations. If the future development does not exceed the design criteria no upgrades will be required for the piping network. Further discussion on each sewershed is included in the following section.

Table 4.4: Cumulative Sewershed Service Area and Population

Pumping Station/ Sewershed No.	PROJECTED Conditions		ECA P.S. DESIGN Conditions		PIPING NETWORK DESIGN Conditions	
	Area (ha)	Equiv. Design Pop. (persons)	Area (ha)	Equiv. Design Pop. (persons)	Area (ha)	Equiv. Design Pop. (persons)
1	418	12,797	185	5,090	418	13,322
2	132	4,150	65	1,875	132	4,556
3	46	1,816	14	325	46	1,460
4	13	450	0	450	13	450
5	121	2,586	73	2,340	121	3,616
6	140	2,872	89	2,660	140	4,031
7	183	3,250	98	2,860	183	5,303
TOTAL	**418**	**12,797**	**184**	**5,090**	**418**	**13,322**

4.3.2 Sewage Flows

4.3.2.1 Pumping Stations

Table 4.5 compares the PROJECTED peak raw sewage flow (theoretical pumping station inlet flow) and the pumping station's (PS) FIRM CAPACITY. The theoretical inlet raw sewage flows were obtained at each of the pumping stations from the developed version of the PCSWMM model.

Sewershed No. 1, 2, 3, 6 and 7 have PROJECTED PEAK INLET flow that exceeded the PS FIRM CAPACITY. PS No. 5 had peak INLET flows of 99% of PS FIRM CAPACITY; however, it would still require replacement in the future to ensure the piping network works effectively. It shall be noted that all of these sewersheds still have a significant amount of area yet to be connected to the sewer system; therefore, pumping station upgrades should be completed as the areas become more developed.

Table 4.5: Summary of Cumulative Inlet Raw Sewage Flows at Pumping Stations

Pumping Station No.	PROJECTED PEAK INLET FLOW (theoretical) (L/s)	PS FIRM CAPACITY (L/s)	% Capacity (Q_P/Q_{CAP})	Upgrade (Y or N)
1	256.9	94.2	272.7 %	Y
2	68.5	34.5	198.6 %	Y
3	29.1	6.5	447.8 %	Y
4	8.8	-	-	
5	42.1	42.4	99.3 %	Y
6	57.1	48.7	117.2 %	Y
7	85.1	52.7	161.5 %	Y

4.3.2.2 Sewer System

Figure 4.2 shows a site plan of the existing sanitary sewer system operating under peak design flow from development. The figure shows that most of the sewers were computed to have adequate capacity (shown green in the figure). There were some sewers that had marginal capacity; however, they were attributed to shallow sewer grades or nearby pump stations operating near ultimate capacity.

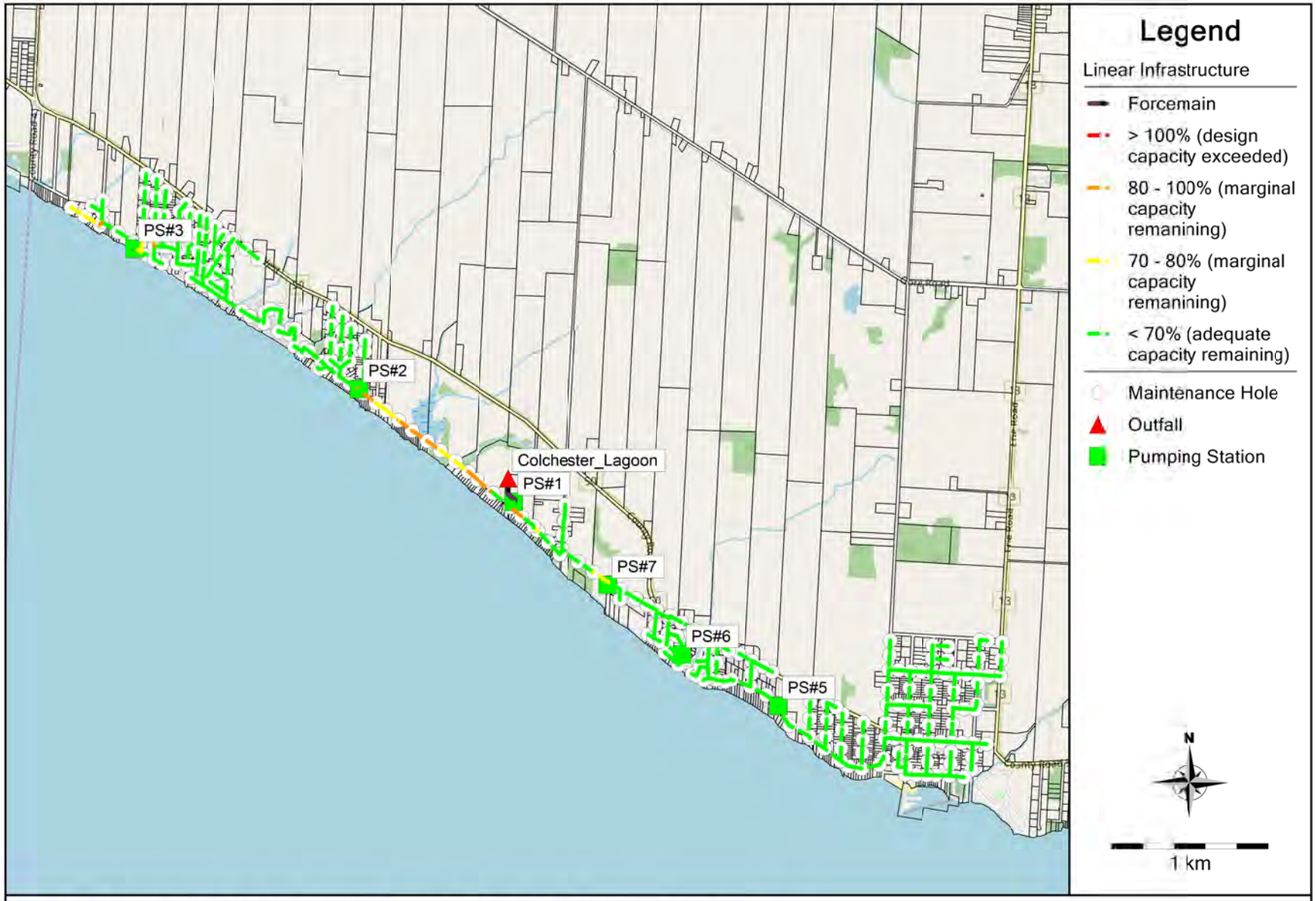


Figure 4.2: Sewer Capacity Rendering Under Peak Design Flow from Proposed Development

4.4 FUTURE SERVICING PLAN

The population equivalents for the future service area in each sewershed are shown in **Table 4.6** and **Table 4.7** for the pumping stations and sewer piping network, respectively. **Figure 2.2** shows the areas designated for future servicing based on the information available at the time of study**.** The existing service area is approximately 169 hectares smaller than the ultimate design basis.

The cumulative equivalent populations presented in **Table 4.6** must be maintained within each sewershed to meet the sanitary system's design basis for the pumping capacity. Development above the design population (i.e. exceeding the remaining population) would result in the need for pumping station upgrades.

Based on the measured cumulative equivalent populations all of the pumping stations are servicing less than their ultimate service population. Under the current conditions none of the pumping stations require a pumping upgrade. The development and equivalent population in the area serviced by Pumping Station No. 1 has exceeded the original design; however, this is offset by the underdevelopment of the remaining sewershed areas.

Table 4.6: Future Servicing Plan for Pumping Stations

Pumping Station No.	Cumulative Equivalent Population (persons)			Individual Equivalent Population (persons)		
	Design (EXISTING) (+)	Measured (EXISTING) (-)	Remaining (FUTURE) (=)	Design (EXISTING) (+)	Measured (EXISTING) (-)	Remaining (FUTURE) (=)
1	5,090	3,950	1,140	355	436	-81
2	1,875	1.578	297	1,550	1,467	83
3	325	111	214	325	111	214
4	450	0	450	450	0	450
5	2,340	1,500	840	1,890	1,500	390
6	2,660	1,786	874	320	286	34
7	2,860	1,936	924	200	150	50
TOTAL	**-**	**-**	**-**	**5,090**	**3,950**	**1,140**

The remaining population equivalents and corresponding allowable population densities presented in **Table 4.7** must be maintained to meet the sanitary system's design basis for the available conveyance capacity. Development for a larger population would result in a less conservative design basis. Based on the measured equivalent populations all of the sewersheds piping networks are servicing significantly less than their ultimate service population; therefore, no upgrades are required.

Table 4.7: Future Servicing Plan for Sewer Piping Network

Sewershed No.	Individual Equivalent Population (persons)			Undeveloped Area (ha)	Population Density (ppha)
	Ultimate Design (+)	Measured (EXISTING) (-)	Remaining (FUTURE) (=)	Remaining (FUTURE)	Allowable (FUTURE)
1	3,463	436	3,027	76	39.8
2	3,096	1,467	1,629	19	85.7
3	1,460	111	1,349	24	56.2
4	450	0	450	13	34.6
5	3,166	1,500	1,666	18	92.6
6	415	286	129	2	64.5
7	1,272	150	1,122	17	66.0
TOTAL	**13,322**	**3,950**	**9,372**	**-**	**-**

5.0 SUMMARY

Table 5.1 summarizes the findings of the capacity assessment of the Colchester South sanitary collection system. The current calculated population in the region is approximately 3,948 residents; therefore, no pumping station (capacity = 5,090 residents), piping network (capacity = 13,322 residents), or WWTP (capacity = 4,000 residents) upgrades are required at this time. As the region becomes more developed, pumping station and WWTP upgrades will be required.

Column No. 1 shows the existing population based on the system design basis and the number of private / ICI lots from the 2019 aerial photograph. Column No. 2 shows the cumulative population at each pumping station which would require or 'trigger' a pumping station upgrade. Pumping station upgrades for PS No. 1, 2, 3, 5, 6, and 7 would include replacing the pumps and/or pump impeller. Whereas, pumping station upgrades for sewershed No. 4 would include building a new pumping station and expanding the collection system. Column No. 3 shows the capacity of the pipe network; development for a larger population would result in a less conservative design basis. Column No. 4 shows the undeveloped area remaining in the region and Column No. 5 shows the allowable population density within these areas. The pipe network would not require upgrades given that the allowable population densities presented are followed.

Table 5.1: Summary of Upgrade Triggers

Column:	1	2	3	4	5
Pumping Station No.	**EXISTING POPULATION**	**POPULATION TRIGGERING PS UPGRADE**	**PIPE NETWORK CAPACITY**	**UNDEVELOPED AREA REMAINING**	**ALLOWABLE FUTURE POPULATION DENSITY**
	Cumulative Population (persons)	Cumulative Population (persons)	Cumulative Population (persons)	Individual Area (ha)	Population Density (ppha)
1	3,948	5,090	13,322	76	39.8
2	1,578	1,875	4,556	19	85.7
3	111	325	1,460	24	56.2
4	-	450	450	13	34.6
5	1,500	2,340	3,616	18	92.6
6	1,786	2,660	4,031	2	64.5
7	1,936	2,860	5,303	17	66.0
TOTAL	**3,948**	**5,090**	**13,322**	**-**	**-**

APPENDICES

Appendix A PUMPING STATION INFRASTRUCUTRE

A.1 PUMPING EQUIPMENT

Table B1: Summary of existing pump station pumping equipment

Pumping Station ID	Year Installed	No.1		No.2	
		Model	Driver	Model	Driver
PS No.1	2020	Flygt NP 3171.095 MT	600 V / 3 / 60 hz 18.64 kW 1760 rpm	Same	Same
PS No.2	1988	Flygt NP 3127.060 MT	600 V / 3 / 60 hz 7.46 kW 1745 rpm	Same	Same
PS No.3	1988	Flygt NP 3085.183 MT	230 V / 1 / 60 hz 1.79 kW 1710 rpm	Same	Same
PS No.4	-	-	-	-	-
PS No.5	1988	Flygt NP 3127.980 MT	600 V / 3 / 60 hz 5.52 kW 1755 rpm	Same	Same
PS No.6	1988	Flygt CP 3127.180 LT	600 V / 3 / 60 hz 7.46 kW 1735 rpm	Same	Same
PS No.7	1988	Flygt CP 3127.180 MT	600 V / 3 / 60 hz 7.46 kW 1735 rpm	Same	Same
Notes:					

Appendix B ENVIRONMENTAL COMPLIANCE APPROVALS (ECA)

CONTENT COPY OF ORIGINAL

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED CERTIFICATE OF APPROVAL
MUNICIPAL AND PRIVATE SEWAGE WORKS
NUMBER 9 6-7D9
Issue Date: May 2, 2008

The Corporation of the Town of Essex
33 Talbot St S
Essex, Ontario
N8M 1A8

Site Location: Colchester South Lagoon
Lot 82, Concession 1
Essex Town, County of Essex

You have applied in accordance with Section 53 of the Ontario Water Resources Act for approval of:

Alterations to the existing municipal sewage works for the collection, transmission, treatment and disposal of sewage, having a *Rated Capacity* of 1,816 m^3/d and consisting of the following:

PROPOSED WORKS

Sewage Treatment Facilities

- Pilot Project - Experimental Operating Procedure for the period from April 1 to October 31 only, during which the effluent from the primary cell may be discharged directly to the tertiary cell, bypassing the secondary cell;

EXISTING WORKS

Sanitary Sewers

- sanitary sewers and appurtenances, including stub sewer connections and building sewers from the main sewer to the street line on Maple Boulevard, Lane approx. 530 m south of County Road No. 50, Easement approx. 380 m south of County Road No. 50, McCarthy Beach Road (private Right-of-Way), Lane approx. 535 m south of County Road No. 50, Easement approx. 460 m south of County Road No. 50, Nottingham Drive, Lincoln Court, Fox Place, Washington Court, Bellcroft Drive, Right-of-Way approx. 100 m south of Fox Place, Ambassador Drive (private drive), Private road approx. 40 m south of Lakeview Avenue, Beverly Boulevard, Santa Ana Avenue, Lakeview Avenue, Sunset Avenue, Santa Monica Blvd., Wilshire Place, Circle V-1 Road (private road), Pleasure Beach Road (private road), Circle V-2 Road (private road), Pigeon Beach Road (private Right-of-Way), Easement just north of Lakeview Avenue, Lakeview Avenue (including the easement extending to the east and the east extension of Cumberland Way), Allison Avenue, Maple Avenue, Windsor Avenue, Cumberland Way (including west extension), Gloucester Drive (Argyle Beach Road), Private Right-of-Way approx. 500 m south of County Road No. 50 (Lots 82 to 86, Conc. 1), Private Right-of-Way approx. 500 m south of County Road No. 50 (Lots 81 & 82, Conc. 1), Wright Road, Easement approx. 600 m south of County Road No. 50 (Lots 77 to 79, Conc. 1), Easement approx. 600 m south of County Road No. 50 (Lots 79 & 80, Conc. 1), Easement approx. 260 m west of Marsden Ave., County Road No. 50, Marsden Avenue, Shawondasee Boulevard, Wabasso Road, Right-of-Way approx. 45 m east of Wabasso Rd., Kayoshk Road, Wawa Crescent, Easement in Tawasentha Park, Dahinda Drive, Easement approx. 55 m west of McClain Boulevard, Victoria Avenue, McClain Boulevard, Chester Road, Private Right-of-Way approx. 185 m east of Westchester Road, Easement approx. 25 m south of Chester Road, Westchester Road, Walnut Lane (private Right-of-Way), Adelaide Street, Prado Avenue, Herring Avenue, Ferris Avenue;

Sewage Pumping Stations

- pumping station No. 5, located on the private Right-of-Way approx. 185 m east of Westchester Road at the intersection

with Chester Road, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 42.4 litres per second at a TDH of 6.13 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations, an inlet sewer from, and an outlet sewer to, the sewer located on the private Right-of-Way approx. 185 m east of Westchester Road;

- pumping station No. 6, located at the intersection between Shawondasee Boulevard and Wabasso Road, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 48.7 litres per second at a TDH of 7.92 metres, including sonic level sensor automatic dual-pump control, and float switch alarm installations, an inlet sewer from the sewer located on Shawondasee Boulevard and an outlet sewer to the sewer located on Wabasso Rd.;

- pumping station No. 7, located on the easement approx. 600 m south of County Road No. 50, approx. 50 m west of Marsden Avenue, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 52.7 litres per second of a TDH of 6.49 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations inlet sewer from, and outlet sewer to, the sewer located on the easement approx. 600 m south of County Road No.50;

- pumping station No. 2, located on the west extension of Cumberland Way, approx. 25 m west of Gloucester Drive, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 34.5 litres per second at a TDH of 9.88 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations, inlet sewer from, and outlet sewer to, the sewer located on the west extension of Cumberland Way;

Sewage Treatment Facilities

aerated facultative sewage lagoon located on Lot 82, concession 1, to the north of the private Right-of-Way approx. 500 m south of County Road No. 50 and to the west of Cornwall Beach Road, having a *Rated Capacity* of 1,816 m^3/d and consisting of:

- pumping station No. 1, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 94.2 litres per second at a TDH of 15.06 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations, inlet sewer from the sewer located on the private Right-of-Way south of the sewage treatment facilities, valve chamber discharge pipes from the pumps to the valve chamber, and forcemain from the valve chamber to the lagoon inlet distribution chamber;

- three (3) sequentially operated cells having effective capacities of 23,385 cubic metres (primary cell), 13,974 cubic metres (secondary cell) and 6,254 cubic metres (tertiary cell), total depth of 5.0 metres (i.e., 1.0 m freeboard, 0.3 m ice cover allowance, 3.4 m effective depth, 0.3 m sludge storage), width of all berms at the top of 3.0 metres, outer and inner berm slopes of 3:1 (all inner slopes protected against erosion by a layer of crushed limestone placed over filter fabric), blanket drain (polyethylene mesh structure with geotextile on both sides) placed under the top layer of clay lining the cells throughout the bottoms and inner slopes of the cells, including blanket drain collector pipes discharging into the inlet sewer ahead of pumping station No. 1;

- lagoon aeration system consisting of propeller aspirator type aerators mounted on two-pontoon floating assemblies anchored with a cable system to the anchor posts on the cell berms, with four (4) 7½ HP aerators fitted with "7½ HP" propellers in the primary cell, two (2) 7½ HP aerators fitted with "5 HP" propellers in the secondary cell and one (1) 7½ HP aerator fitted with "5 HP" propeller in the tertiary cell;

- inflow distribution and flow control system, including: inlet distribution chamber, two (2) flow control chambers, outfall chamber, cell inflow and outflow pipes, and collection and by-pass sewers;

- control building housing phosphorus removal facility, stand-by diesel generator, laboratory and storage;

- phosphorus removal facility, located in the control building, consisting of a 22.7 cubic metre capacity liquid alum/ferric chloride storage tank, two (2) diaphragm type metering pumps (one installed, one spare) rated at 5 to 50 millilitres per second, and a chemical feed line to pumping station No. 1 with two alternate points of chemical feed in the wet well and in the valve chamber (pressure feed into the forcemain;

- outfall sewer from the lagoon system's outfall chamber to Lake Erie approx. 600 metres off-shore, including valve chamber located within the treatment facility's property and a multi-port diffuser;

Miscellaneous

- all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works;

all in accordance with the following submitted supporting documents:

1. applications dated July 24, 1985 (preliminary), February 15, 1988 (Contract 3), February 24 (Contracts 5 and 6), March 7, 1988 (Contract 1), and March 31, 1988 (Contract 2), and all associated plans and specifications prepared and submitted by LaFontaine, Cowie, Buratto & Associates Limited;
2. Application for Approval of Municipal and Private Sewage Works submitted by Dino Buratto of Stantec Consulting Ltd. received March 4, 2008 for the Pilot Project - Experimental Operating Procedures and subsequent email correspondence dated March 25, 2008 and March 28, 2008.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

"*Act*" means the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended;

""*Average Daily Flow*" means the cumulative total sewage flow to the sewage works during a calendar year divided by the number of days during which sewage was flowing to the sewage works that year;

"*BOD5*" (also known as TBOD5) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demand;

"*By-pass"* means any discharge from the *Works* that does not undergo any treatment or only receives partial treatment before it is discharged to the environment;

"*CBOD5*" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;

"*Certificate*" means this entire certificate of approval document, issued in accordance with Section 53 of the *Act*, and includes any schedules;

"*Daily Concentration*" means the concentration of a contaminant in the effluent discharged over any single day, as measured by a composite or grab sample, whichever is required;

"*Director*" means any *Ministry* employee appointed by the Minister pursuant to section 5 of the *Act*;

"*District Manager*" means the District Manager of the Windsor District Office of the Ministry;

"Existing Works" means those portions of the sewage works previously constructed and existing on-site on the date of issuance of this *Certificate*;

"*Ministry*" means the Ontario Ministry of the Environment;

"*Monthly Average Concentration*" means the arithmetic mean of all *Daily Concentrations* of a contaminant in the effluent sampled or measured, or both, during a calendar month;

"*Monthly Average Daily Flow*" means the cumulative total sewage flow to the sewage works during a calendar month divided by the number of days during which sewage was flowing to the sewage works that month;

"*Owner*" means The Corporation of the Town of Essex and includes its successors and assignees;

"Proposed Works" means the sewage works described in the *Owner*'s application, this *Certificate* and in the supporting documentation referred to herein, to the extent approved by this *Certificate*;

"*Rated Capacity*" means the *Average Daily Flow* for which the *Works* are approved to handle;

"*Regional Director*" means the Regional Director of the Southwestern Region of the Ministry; and

"*Works*" means the sewage works described in the *Owner*'s application, this *Certificate* and in the supporting documentation referred to herein, to the extent approved by this *Certificate* and includes both *Existing Works* and *Proposed Works*.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

(1) The *Owner* shall ensure that any person authorized to carry out work on or operate any aspect of the *Works* is notified of this *Certificate* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Except as otherwise provided by these Conditions, the *Owner* shall design, build, install, operate and maintain the *Works* in accordance with the description given in this *Certificate*, the application for approval of the works and the submitted supporting documents and plans and specifications as listed in this *Certificate*.

(3) Where there is a conflict between a provision of any submitted document referred to in this *Certificate* and the Conditions of this *Certificate*, the Conditions in this *Certificate* shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

(4) Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(5) The requirements of this *Certificate* are severable. If any requirement of this *Certificate*, or the application of any requirement of this *Certificate* to any circumstance, is held invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this certificate shall not be affected thereby.

(6) The approval granted by this *Certificate* is based upon a review of the *Works* in the context of its effect on the environment, its process performance and general principles of wastewater engineering. The review did not include a consideration of the architectural, mechanical, electrical or structural components and minor details of the *Works* except to the extent necessary to review the *Works*.

2. EXPIRY OF APPROVAL

The approval for the Pilot Project - Experimental Operating Procedure issued by this *Certificate* will cease to apply to when the recorded *Monthly Average Daily Flow* to the sewage treatment facilities exceed 1,200 m^3/d.

3. CHANGE OF OWNER

(1) The *Owner* shall notify the *District Manager* and the *Director*, in writing, of any of the following changes within 30 days of the change occurring:

(a) change of *Owner*;

(b) change of address of the *Owner*;

(c) change of partners where the *Owner* is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c.B17 shall be included in the notification

to the *District Manager*;

(d) change of name of the corporation where the *Owner* is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Informations Act, R.S.O. 1990, c. C39 shall be included in the notification to the *District Manager*;

(2) In the event of any change in ownership of the *Works*, other than a change to a successor municipality, the *Owner* shall notify in writing the succeeding owner of the existence of this *Certificate*, and a copy of such notice shall be forwarded to the *District Manager* and the *Director*.

4. RECORD DRAWINGS

(1) A set of as-built drawings showing the works "as constructed" shall be kept up to date through revisions undertaken from time to time and a copy shall be retained at the *Works* for the operational life of the *Works*.

5. BY-PASSES

(1) Any *By-pass* of sewage from any portion of the *Works* is prohibited, except where:

(a) it is permitted under the Pilot Project - Experimental Operating Procedure for the period from April 1 to October 31 only, during which the effluent from the primary cell may be discharged directly to the tertiary cell, bypassing the secondary cell;

(b) it is necessary to avoid loss of life, personal injury, danger to public health or severe property damage;

(c) the *District Manager* agrees that it is necessary for the purpose of carrying out essential maintenance and the *District Manager* has given prior written acknowledgment of the *by-pass*; or

(d) the *Regional Director* has given prior written acknowledgment of the *By-pass*.

(2) The *Owner* shall collect at least one (1) grab sample of the *By-pass* and have it analyzed for the parameters outlined in Condition 7 using the protocols in Condition 9.

(3) The *Owner* shall maintain a logbook of all *By-pass* events which shall include, at a minimum, the time, location, duration, quantity of *By-pass*, the authority for *By-pass* pursuant to subsection (1), and the reasons for the occurrence.

6. EFFLUENT OBJECTIVES

(1) The *Owner* shall use best efforts to design and operate the *Works* with the objective that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the *Works*.

Table 1 - Effluent Objectives

Effluent Parameter	Concentration Objective (milligrams per litre unless otherwise indicated)
CBOD5	20.0
Total Suspended Solids	25.0
Total Phosphorus	0.8

(2) The *Owner* shall use best efforts to:

(a) maintain the pH of the effluent from the *Works* within the range of 6.5 - 9.0, inclusive, at all times;

(b) operate the works within the *Rated Capacity* of the *Works*;

(c) ensure that the effluent from the *Works* is essentially free of floating and settleable solids and does not

contain oil or any other substance in amounts sufficient to create a visible film or sheen or foam or discolouration on the receiving waters.

(3) The *Owner* shall include in all reports submitted in accordance with Condition 10 a summary of the efforts made and results achieved under this Condition.

7. EFFLUENT LIMITS

(1) The *Owner* shall design and operate and maintain the *Works* such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the *Works*.

Table 2 - Effluent Limits

Effluent Parameter	Average Concentration (milligrams per litre unless otherwise indicated)
CBOD5	25.0
Total Suspended Solids	30.0
Total Phosphorus	1.0

(2) For the purposes of determining compliance with and enforcing subsection (1):

(a) The *Monthly Average Concentration* of a parameter named in Column 1 of subsection (1) shall not exceed the corresponding maximum concentration set out in Column 2 of subsection (1).

(3) Subsection (2) shall apply upon the issuance of this *Certificate.*

8. OPERATION AND MAINTENANCE

(1) The *Owner* shall exercise due diligence in ensuring that, at all times, the *Works* and the related equipment and appurtenances used to achieve compliance with this *Certificate* are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate operator staffing and training, including training in all procedures and other requirements of this *Certificate* and the *Act* and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the *Works*.

(2) The *Owner* shall prepare an operations manual, that includes, but not necessarily limited to, the following information:

(a) operating procedures for routine operation of the *Works*;

(b) inspection programs, including frequency of inspection, for the *Works* and the methods or tests employed to detect when maintenance is necessary;

(c) repair and maintenance programs, including the frequency of repair and maintenance for the *Works*;

(d) procedures for the inspection and calibration of monitoring equipment;

(e) a spill prevention control and countermeasures plan, consisting of contingency plans and procedures for dealing with equipment breakdowns, potential spills and any other abnormal situations, including notification of the *District Manager*; and

(f) procedures for receiving, responding and recording public complaints, including recording any followup actions taken.

(3) The *Owner* shall maintain the operations manual current and retain a copy at the location of the *Works* for the

operational life of the *Works*. Upon request, the *Owner* shall make the manual available to *Ministry* staff.

(4) The *Owner* shall provide for the overall operation of the *Works* with an operator who holds a licence that is applicable to that type of facility and that is of the same class as or higher than the class of the facility in accordance with Ontario Regulation 129/04.

9. MONITORING AND RECORDING

The *Owner* shall, upon commencement of operation of the *Works*, carry out the following monitoring program:

(1) All samples and measurements taken for the purposes of this *Certificate* are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) For the purposes of this condition, the following definitions apply:

(a) Daily means once each day;
(b) 3/Week means three times each week;
(c) Weekly means once each week;
(d) Monthly means once every month;

(3) Samples shall be collected at the following sampling points, at the frequency specified, by means of the specified sample type and analyzed for each parameter listed and all results recorded:

Table 3 - Influent Monitoring	
Frequency	Monthly
Sample Type	Composite
Parameters	*BOD5*, Total Suspended Solids, Total Phosphorus

Table 4 - Effluent Monitoring under normal operating procedure - discharge from tertiary cell		
Parameters	**Sample Type**	**Frequency**
CBOD5	Composite	Weekly
Total Suspended Solids	Composite	Weekly
Total Phosphorus	Composite	Weekly
pH	Grab	Weekly
Temperature	Grab	Weekly
Alkalinity	Grab	Weekly

Table 5 - Effluent Monitoring under experimental operating procedure - discharge from primary cell and tertiary cell		
Parameters	**Sample Type**	**Frequency**
CBOD5	Composite	Weekly
Total Suspended Solids	Composite	3/Week
Total Phosphorus	Composite	Weekly
pH	Grab	Daily
Temperature	Grab	Daily
Alkalinity	Grab	Daily

CONTENT COPY OF ORIGINAL

(4) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's Procedure F-10-1, “Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended from time to time by more recently published editions;

(b) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

(c) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions;

(5) The measurement frequencies specified in subsection (3) in respect to any parameter are minimum requirements which may be modified by the *District Manager* in writing from time to time.

(6) The *Owner* shall install and maintain continuous flow measuring device, to measure the flowrate of the influent to or effluent from the *Works* with an accuracy to within plus or minus 15 per cent (+/- 15%) of the actual flowrate for the entire design range of the flow measuring device, and record the flowrate at a daily frequency.

10. REPORTING

(1) One week prior to the start up of the operation of the Pilot Project - Experimental Operating Procedure, the *Owner* shall notify the *District Manager* (in writing) of the pending start up date.

(2) Ten (10) days prior to the date of a planned *By-pass* being conducted pursuant to Condition 5 and as soon as possible for an unplanned *By-pass*, the *Owner* shall notify the *District Manager* (in writing) of the pending start date, in addition to an assessment of the potential adverse effects on the environment and the duration of the *By-pass*.

(3) The *Owner* shall report to the *District Manager* or designate, any exceedence of any parameter specified in Condition 7 orally, as soon as reasonably possible, and in writing within seven (7) days of the exceedence.

(4) In addition to the obligations under Part X of the Environmental Protection Act, the *Owner* shall, within 10 working days of the occurrence of any reportable spill as defined in Ontario Regulation 675/98, bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the *District Manager* describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

(5) The *Owner* shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to *Ministry* staff.

(6) The *Owner* shall prepare, and submit to the *District Manager,*a performance report, on an annual basis, within ninety (90) days following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the *Works* and subsequent reports shall be submitted to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

(a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7, including an overview of the success and adequacy of the *Works*;

(b) a description of any operating problems encountered and corrective actions taken;

(c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the *Works*;

(d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;

(e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment; and

(f) a description of efforts made and results achieved in meeting the Effluent Objectives of Condition 6.

(g) a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;

(h) a summary of any complaints received during the reporting period and any steps taken to address the complaints;

(i) a summary of all *By-pass*, spill or abnormal discharge events; and

(j) any other information the *District Manager* requires from time to time.

(7) The *Owner* shall submit to the *Regional* Director and *District Manager* on a weekly basis, all pertinent information and monitoring results when the sewage treatment facilities are operated under Experimental Operating Procedure and within one week of these information becoming available.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the *Works* are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the *Certificate* and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this *Certificate* the existence of this *Certificate*.

2. Condition 2 is included to ensure that the Experimental Operating Procedure is only used during relatively warm seasonal period and under low flow condition.

3. Condition 3 is included to ensure that the *Ministry* records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the *Works* are made aware of the *Certificate* and continue to operate the *Works* in compliance with it.

4. Condition 4 is included to ensure that record drawings of the *Works* “as constructed” are maintained for future references.

5. Condition 5 is included to indicate that by-passes of untreated sewage to the receiving watercourse is prohibited, save in certain limited circumstances where the failure to *By-pass* could result in greater injury to the public interest than the *By-pass* itself where a *By-pass* will not violate the approved effluent requirements, or where the *By-pass* can be limited or otherwise mitigated by handling it in accordance with an approved contingency plan. The notification and documentation requirements allow the *Ministry* to take action in an informed manner and will ensure the *Owner* is aware of the extent and frequency of *By-pass* events.

6. Condition 6 is imposed to establish non-enforceable effluent quality objectives which the *Owner* is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits of Condition 6 are exceeded..

7. Condition 7 is imposed to ensure that the effluent discharged from the *Works* to Lake Erie meets the *Ministry*'s effluent quality requirements thus minimizing environmental impact on the receiver and to protect water quality, fish and other aquatic life in the receiving water body.

8. Condition 8 is included to require that the *Works* be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the owner and made available to the *Ministry*. Such a manual is an integral part of the operation of the *Works*. Its compilation and use should assist the *Owner* in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as

CONTENT COPY OF ORIGINAL

a benchmark for *Ministry* staff when reviewing the *Owner's* operation of the work.

9. Condition 9 is included to enable the *Owner* to evaluate and demonstrate the performance of the *Works*, on a continual basis, so that the *Works* are properly operated and maintained at a level which is consistent with the design objectives and effluent limits specified in the *Certificate* and that the *Works* does not cause any impairment to the receiving watercourse.

10. Condition 10 is included to provide a performance record for future references, to ensure that the *Ministry* is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this *Certificate,* so that the *Ministry* can work with the *Owner* in resolving any problems in a timely manner.

This Certificate of Approval revokes and replaces Certificate(s) of Approval No. 3-0949-85-886 issued on May 18, 1988.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Section 53, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted sewage works are approved under Section 53 of the Ontario Water Resources Act.

DATED AT TORONTO this 12th day of May, 2008

Mansoor Mahmood, P.Eng.
Director
Section 53, *Ontario Water Resources Act*

FL/
c: District Manager, MOE Windsor
Dino Buratto, Stantec Consulting Ltd.
Water Standards Section, MOE Standards Development Branch

APPENDIX C: ASSIMILATIVE CAPACITY STUDY

1. Assimilative Capacity Study Report, Colchester South Sewage Works

Assimilative Capacity Study
Colchester South Sewage Works, Colchester South Community, Town of Essex

Final Report

April 14, 2023

Prepared for:

Town of Essex

33 Talbot Street
Essex, ON N8M 1A8

Prepared by:

Stantec Consulting Ltd.

Revision	Description	Author	Quality Check	Independent Review
0	Draft	Igor Iskra	Chrissy Jung	Jian Li
1	Final	Igor Iskra	Hannah Rindlisbacher	Jian Li



This document entitled Assimilative Capacity Study Colchester South Sewage Works, Colchester South Community, Town of Essex was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Town of Essex (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared and Approved by _____
(signature)
Dr. Igor Iskra, P.Eng., Senior Water Resource Engineer

Reviewed by _____
(signature)
Dr. Jian Li, P.Eng., PE, Senior Environmental Engineer

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Executive Summary

This assimilative capacity study (ACS) describes the approach and results of the dilution mixing assessment of Lake Erie in response to the effluent being discharged from the Colchester South Sewage Works servicing the Colchester South Community of the Town of Essex. The Town of Essex proposes to expand the plant capacity from 1,816 m^3/day to a 20-year design flow of 3,600 m^3/day to serve the existing needs and future growth requirements of the Colchester South Community.

This ACS comprises of six (6) Sections and two (2) Appendices. Section 1 provides introduction and study objectives. Section 2 discusses background information, proposed plant expansion, regulatory framework, and study approach. Section 3 presents ambient hydrodynamic conditions and receiver water quality as well as effluent characteristics. Section 4 presents modeling results and discussion. Section 5 provides study conclusions and Section 6 lists cited references.

Abbreviations

°C	degrees Celsius
7Q20	seven-day average low flow that can be expected once in 20 years
ACS	assimilative capacity study
BOD	biochemical oxygen demand
$CBOD_5$	carbonaceous biochemical oxygen demand
CFU	colony-forming unit
ECA	environmental compliance approval
IGLD	International Great Lakes Datum
m^3	cubic metres
m^3/d	cubic metres per day
mg/L	milligrams per litre
MECP	Ministry of the Environment, Conservation and Parks, formerly known as MOECC, MOE
MPN	Most Probable Number
PWQO	Provincial Water Quality Objectives
TP	total phosphorus
TSS	total suspended solids

1.0 INTRODUCTION AND STUDY OBJECTIVES

This report describes the approach and results of the assimilative capacity study of Lake Erie in response to the anticipated effluent to be discharged from the proposed Colchester South Sewage Works expansion servicing Colchester South Community of the Town of Essex.

The expansion of the existing Colchester South Sewage Works is required to meet demands from significant development pressures within the service area. This report will support a Class Environmental Assessment (Class EA) to expand and upgrade the existing Colchester South Sewage Works.

The Colchester South Sewage Works consists of sanitary sewers, pumping stations, sewage treatment lagoons (primary, secondary and tertiary cells) and an outfall to Lake Erie approximately 600 metres offshore. The location of the sewage works, and outfall pipe is shown on **Figure 1**.

The Colchester South Sewage Works is operated under the Amended Certificate of Approval (C of A) #9096-7SFHHG (dated May 28, 2009). The C of A is currently referred to as an Environmental Compliance Approval (ECA). The rated capacity of the facility is 1,816 m^3/d (21 L/s). The existing ECA regulates effluent limits and objectives for total phosphorus (TP), carbonaceous biological oxygen demand (CBOD5), total suspended solids (TSS) and pH.

Effluent from the existing lagoon is discharged to a multi-port outfall located about 600 meters offshore in Lake Erie. The diffuser has 7 ports in the end section of the outfall to assist in dispersing the effluent. It is our understanding that ports 1, 3, 5 and 7 are closed with blind flanges. Ports 2, 4 and 6 are active and provide sufficient jet velocity and dispersion of the effluent.

The Town of Essex proposes to expand the plant capacity from 1,816 m^3/day (21 L/s) to a 20-year design flow of 3,600 m^3/day (42 L/s) to serve the existing needs and future population growth of the Colchester South Community.

The objectives of the assimilative capacity study are to:

- Characterize the receiving water quantity and quality;
- Build a 3D near-field dilution and mixing model for Lake Erie at the outfall;
- Conduct dilution mixing modeling and mixing zone analysis;
- Assess the potential impact of the discharge on Lake Erie; and
- Make recommendations on effluent limits.

The near-field modelling and effluent dispersion analysis of the treated wastewater from the sewage works were undertaken under conservative effluent and ambient conditions. The scale of the near-field modelling is on the order of several metres to a few hundred metres, which allows a detailed prediction of the effluent plume discharging from the diffuser.

Available water quality data for Lake Erie were used to characterize background water quality of the lake where the plant outfall is located.

The water quality parameters of concern for a municipal sewage plant include CBOD5, TSS, TP, total ammonia (as N), E. coli and pH.

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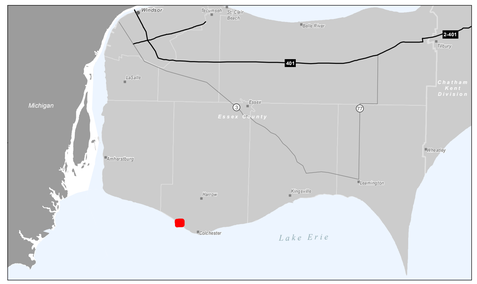
- Sanitary Sewers
- Forcemain
- Sanitary Pump Stations
- Wastewater Treatment Lagoons

0 90 180 metres

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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Orthoimagery © First Base Solutions, 2018, Imagery Date, 2019.
4. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018. Elevations from SWOOP 2015 Digital Elevation Model.



Project Location
Colchester South

165620266 REVA
Prepared by HR on 2023-01-05

Client/Project
Colchester South Sewage Works Expansion

Figure No.
1.0

Title
Colchester South Sewage Works Outfall Location

C:\Users\hindlisbocher\OneDrive - Stantec\Desktop\Colchester\GIS Files\165620266_Colchester Study Area.mxd Revised: 2023-01-05 By: hindlisbocher

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2.0 BACKGROUND

2.1 EXISTING TREATMENT AND COMPLIANCE REQUIREMENTS

The Colchester South Sewage Works operates under the Amended ECA #9096-7SFHHG dated May 28, 2009.). A copy of which is presented in **Appendix A**. The current ECA outlines the effluent compliance limits and objectives for the facility, which are summarized in **Table 2.1** .

Table 2.1. Effluent Objectives and Compliance Limits

	Effluent Limits	Effluent Objectives
Parameter	**Monthly Average Concentration**	**Concentration**
$CBOD_5$	25 mg/L	20 mg/L
TSS	30 mg/L	25 mg/L
Total Phosphorus	1.0 mg/L	0.8 mg/L

2.2 REGULATORY FRAMEWORK

2.2.1 Provincial Water Quality Objectives

Long-term goals for water quality in Ontario are based on Ontario Provincial Water Quality Objectives (PWQO) provided in the MECP publication Water Management – Goals, Policies, Objectives, and Implementation Procedures of Ministry of the Environment (MOE 1994b). Procedures used by the MECP to establish receiving-water based effluent requirements for point source discharges to surface waterbodies are provided in the document Deriving Receiving-Water Based, Point-Source Effluent Requirements for Ontario Waters (MOE 1994a).

PWQO are numerical and narrative criteria which serve as chemical and physical indicators representing a satisfactory level for surface waters. The PWQO are set at a level of water quality which is protective of all forms of aquatic life and all aspects of the aquatic life cycles during indefinite exposure to the water (MOE 1994a).

A receiving water-based approach is used to establish site-specific effluent criteria enforced through the Ontario Water Resources Act, Section 53 (Sewage Works) ECA.

The procedures for developing receiver-based effluent criteria through an assimilative capacity assessment are described in MOE Procedure B-1-5 (MOE 1994b). These procedures identify the following critical components for the analysis:

- Receiving water low flow (e.g., for rivers 7Q20 - the minimum 7-day average low flow with a recurrence period of 20 years);
- Receiving water quality background concentrations (e.g., 75th percentile);
- Receiving water Policy Type (e.g., Policy 1 or Policy 2 Receiver);
- Maximum expected effluent discharge rate;
- Maximum expected effluent constituent concentrations; and
- Effluent criteria (flow rates and concentrations) to be developed from the results of a receiving water AC assessment.

Through the results of the AC Study, a mixing zone is defined. The MECP guiding principles for defining mixing zones are the following:

- Size and extent to be kept as small as reasonably and practically possible;
- Mixing zones must not interfere with beneficial uses of the surface water body;
- Mixing zones must not result in toxic conditions; and
- Mixing zone boundary is defined by the downstream point where effluent assimilation returns the receiver's water quality to either background concentrations or the PWQO.

Thus, ECA effluent limits are established based on background conditions (PWQO or background concentrations), receiver assimilative capacity, Policy Type of the receiver, ecological sensitivity and the size and extent of a reasonable receiving water mixing zone.

2.2.2 Canada-Ontario Lake Erie Action Plan

To assist in reducing toxic and nuisance algal blooms in Lake Erie, the Great Lakes Water Quality Agreement (GLWQA, adopted in 2014) proposed a binational (i.e., Canada and the United States) load reduction target of 40% (from 2008 loads) of total phosphorus entering the Western and Central Basin of Lake Erie by 2025, with an "aspirational" interim goal of 20% by 2020 (Canada-Ontario Agreement Partners 2017).

Canada has adopted the Canada-Ontario Action Plan (Action Plan) for Lake Erie in 2018 to meet all of Ontario's binational and domestic commitments related to phosphorus reductions (MECP 2018).

The Action Plan applies to tributaries, point and non-point sources entering Lake Erie. A phosphorus reduction target has been proposed for the Western Basin of Lake Erie where the Colchester South Sewage Works is located.

Ontario also signed the Western Basin of Lake Erie Collaborative Agreement with the U.S. states of Michigan and Ohio on June 13, 2015. The signatories collectively committed to work to achieve, through an adaptive management process, a recommended 40 per cent total load



reduction in the amount of total and dissolved reactive phosphorus entering Lake Erie's western basin by 2025.

Binationally, the western basin of Lake Erie receives on average 61% of the total Lake Erie phosphorus loads (i.e. 5,492 tonnes of total phosphorus annually) with Canada contributing 647 tonnes (12%) and the U.S. contributing 4,407 tonnes (80%) (MECP 2018).

The proposed actions are organized into five categories: Reduce Phosphorus Loadings; Ensure Effective Policies, Programs and Legislation; Improve the Knowledge Base; Educate and Build Awareness; and Strengthen Leadership and Coordination.

Municipal point sources are now well controlled, with all wastewater treatment plants in the Ontario portion of the basin having at least secondary treatment. However, there are still opportunities to optimize the performance of treatment plants, and to reduce the volume and frequency of bypasses and overflows and to reduce loads from urban stormwater.

The key impact on the levels of treatment required for the Colchester South Sewage Works expansion is that point sources (which contribute 10% to 15% of total load to Lake Erie) establish a legal effluent discharge limit of 0.5 mg/L total phosphorus monthly average for all municipal wastewater treatment plants that have an average daily flow of 3.78 ML/d or more. The Action Plan recognizes that these limits can be achieved using new technology retrofits and/or process modifications which can be made to existing secondary sewage treatment plants that can approach or match the effluent phosphorus concentrations attainable through conventional tertiary treatment (i.e., chemically assisted filtration), but at a lower cost.

2.3 STUDY APPROACH

The sewage works treated effluent is not expected to meet the PWQO or existing background conditions at the outfall, therefore assimilative capacity modelling including dilution, assimilation and mixing zone analysis is required.

The standard MECP procedure for continuous point source discharges requires the use of conservative low flow conditions in the receiver (MOE 1994a). For the purpose of this study, the lowest observed water level in Lake Erie was used to derive water depth at the outfall location. Also, conservative low current velocities were applied in the modeling.

The plant effluent flow and quality were estimated based on the existing and future growth, and proposed treatment documented in the EA for the Colchester South Sewage Works expansion.

Using the maximum design effluent flow in combination with conservative hydrodynamic conditions adds substantial conservatism to the assessment and will demonstrate a high level of confidence that the proposed effluent criteria are protective of the environment.



Following the MECP approved procedures (MOE 1994a), the ambient (background) water quality of the receiver was calculated based on a statistical analysis of the 75th percentile of observed water quality concentrations.

A 3D dilution mixing hydrodynamic model CORMIX was used in this ACS.

2.4 COLCHESTER SOUTH SEWAGE WORKS

The Colchester South Sewage Works is located at 125 Cornwall Road, Harrow ON and provides secondary level biological treatment and tertiary treatment to enhance phosphorus and suspended solids removal. Effluent from the existing lagoon is discharged via a 0.56 m diameter outfall pipe to a point approximately 600 meters offshore in Lake Erie. Effluent discharges through 3 active ports in the end section of the outfall to assist in dispersing the effluent. The sewage works effluent flow rates are discussed in **Section 3.4**.

As part of the plant expansion, no modifications to the existing diffuser ports are proposed as operational 3 ports can hydraulically accommodate increased flows from plant expansion.

3.0 MIXING ZONE ANALYSIS

3.1 MODELLING SOFTWARE

The Cornell Mixing Zone Expert System (CORMIX, Version 12.0) was used to analyze and assess near-field mixing (conditions at and near the initial mixing zone). CORMIX is a software system for the analysis, prediction, and design of aqueous toxic or conventional pollutant discharges into diverse water bodies. The major emphasis is on the geometry and dilution characteristics of the initial mixing zone, but the system can also predict the behavior of the discharge plume at larger distances. CORMIX is a three-dimensional (3D) model which can be run in steady-state and tidal ambient conditions.

3.2 RECEIVING ENVIRONMENT HYDRODYNAMICS

The Colchester South Sewage Works outfall is located in Lake Erie about 600 m offshore. The buried outfall pipe has a diameter of 0.56 m. As per the 1988 design drawings the bottom elevation of the Lake at the outfall is 167.4 m Great Lakes Datum (IGLD). 7 ports rise 0.75 m above lake bottom (**Appendix B**). 3 ports are operational and 4 are closed with blind flanges. Each port has an opening diameter of 0.1 m. The lowest instantaneous Lake Erie water level at the outfall location is 172.20; therefore, the minimum water depth is 4.8 m.

The closest water level data are available from the Department of Fisheries and Oceans water level gauge located at Kingsville (Station 12065) 17.2 km east of Colchester Harbour. The mean

average annual water levels at Kingsville over the last 98 years on record is 174.14 m. Therefore, the average water depth at the outfall is 6.7 m.

The minimum water depth at the outfall is 4.8 m. This water depth was conservatively assumed for modeling purposes and used in CORMIX.

Hydrodynamic conditions at the outfall were characterized based on the modeling results presented in Baird (2009) and (2010). Numerical modeling of Lake Erie near Union and Leamington nearshore and offshore was undertaken using Baird's proprietary three-dimensional hydrodynamic model. Calibration and validation of the model was done by comparing the modeled results with measured ADCP current data in Lake Erie in 2008. Current velocities in Lake Erie near Union are presented in **Table 3.2.** Due to wind forces, surface current velocities are substantially higher than velocities at the bottom.

Table 3.1. Current Velocities in Lake Erie near Union Offshore (Baird 2010)

Surface Currents		**Depth - Average Current**	
Measured, m/s	Modelled, m/s	Measured, m/s	Modelled, m/s
0.15 - 0.18	0.11 – 0.2	0.04 - 0.05	0.04 - 0.06

Baird (2009) studied current velocities at different depths in the vicinity of Leamington Harbour. A current velocity profile from the study is presented in **Figure 2**. The currents were extracted at mid-depth from the GLOFS model at a location near Leamington with a bed elevation of approximately -9.4 IGLD 1985. The minimal observed velocities were 0.02 m/s.

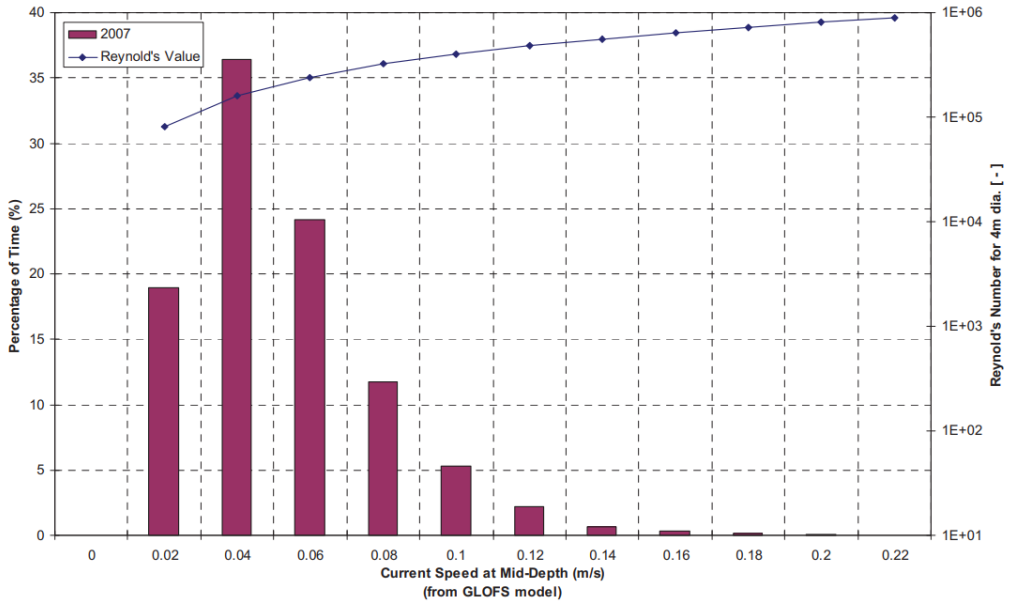


Figure 2. Current Velocity Distribution Data Near Leamington (Baird 2009)

Current velocity at the outfall location is an important input parameter in CORMIX. For the purpose of this assimilative capacity analysis, the minimum measured velocity of 0.02 m/s (Baird 2009 and 2010) was conservatively used in CORMIX.

3.3 BACKGROUND WATER QUALITY

A number of water quality stations are located in western part of Lake Erie (**Figure 3**). Some of these stations have historical water quality data for the parameters of concern (**Table 3.3**). Background water quality data was summarized from the Lake Erie Water Quality Monitoring database (Great Lakes Data Stream 2023) for stations 971, 971A, 1297, 1328, 1461, and 1466.

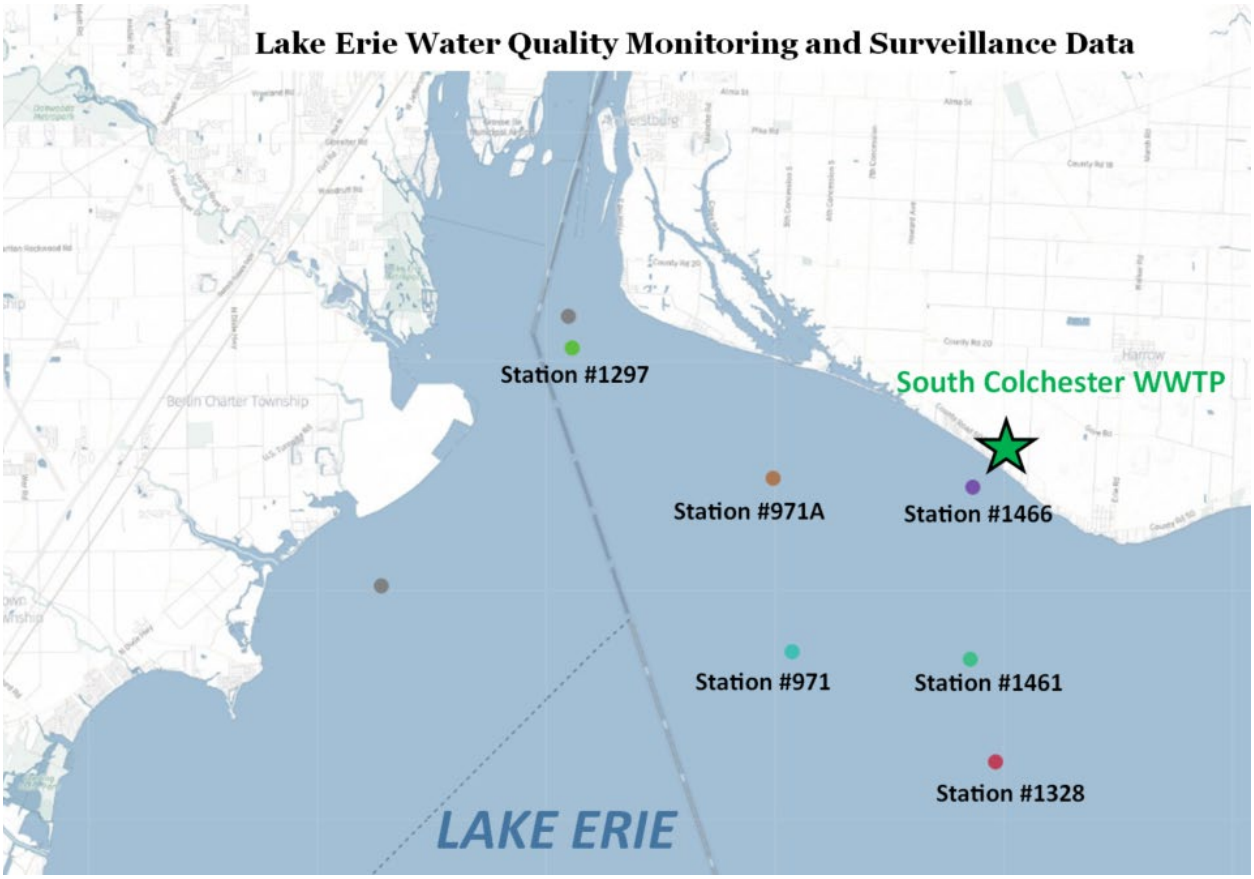


Figure 3. Baseline Water Quality Stations

The average and 75th percentile phosphorus concentration in the receiver is below PWQO (20 ug/L) for lakes. Therefore, Lake Erie is characterized as a Policy 1 receiver for phosphorus.

Table 3.2. Background Water Quality, Lake Erie, 2002-2021

	Number of Samples	Min	Max	Average	75th percentile
Total Ammonia (N), mg/L	10	0.004	0.065	0.016	0.017
pH Field	44	7.67	8.86	8.34	8.55
Phosphorus Total, µg/L	42	5.4	64.2	14.8	15.1
Water Temperature, Feb-Oct, °C	34	5.0	27.1	18.1	23.9
TSS, mg/L	7	2.6	11.2	4.7	4.8

BOD concentrations in Lake Erie are relatively low, based on historical data the average BOD concentrations in the lake are less than 3 mg/L, with an average value of less than 2 mg/L. For modeling purposes, the BOD concentration in the receiver was assumed 2 mg/L.

3.4 MODEL INPUTS

The CORMIX model requires three sets of input parameters to describe: 1) ambient conditions or receiving water body characteristics; 2) effluent discharge characteristics; and 3) diffuser specifications. Receiving water body characteristics were selected based on available literature and results of 3D modeling presented in Baird (2009 and 2010). Effluent discharge characteristics and proposed diffuser design were provided by the Town of Essex.

3.4.1 Receiver characteristic

The required model input for the ambient conditions includes water density, current velocity, and average and outfall water depths. These characteristics affect the near-field transport and shape of the resulting plume of the effluent discharge.

Results of 3D modeling (Baird 2010) indicate that circulation of water in the study area is complex and can be in any direction depending on the wind. Average current velocity measured at surface is 0.15 m/s and depth-average measured velocity is 0.04 m/s (Baird 2010). The minimum observed velocity in the study area is 0.02 m/s (Baird 2009). For the purpose of this assimilative capacity analysis, a measured minimum velocity of 0.02 m/s was conservatively used in CORMIX.

The water column at the outfall was assumed non-stratified as depth is relatively shallow. Ambient water density used in the model was 999.8 kg/m^3, which was calculated based on TDS of 100 mg/L and water temperature of 10° C.

Bottom sediments of Lake Erie at the outfall are grey-green organic sand underlay by mottled grey-red clay (**Appendix B**). For modelling purposes, the Manning's "n", which represents bottom roughness applied to the flow by the channel and dependent on the bottom substrate, was assumed to be 0.03.



Winds can affect the circulation, mixing and plume movement in Lake Erie. The dominant wind direction in the region is from the west (35-50%) and from the south (15-20%). Based on the 1980-2016 hourly data from the Windsor Airport (Station ID 8200774) the mean wind speed is 4.3 m/s.

The first-order decay option can be used in CORMIX, it characterizes exponential removal of a contaminant due to sedimentation, bioaccumulation, or element transformation. However, to provide conservative estimates of water quality in the mixing zone, the decay (or removal) coefficient was not applied in CORMIX for all parameters.

For presentation purposes the initial effluent concentration for an arbitrary parameter prior to discharge was arbitrarily assumed 100 mg/L. Based on this concentration, the dilution factors in the near field mixing zone were derived. Then, the dilution factors were applied to the studied water quality parameters to derive the proposed effluent limit.

3.4.2 Diffuser Configuration

Schematic representation of the diffuser and ports which were modelled using CORMIX are presented in **Appendix B**. The ports extend 0.75 m above the lakebed (i.e., port height). Port spacing is 1.75 m and port diameter is 0.1 m. It is our understanding that out of 7 ports 3 ports are active and 4 are closed with blind flanges.

The number of ports on the diffuser and port diameter are important characteristics as they determine the flow rate from each port and ultimately the resulting plume dilution. Generally, more ports provide better dilution and mixing with the ambient environment. However, a very large number of ports may be expensive to build and maintain, and a larger number of ports may create an undesirable diffuser footprint in the receiving environment as well as not bringing any measurable benefits to the receiving water quality. A 3-port diffuser was used in CORMIX modeling, jet velocity was 1.8 m/s which is within the acceptable range.

The discharge angle theta is the vertical angle of the discharge port relative to the lakebed. An angle of 90° indicates an upward vertical discharge, an angle 0° indicates a horizontal discharge. The latter configuration was used in CORMIX.

Port spacing is an important consideration for multi-port diffuser modelling. Generally, the bigger spacing the better dilution and the smaller the mixing zone. Actual spacing of 1.75 m between the ports was used. **Table 3.5.** summarizes the CORMIX model input data for outfall location.

Table 3.3 CORMIX Input Data

Characteristics	Value
Port Diameter, m	0.1

Table 3.3 CORMIX Input Data

Characteristics	Value
Number of Ports [1]	3
Port Spacing, m	1.75
Vertical Pipe Angle (theta)[2], degree	0
Alignment Angle (gamma)[3], degree	90
Port Height Above Lakebed, m	0.75
Wastewater Flow Rate, L/s	42
Water Depth at Outfall, m	4.8
Average Depth in Mixing Zone, m	4.8
Ambient Velocity, m/s	0.02
Manning's n	0.03
Ambient Water Density, kg/m^3	999.8
Effluent Density, kg/m^3	999.8
Average Wind Speed, m/s	4.3

Notes:
[1] Ports have same orientation
[2] Vertical Pipe Angle (Theta) – angle between port centerline and a horizontal plain
[3] Alignment Angle (Gamma) – angle measured counterclockwise from the ambient flow direction to the diffuser axis.

4.0 RESULTS AND DISCUSSIONS

The objective of near-field modelling is to undertake effluent dispersion analysis of the treated wastewater from the sewage works under conservative effluent and ambient conditions. The scale of the near-field modelling is on the order of several metres to a few hundred metres, which allows for a detailed prediction of the effluent plume discharging from the diffuser.

The near-field modelling was performed to determine the acceptability of expected maximum effluent water quality for a number of parameters. The acceptability was defined as compliance with applicable provincial water quality guidelines at the end of the mixing zone in the receiving environment.

4.1 EFFLUENT DILUTION RATIOS

The results of CORMIX modeling for the 3-port diffuser and the maximum effluent flow rate of 42 L/s are presented in **Table 4.1**.

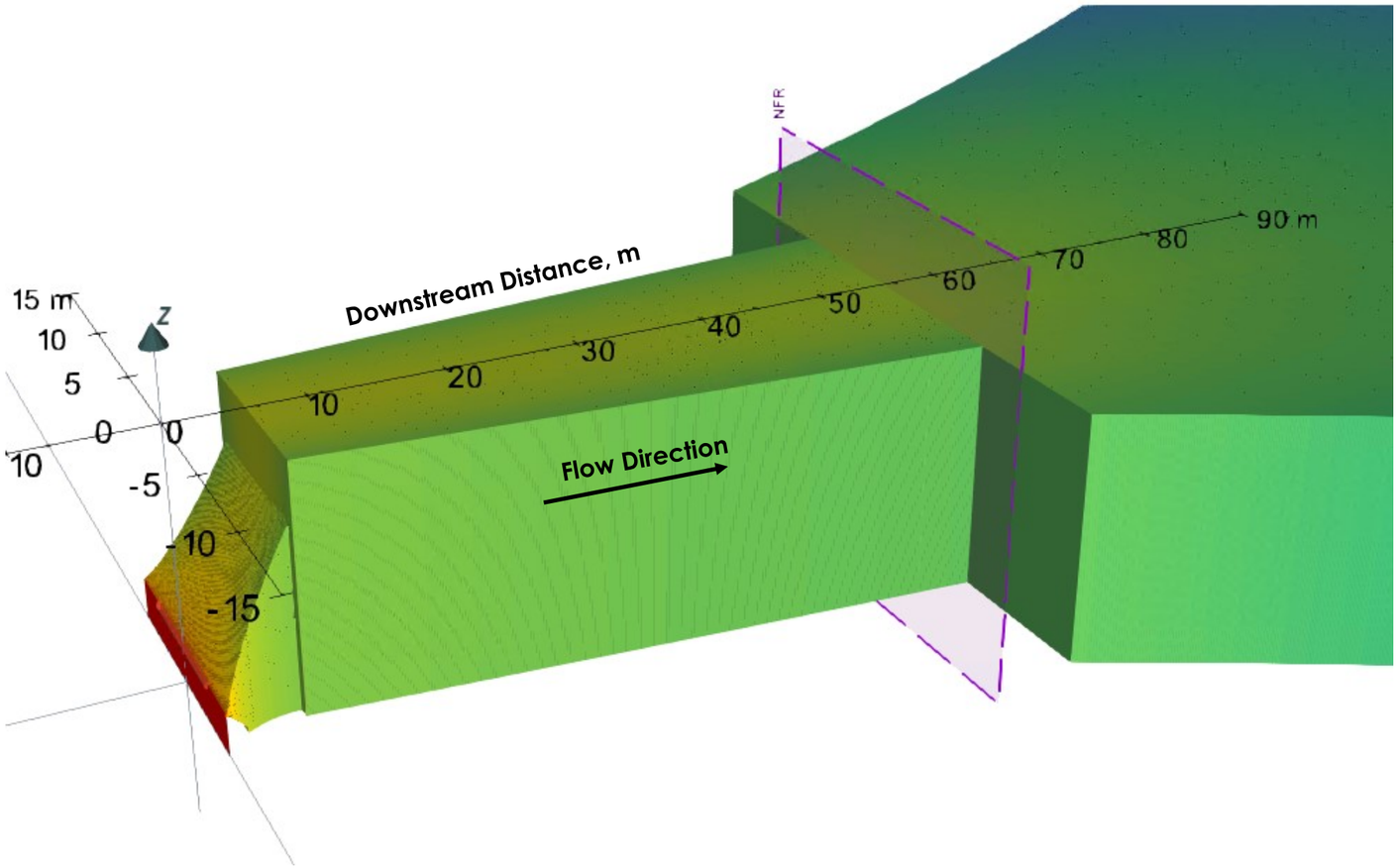
Table 4.1. Effluent Dilution Ratios

Scenario	Distance from Diffuser and Dilution Ratio							
	1 m	2 m	5 m	10 m	25 m	50 m	75 m	100 m
Effluent Flow, 42 L/s	21.5	30.0	46.9	52.8	58.1	66.0	94.3	133.5

The plume from the 3 ports diffuser with an effluent flow of 42 L/s reaches the surface at about 6 m from the diffuser. Jet velocity is 1.8 m/s. The dilution ratio is 30 times at 2 m from the diffuser and 133 times at 100 m from the diffuser. **Figure 4** presents the side view of the plume.

Due to configuration of the ports and a 0.75 m port height, the plume interacts with the lakebed after about 3 m where the effluent concentration reduces substantially, and therefore not likely to result in potential adverse effects on the benthic environment.

Figure 4. CORMIX RESULTS



Effluent Concentration (mg/L)

0.1 0.2 0.4 0.8 1.6 3.2 6.3 12.6 25.1 50.1 100.0

4.2 WATER QUALITY MODELING RESULTS

Water quality parameters of concern in the treated effluent are CBOD, TSS, TP, total ammonia, E. coli and pH. Water temperature is not considered a parameter of concern however, as requested by the MECP the thermal plume assessment was also conducted.

4.2.1 CBOD

CBOD refers to the amount of oxygen that would be consumed if all organic material in one liter of a sample were oxidized. CBOD directly affects the amount of dissolved oxygen in the mixing zone. Because organic matter needs varying time spans to be oxidized, a standard procedure is to use a 5-day incubation at 20 ºC which is referred to as $CBOD_5$. There are no CCME or provincial guidelines for BOD. McNeeley et al. (1979) consider waters with $CBOD_5$ less than 4 mg/L to be reasonably clean.

BOD concentration in the receiver is 2.0 mg/L. Proposed maximum $CBOD_5$ concentration in the effluent is 15 mg/L. Conservatively assuming no decay, sedimentation, or any other form of transformation of organic matter, the modeling result shows that $CBOD_5$ concentration will reduce to baseline values within 5 m from the diffuser. Therefore, effects of BOD on water environment and dissolved oxygen concentrations in the mixing zone is very small.

4.2.2 TSS

Total suspended solids (TSS) consist of silt, clay, fine particles of organic and inorganic matter, plankton, and other microscopic organisms. In near shore waters a substantial proportion of suspended particles come from the resuspension of fine, unconsolidated sediments and detritus by wave action and currents.

The PWQOs do not contain references to TSS criteria. A TSS monthly average effluent limit of 15 mg/L is proposed at the point of discharge. This is expected to be achievable based on treatment technology of the proposed plant. The proposed effluent objective for TSS is 10 mg/L.

4.2.3 Total Phosphorus

Total phosphorus (TP) is a measure of both inorganic and organic forms of phosphorus. Both forms are essential nutrients for plant growth, however high concentrations of total phosphorus may result in excessive algal growth followed by their settling and decay in sediments.

The PWQO for TP for lakes is 0.02 mg/L and it is intended to prevent the nuisance growth of algae in the lakes. TP is not toxic to aquatic life, but excess concentrations can lead to undesirable changes in aquatic ecosystems (e.g., reduced biodiversity, reduced oxygen conditions, toxic algae blooms, impaired aesthetics and recreational opportunities).

Ambient concentrations of TP in Lake Erie vary between 0.005 g/L to 0.064 mg/L. The 75th percentile of background TP concentration in Lake Erie is 0.015 mg/L (**Table 3.3**). Therefore, Lake Erie is a Policy 1 receiver for phosphorus.

As per the Lake Erie Action Plan for phosphorus reduction, the total phosphorus in a treated effluent of a larger-sized sewage plant should be limited 0.5 mg/L. Therefore, proposed maximum TP concentration in the effluent is 0.5 mg/L. This concentration is a 50% reduction from the existing TP effluent limit of 1 mg/L. The ultimate TP load after plant expansion is proposed to be the same as in the current conditions.

A dilution ratio of 95 times is required to reduce the effluent concentration to the PWQO level (0.02 mg/L). This dilution ratio is achieved in about 75 m from the diffuser.

4.2.4 Ammonia

Total ammonia is the sum of un-ionized ammonia (NH_3) and ionized ammonia (NH_4). Typically, an equilibrium exists between NH_3 and NH_4, which is governed mostly by pH and water temperature. In assimilative capacity studies, un-ionized ammonia is of primary interest as it can be toxic in small concentrations. Raising the pH by one unit can cause the un-ionized ammonia concentration to increase nearly ten-fold, while a 5ºC temperature increase can cause an increase in un-ionized ammonia of 40-50% (Environment Canada 1999). Other factors which could indirectly affect un-ionized ammonia include water hydraulics (velocities, cross-sections), meteorological conditions and alkalinity.

In summer, the 75th percentile of water temperature in the lake is 23.9 ºC and pH is 8.55. In wintertime, water temperature in the lake is 5 ºC and pH is 8.3. The ambient 75th percentile concentration of total ammonia is 0.017 mg/L (**Table 3.3**).

Un-ionized ammonia in the receiver was calculated based on modelled dilution ratios (**Table 4.1**) and baseline water quality.

Proposed total ammonia effluent limit for summer conditions is 1.5 mg/L. In the worst-case summer scenario, this total ammonia concentration corresponds to 0.24 mg/L of un-ionized ammonia in the treated effluent. In summertime, un-ionized ammonia will drop from 0.24 mg/L to the PWQO of 0.02 mg/L (as N) within 1 m from the diffuser.

Proposed total ammonia effluent limit for winter conditions is 3.0 mg/L. In the worst-case winter scenario, this total ammonia concentration corresponds to 0.07 mg/L of un-ionized ammonia in the treated effluent. In wintertime, un-ionized ammonia will drop from 0.07 mg/L to the PWQO of 0.02 mg/L (as N) within 1 m from the diffuser.

As previously discussed, it is a very conservative estimation as it uses maximum effluent flow, maximum ammonia concentration, worst-case ambient conditions and ignores nitrification, and other in-lake processes (e.g. bioaccumulation, sedimentation, decay).

4.2.5 E. coli

E. coli refers to a large group of bacteria that are commonly found in the intestines of mammals. Proposed effluent concentration for E. coli is 200 counts /100 mL which is an achievable target for the sanitary treatment plant. Background concentration of E. coli in Lake Erie is non-detectable in most cases.

The PWQO limit for E. coli is 100 counts/100 mL. A dilution ratio of 2 times is required to reduce the effluent concentration to the PWQO limit. The results from CORMIX show that the PWQO limit for E. coli is achieved within the immediate vicinity (<1 m) of the treated effluent discharge location.

4.2.6 pH

The PWQO range for pH to protect aquatic life should be maintained from 6.5 to 8.5. Background pH concentrations in the lake vary from 7.67 to 8.86 with the average value of 8.13.

The effluent criteria for pH were selected as the PWQO range.

4.2.7 Water Temperature

The PWQO for effluent temperature indicates the following (MOEE 1994):

- The temperature at the edge of a mixing zone shall not exceed the natural ambient water temperature at a representative control location by more than 10°C, and
- The maximum temperature of the receiving body of water, at any point in the thermal plume outside a mixing zone, shall not exceed 30°C or the temperature of a representative control location plus 10°C or the allowed temperature difference, whichever is the lesser temperature. These maximum temperatures are to be measured on a mean daily basis from continuous records.

A highly conservative scenario with a temperature differential of 20 °C between ambient temperature and effluent temperature was run using a CORMIX model. The CORMIX results indicated that Lake Erie has very high dilution and mixing potential that results in a very small thermal mixing zone. A 20°C differential between the effluent and ambient conditions drops to a 0.5°C differential within 1 m from the diffuser. No thermal effects are observed beyond 2 m for the diffuser. The size of the thermal mixing zone is very small and can be considered instantaneous mixing.

Based on modeling results it was concluded that differential between ambient and effluent temperature up to 20°C does not impact the thermal regime of Lake Erie and meets PWQO thermal mixing zone requirements within 1 m.

4.3 PROPOSED EFFLUENT LIMITS

Based on the modelling results and discussion in Sections 4.1 to 4.2, the proposed plant monthly average effluent criteria were developed (**Table 4.2**). The proposed effluent criteria are intended to meet the PWQO concentrations or background conditions within either the immediate vicinity of the diffuser or within a reasonable mixing zone. They are believed to be achievable for the proposed plant expansion.

Table 4.2. Proposed Effluent Limits

Parameter	Effluent Limits	Effluent Objectives
$CBOD_5$	15 mg/L	10 mg/L
TSS	15 mg/L	10 mg/L
Total Phosphorus	0.5 mg/L	0.4 mg/L
Total Ammonia (Nitrogen):		
Summer (May 1 to October 31)	1.5 mg/L	1 mg/L
Winter (Nov 1 to April 30)	3 mg/L	2 mg/L
E. coli (monthly geometric mean)	200 CFU/100 mL or 200 MPN / 100 mL	100 CFU/100 mL or 100 MPN / 100 mL
pH (grab sample)	6.5 - 8.5	6.5 - 8.5

5.0 CONCLUSION

Effluent dispersion analysis of the treated wastewater under conservative ambient conditions was undertaken using a 3D near-field hydrodynamic model.

Effluent dilution ratios for the 3-port diffuser are presented in **Table 4.1. Figure 4** presents the side view of the discharged plume for the maximum flow of 42 L/s.

The plume from the diffuser reaches the surface water at about 8 m from the diffuser. The dilution ratio is 30 times at 2 m from the diffuser and 133 times at 100 m from the diffuser. Due to configuration of the ports, the plume interacts with the lakebed after about 3 m where the effluent concentration reduces substantially, and therefore not likely to result in potential adverse effects on the benthic environment.

The proposed maximum effluent limits are presented in **Table 4.2.** They are derived based on the conservative modelling conditions (e.g., low lake levels, low velocities in the receiver, high effluent rate, and ignoring decay, sedimentation and bioaccumulation).

6.0 REFERENCES

Baird and Associates Coastal Engineers. 2009. Colchester to Southeast Shoal Beach Nourishment Study, Report prepared for the Essex Region Conservation Authority, May 18, 2009

Baird and Associates Coastal Engineers. 2010. In-water IPZ-2 Delineation for Essex Region and Chatham-Kent Intakes - Phase II Studies, January 2010.

Great Lakes Data Stream. 2023. Lake Erie Water Quality Monitoring and Surveillance Data. Assessed on March 3, 2023. https://greatlakesdatastream.ca/en/about

Environment Canada (EC). 1999. *Canadian Environmental Protection Act* Priority Substances List II – Supporting Document for Ammonia in the Aquatic Environment.

McNeely, R.N., Neimanis, V.P. and L. Dwyer. 1979. Dissolved Oxygen. In: Water Quality Sourcebook. A Guide to Water Quality Parameters. Water Quality Branch, Inland Waters Directorate, Environment Canada, Ottawa, Ont. pp. 33-34.

MOE. 1994a. Deriving Receiving-Water Based, Point-Source Effluent Requirements For Ontario Waters. Ministry of Environment and Energy, July, 1994.

MOE. 1994b. Water Management – Goals, Policies, Objectives and Implementation Procedures of Ministry of the Environment. Ministry of Environment and Energy, July, 1994.

Appendix A ENVIRONMENTAL COMPLIANCE APPROVAL

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Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED CERTIFICATE OF APPROVAL
MUNICIPAL AND PRIVATE SEWAGE WORKS
NUMBER 9096-7SFHHG
Issue Date: May 28, 2009

The Corporation of the Town of Essex
33 Talbot St S
Essex, Ontario
N8M 1A8

Site Location: Colchester South Lagoon
Lot 82, Concession 1
Essex, County of Essex

You have applied in accordance with Section 53 of the Ontario Water Resources Act for approval of:

Alterations to the existing municipal sewage works for the collection, transmission, treatment and disposal of sewage, having a *Rated Capacity* of 1,816 m^3/d and consisting of the following:

PROPOSED WORKS

Sewage Treatment Facilities

- Pilot Project - Experimental Operating Procedure for the period from April 1 to October 31 only, during which the effluent from the primary cell may be discharged directly to the tertiary cell, bypassing the secondary cell;
- Provisions for the use of alum and other appropriate alternate polymerised alums, polyaluminum chloride or iron chlorides and additional/alternate continuous or batch dosing in the primary, secondary cell or tertiary cell to enhance phosphorus and suspended solids removal;

EXISTING WORKS

Sanitary Sewers

- sanitary sewers and appurtenances, including stub sewer connections and building sewers from the main sewer to the street line on Maple Boulevard, Lane approx. 530 m south of County Road No. 50, Easement approx. 380 m south of County Road No. 50, McCarthy Beach Road (private Right-of-Way), Lane approx. 535 m south of County Road No. 50, Easement approx. 460 m south of County Road No. 50, Nottingham Drive, Lincoln Court, Fox Place, Washington Court, Bellcroft Drive, Right-of-Way approx. 100 m south of Fox Place, Ambassador Drive (private drive), Private road approx. 40 m south of Lakeview Avenue, Beverly Boulevard, Santa Ana Avenue, Lakeview Avenue, Sunset Avenue, Santa Monica Blvd., Wilshire Place, Circle V-1 Road (private road), Pleasure Beach Road (private road), Circle V-2 Road (private road), Pigeon Beach Road (private Right-of-Way), Easement just north of Lakeview Avenue, Lakeview Avenue (including the easement extending to the east and the east extension of Cumberland Way), Allison Avenue, Maple Avenue, Windsor Avenue, Cumberland Way (including west extension), Gloucester Drive (Argyle Beach Road), Private Right-of-Way approx. 500 m south of County Road No. 50 (Lots 82 to 86, Conc. 1), Private Right-of-Way approx. 500 m south of County Road No. 50 (Lots 81 & 82, Conc. 1), Wright Road, Easement approx. 600 m south of County Road No. 50 (Lots 77 to 79, Conc. 1), Easement approx. 600 m south of County Road No. 50 (Lots 79 & 80, Conc. 1), Easement approx. 260 m west of Marsden Ave., County Road No. 50, Marsden Avenue, Shawondasee Boulevard, Wabasso Road, Right-of-Way approx. 45 m east of Wabasso Rd., Kayoshk Road, Wawa Crescent, Easement in Tawasentha Park, Dahinda Drive, Easement approx. 55 m west of McClain Boulevard, Victoria Avenue, McClain Boulevard, Chester Road, Private Right-of-Way approx. 185 m east of Westchester Road, Easement approx. 25 m south of Chester Road, Westchester Road, Walnut Lane (private Right-of-Way), Adelaide Street, Prado Avenue, Herring Avenue, Ferris Avenue, Erie Street, Lake Street, Levergood Drive, Dunn Street, Murdock Street, Sullivan Street, Harrison Street, Draper Street, Easement West side of

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Jackson Street between Jackson Street and Sullivan Street, Ogden Street, Jackson Street, Sydenham Street, Bagot Street, Clitherow Street, Daley Street;

Sewage Pumping Stations

- pumping station No. 5, located on the private Right-of-Way approx. 185 m east of Westchester Road at the intersection with Chester Road, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 42.4 litres per second at a TDH of 6.13 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations, an inlet sewer from, and an outlet sewer to, the sewer located on the private Right-of-Way approx. 185 m east of Westchester Road;

- pumping station No. 6, located at the intersection between Shawondasee Boulevard and Wabasso Road, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 48.7 litres per second at a TDH of 7.92 metres, including sonic level sensor automatic dual-pump control, and float switch alarm installations, an inlet sewer from the sewer located on Shawondasee Boulevard and an outlet sewer to the sewer located on Wabasso Rd.;

- pumping station No. 7, located on the easement approx. 600 m south of County Road No. 50, approx. 50 m west of Marsden Avenue, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 52.7 litres per second of a TDH of 6.49 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations inlet sewer from, and outlet sewer to, the sewer located on the easement approx. 600 m south of County Road No.50;

- pumping station No. 2, located on the west extension of Cumberland Way, approx. 25 m west of Gloucester Drive, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 34.5 litres per second at a TDH of 9.88 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations, inlet sewer from, and outlet sewer to, the sewer located on the west extension of Cumberland Way;

- pumping station No. 3, located on Erie Street near Maple Boulevard (Lot 20, RP 1466), consisting of a 3,050 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 6.5 litres per second at a TDH of 6.0 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations, inlet sewer from Erie Street and outlet sewer to Maple Boulevard;

Sewage Treatment Facilities

aerated facultative sewage lagoon located on Lot 82, concession 1, to the north of the private Right-of-Way approx. 500 m south of County Road No. 50 and to the west of Cornwall Beach Road, having a *Rated Capacity* of 1,816 m^3/d and consisting of:

- pumping station No. 1, consisting of a 3,660 millimetre diameter precast concrete wet well, equipped with two (2) submersible sewage pumps, each rated at 94.2 litres per second at a TDH of 15.06 metres, including sonic level sensor automatic dual-pump control and float switch alarm installations, inlet sewer from the sewer located on the private Right-of-Way south of the sewage treatment facilities, valve chamber discharge pipes from the pumps to the valve chamber, and forcemain from the valve chamber to the lagoon inlet distribution chamber;

- three (3) sequentially operated cells having effective capacities of 23,385 cubic metres (primary cell), 13,974 cubic metres (secondary cell) and 6,254 cubic metres (tertiary cell), total depth of 5.0 metres (i.e., 1.0 m freeboard, 0.3 m ice cover allowance, 3.4 m effective depth, 0.3 m sludge storage), width of all berms at the top of 3.0 metres, outer and inner berm slopes of 3:1 (all inner slopes protected against erosion by a layer of crushed limestone placed over filter fabric), blanket drain (polyethylene mesh structure with geotextile on both sides) placed under the top layer of clay lining the cells throughout the bottoms and inner slopes of the cells, including blanket drain collector pipes discharging into the inlet sewer ahead of pumping station No. 1;

- lagoon aeration system consisting of propeller aspirator type aerators mounted on two-pontoon floating assemblies anchored with a cable system to the anchor posts on the cell berms, with four (4) 7½ HP aerators fitted with "7½ HP" propellers in the primary cell, two (2) 7½ HP aerators fitted with "5 HP" propellers in the secondary cell and one (1) 7½

HP aerator fitted with "5 HP" propeller in the tertiary cell;

- inflow distribution and flow control system, including: inlet distribution chamber, two (2) flow control chambers, outfall chamber, cell inflow and outflow pipes, and collection and by-pass sewers;

- control building housing phosphorus removal facility, stand-by diesel generator, laboratory and storage;

- phosphorus removal facility, located in the control building, consisting of a 22.7 cubic metre capacity chemical storage tank, two (2) diaphragm type metering pumps (one installed, one spare) rated at 5 to 50 millilitres per second, and a chemical feed line to pumping station No. 1 with two alternate points of chemical feed in the wet well and in the valve chamber (pressure feed into the forcemain);

- outfall sewer from the lagoon system's outfall chamber to Lake Erie approx. 600 metres off-shore, including valve chamber located within the treatment facility's property and a multi-port diffuser;

Miscellaneous

- all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works;

all in accordance with the following submitted supporting documents:

1. applications dated July 24, 1985 (preliminary), February 15, 1988 (Contract 3), February 24 (Contracts 5 and 6), March 7, 1988 (Contract 1), and March 31, 1988 (Contract 2), and all associated plans and specifications prepared and submitted by LaFontaine, Cowie, Buratto & Associates Limited;
2. Application for Approval of Municipal and Private Sewage Works submitted by Dino Buratto of Stantec Consulting Ltd. received March 4, 2008 for the Pilot Project - Experimental Operating Procedures and subsequent email correspondence dated March 25, 2008 and March 28, 2008;
3. Application for Approval of Municipal and Private Sewage Works submitted by Dino Buratto of Stantec Consulting Ltd. received June 25, 2008 for the alternate chemical and alternate dosing methods for phosphorus removal;
4. Application for Approval of Municipal and Private Sewage Works submitted by Dino Buratto of Stantec Consulting Ltd. dated April 9, 2009.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

"*Act*" means the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended;

""*Average Daily Flow*" means the cumulative total sewage flow to the sewage works during a calendar year divided by the number of days during which sewage was flowing to the sewage works that year;

"*BOD5*" (also known as TBOD5) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demand;

"*By-pass"* means any discharge from the *Works* that does not undergo any treatment or only receives partial treatment before it is discharged to the environment;

"*CBOD5*" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;

"*Certificate*" means this entire certificate of approval document, issued in accordance with Section 53 of the *Act*, and includes any schedules;

"*Daily Concentration*" means the concentration of a contaminant in the effluent discharged over any single day, as measured by a composite or grab sample, whichever is required;

"*Director*" means any *Ministry* employee appointed by the Minister pursuant to section 5 of the *Act*;

"*District Manager*" means the District Manager of the Windsor District Office of the Ministry;

"Existing Works" means those portions of the sewage works previously constructed and existing on-site on the date of issuance of this *Certificate*;

"*Ministry*" means the Ontario Ministry of the Environment;

"*Monthly Average Concentration*" means the arithmetic mean of all *Daily Concentrations* of a contaminant in the effluent sampled or measured, or both, during a calendar month;

"*Monthly Average Daily Flow*" means the cumulative total sewage flow to the sewage works during a calendar month divided by the number of days during which sewage was flowing to the sewage works that month;

"*Owner*" means The Corporation of the Town of Essex and includes its successors and assignees;

"Proposed Works" means the sewage works described in the *Owner*'s application, this *Certificate* and in the supporting documentation referred to herein, to the extent approved by this *Certificate*;

"*Rated Capacity*" means the *Average Daily Flow* for which the *Works* are approved to handle;

"*Regional Director*" means the Regional Director of the Southwestern Region of the Ministry; and

"*Works*" means the sewage works described in the *Owner*'s application, this *Certificate* and in the supporting documentation referred to herein, to the extent approved by this *Certificate* and includes both *Existing Works* and *Proposed Works*.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

(1) The *Owner* shall ensure that any person authorized to carry out work on or operate any aspect of the *Works* is notified of this *Certificate* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Except as otherwise provided by these Conditions, the *Owner* shall design, build, install, operate and maintain the *Works* in accordance with the description given in this *Certificate*, the application for approval of the works and the submitted supporting documents and plans and specifications as listed in this *Certificate*.

(3) Where there is a conflict between a provision of any submitted document referred to in this *Certificate* and the Conditions of this *Certificate*, the Conditions in this *Certificate* shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

(4) Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(5) The requirements of this *Certificate* are severable. If any requirement of this *Certificate*, or the application of any requirement of this *Certificate* to any circumstance, is held invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this certificate shall not be affected thereby.

(6) The approval granted by this *Certificate* is based upon a review of the *Works* in the context of its effect on the environment, its process performance and general principles of wastewater engineering. The review did not include a consideration of the architectural, mechanical, electrical or structural components and minor details of the *Works* except to the extent necessary to review the *Works*.

2. EXPIRY OF APPROVAL

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The approval for the Pilot Project - Experimental Operating Procedure issued by this *Certificate* will cease to apply to when the recorded *Monthly Average Daily Flow* to the sewage treatment facilities exceed 1,200 m^3/d.

3. CHANGE OF OWNER

(1) The *Owner* shall notify the *District Manager* and the *Director*, in writing, of any of the following changes within 30 days of the change occurring:

(a) change of *Owner*;

(b) change of address of the *Owner*;

(c) change of partners where the *Owner* is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c.B17 shall be included in the notification to the *District Manager*;

(d) change of name of the corporation where the *Owner* is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C39 shall be included in the notification to the *District Manager*;

(2) In the event of any change in ownership of the *Works*, other than a change to a successor municipality, the *Owner* shall notify in writing the succeeding owner of the existence of this *Certificate*, and a copy of such notice shall be forwarded to the *District Manager* and the *Director*.

4. RECORD DRAWINGS

(1) A set of as-built drawings showing the works "as constructed" shall be kept up to date through revisions undertaken from time to time and a copy shall be retained at the *Works* for the operational life of the *Works*.

5. BY-PASSES

(1) Any *By-pass* of sewage from any portion of the *Works* is prohibited, except where:

(a) it is permitted under the Pilot Project - Experimental Operating Procedure for the period from April 1 to October 31 only, during which the effluent from the primary cell may be discharged directly to the tertiary cell, bypassing the secondary cell;

(b) it is necessary to avoid loss of life, personal injury, danger to public health or severe property damage;

(c) the *District Manager* agrees that it is necessary for the purpose of carrying out essential maintenance and the *District Manager* has given prior written acknowledgment of the *by-pass*; or

(d) the *Regional Director* has given prior written acknowledgment of the *By-pass*.

(2) The *Owner* shall collect at least one (1) grab sample of the *By-pass* and have it analyzed for the parameters outlined in Condition 7 using the protocols in Condition 9.

(3) The *Owner* shall maintain a logbook of all *By-pass* events which shall include, at a minimum, the time, location, duration, quantity of *By-pass*, the authority for *By-pass* pursuant to subsection (1), and the reasons for the occurrence.

6. EFFLUENT OBJECTIVES

(1) The *Owner* shall use best efforts to design and operate the *Works* with the objective that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the *Works*.

Table 1 - Effluent Objectives	
Effluent Parameter	**Concentration Objective** (milligrams per litre unless otherwise indicated)
CBOD5	20.0
Total Suspended Solids	25.0
Total Phosphorus	0.8

(2) The *Owner* shall use best efforts to:

(a) maintain the pH of the effluent from the *Works* within the range of 6.5 - 9.0, inclusive, at all times;

(b) operate the works within the *Rated Capacity* of the *Works*;

(c) ensure that the effluent from the *Works* is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film or sheen or foam or discolouration on the receiving waters.

(3) The *Owner* shall include in all reports submitted in accordance with Condition 10 a summary of the efforts made and results achieved under this Condition.

7. EFFLUENT LIMITS

(1) The *Owner* shall design and operate and maintain the *Works* such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the *Works*.

Table 2 - Effluent Limits	
Effluent Parameter	**Average Concentration** (milligrams per litre unless otherwise indicated)
CBOD5	25.0
Total Suspended Solids	30.0
Total Phosphorus	1.0

(2) For the purposes of determining compliance with and enforcing subsection (1):

(a) The *Monthly Average Concentration* of a parameter named in Column 1 of subsection (1) shall not exceed the corresponding maximum concentration set out in Column 2 of subsection (1).

(3) Subsection (2) shall apply upon the issuance of this *Certificate.*

8. OPERATION AND MAINTENANCE

(1) The *Owner* shall exercise due diligence in ensuring that, at all times, the *Works* and the related equipment and appurtenances used to achieve compliance with this *Certificate* are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate operator staffing and training, including training in all procedures and other requirements of this *Certificate* and the *Act* and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the *Works*.

(2) The *Owner* shall prepare an operations manual, that includes, but not necessarily limited to, the following information:

(a) operating procedures for routine operation of the *Works*;

(b) inspection programs, including frequency of inspection, for the *Works* and the methods or tests employed

to detect when maintenance is necessary;

(c) repair and maintenance programs, including the frequency of repair and maintenance for the *Works*;

(d) procedures for the inspection and calibration of monitoring equipment;

(e) a spill prevention control and countermeasures plan, consisting of contingency plans and procedures for dealing with equipment breakdowns, potential spills and any other abnormal situations, including notification of the *District Manager*; and

(f) procedures for receiving, responding and recording public complaints, including recording any followup actions taken.

(3) The *Owner* shall maintain the operations manual current and retain a copy at the location of the *Works* for the operational life of the *Works*. Upon request, the *Owner* shall make the manual available to *Ministry* staff.

(4) The *Owner* shall provide for the overall operation of the *Works* with an operator who holds a licence that is applicable to that type of facility and that is of the same class as or higher than the class of the facility in accordance with Ontario Regulation 129/04.

9. MONITORING AND RECORDING

The *Owner* shall, upon commencement of operation of the *Works*, carry out the following monitoring program:

(1) All samples and measurements taken for the purposes of this *Certificate* are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) For the purposes of this condition, the following definitions apply:

(a) Daily means once each day;
(b) 3/Week means three times each week;
(c) Weekly means once each week;
(d) Monthly means once every month;

(3) Samples shall be collected at the following sampling points, at the frequency specified, by means of the specified sample type and analyzed for each parameter listed and all results recorded:

Table 3 - Influent Monitoring	
Frequency	Monthly
Sample Type	Composite
Parameters	*BOD5*, Total Suspended Solids, Total Phosphorus

Table 4 - Effluent Monitoring under normal operating procedure - discharge from tertiary cell		
Parameters	**Sample Type**	**Frequency**
CBOD5	Composite	Weekly
Total Suspended Solids	Composite	Weekly
Total Phosphorus	Composite	Weekly
pH	Grab	Weekly
Temperature	Grab	Weekly
Alkalinity	Grab	Weekly

Table 5 - Effluent Monitoring under experimental operating procedure - discharge from primary cell and tertiary cell		
Parameters	**Sample Type**	**Frequency**
CBOD5	Composite	Weekly
Total Suspended Solids	Composite	3/Week
Total Phosphorus	Composite	Weekly
pH	Grab	Daily
Temperature	Grab	Daily
Alkalinity	Grab	Daily

(4) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's Procedure F-10-1, “Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended from time to time by more recently published editions;

(b) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

(c) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions;

(5) The measurement frequencies specified in subsection (3) in respect to any parameter are minimum requirements which may be modified by the *District Manager* in writing from time to time.

(6) The *Owner* shall install and maintain continuous flow measuring device, to measure the flowrate of the influent to or effluent from the *Works* with an accuracy to within plus or minus 15 per cent (+/- 15%) of the actual flowrate for the entire design range of the flow measuring device, and record the flowrate at a daily frequency.

10. REPORTING

(1) One week prior to the start up of the operation of the Pilot Project - Experimental Operating Procedure, the *Owner* shall notify the *District Manager* (in writing) of the pending start up date.

(2) Ten (10) days prior to the date of a planned *By-pass* being conducted pursuant to Condition 5 and as soon as possible for an unplanned *By-pass*, the *Owner* shall notify the *District Manager* (in writing) of the pending start date, in addition to an assessment of the potential adverse effects on the environment and the duration of the *By-pass*.

(3) The *Owner* shall report to the *District Manager* or designate, any exceedence of any parameter specified in Condition 7 orally, as soon as reasonably possible, and in writing within seven (7) days of the exceedence.

(4) In addition to the obligations under Part X of the Environmental Protection Act, the *Owner* shall, within 10 working days of the occurrence of any reportable spill as defined in Ontario Regulation 675/98, bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the *District Manager* describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

(5) The *Owner* shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to *Ministry* staff.

(6) The *Owner* shall prepare, and submit to the *District Manager,* a performance report, on an annual basis, within ninety (90) days following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the *Works* and subsequent reports shall be submitted to cover successive

annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

(a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 7, including an overview of the success and adequacy of the *Works*;

(b) a description of any operating problems encountered and corrective actions taken;

(c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the *Works*;

(d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;

(e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment; and

(f) a description of efforts made and results achieved in meeting the Effluent Objectives of Condition 6.

(g) a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;

(h) a summary of any complaints received during the reporting period and any steps taken to address the complaints;

(i) a summary of all *By-pass*, spill or abnormal discharge events; and

(j) any other information the *District Manager* requires from time to time.

(7) The *Owner* shall submit to the *Regional* Director and *District Manager* on a weekly basis, all pertinent information and monitoring results when the sewage treatment facilities are operated under Experimental Operating Procedure and within one week of these information becoming available.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the *Works* are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the *Certificate* and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this *Certificate* the existence of this *Certificate*.

2. Condition 2 is included to ensure that the Experimental Operating Procedure is only used during relatively warm seasonal period and under low flow condition.

3. Condition 3 is included to ensure that the *Ministry* records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the *Works* are made aware of the *Certificate* and continue to operate the *Works* in compliance with it.

4. Condition 4 is included to ensure that record drawings of the *Works* “as constructed” are maintained for future references.

5. Condition 5 is included to indicate that by-passes of untreated sewage to the receiving watercourse is prohibited, save in certain limited circumstances where the failure to *By-pass* could result in greater injury to the public interest than the *By-pass* itself where a *By-pass* will not violate the approved effluent requirements, or where the *By-pass* can be limited or otherwise mitigated by handling it in accordance with an approved contingency plan. The notification and documentation requirements allow the *Ministry* to take action in an informed manner and will ensure the *Owner* is aware of the extent and frequency of *By-pass* events.

6. Condition 6 is imposed to establish non-enforceable effluent quality objectives which the *Owner* is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits of Condition 7 are

CONTENT COPY OF ORIGINAL

exceeded.

7. Condition 7 is imposed to ensure that the effluent discharged from the *Works* to Lake Erie meets the *Ministry*'s effluent quality requirements thus minimizing environmental impact on the receiver and to protect water quality, fish and other aquatic life in the receiving water body.

8. Condition 8 is included to require that the *Works* be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the owner and made available to the *Ministry*. Such a manual is an integral part of the operation of the *Works*. Its compilation and use should assist the *Owner* in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for *Ministry* staff when reviewing the *Owner*'s operation of the work.

9. Condition 9 is included to enable the *Owner* to evaluate and demonstrate the performance of the *Works*, on a continual basis, so that the *Works* are properly operated and maintained at a level which is consistent with the design objectives and effluent limits specified in the *Certificate* and that the *Works* does not cause any impairment to the receiving watercourse.

10. Condition 10 is included to provide a performance record for future references, to ensure that the *Ministry* is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this *Certificate,* so that the *Ministry* can work with the *Owner* in resolving any problems in a timely manner.

This Certificate of Approval revokes and replaces Certificate(s) of Approval No. 0816-7H9NL3, 3-1359-81-006, 3-0886-87-006 issued on August 11, 2008, December 18, 1981, July 22, 1987

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Section 53, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted sewage works are approved under Section 53 of the Ontario Water Resources Act.

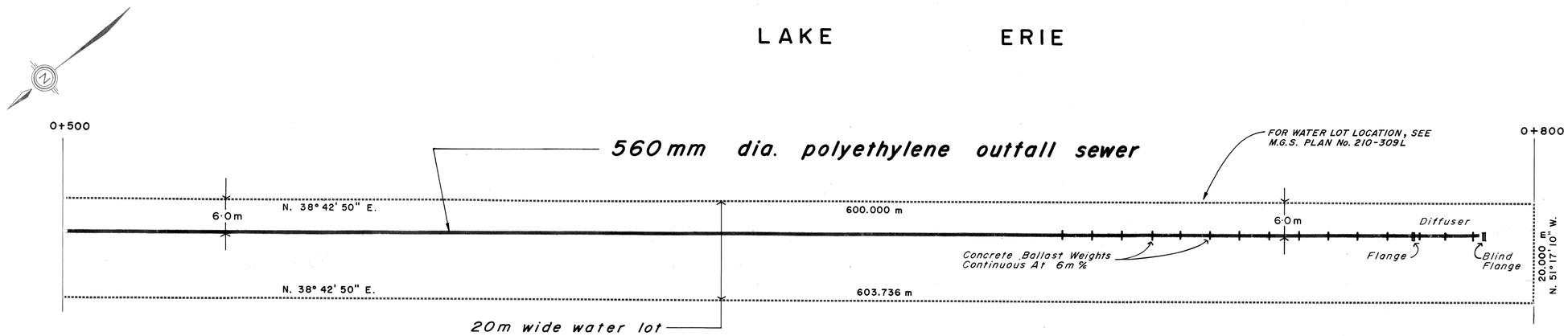
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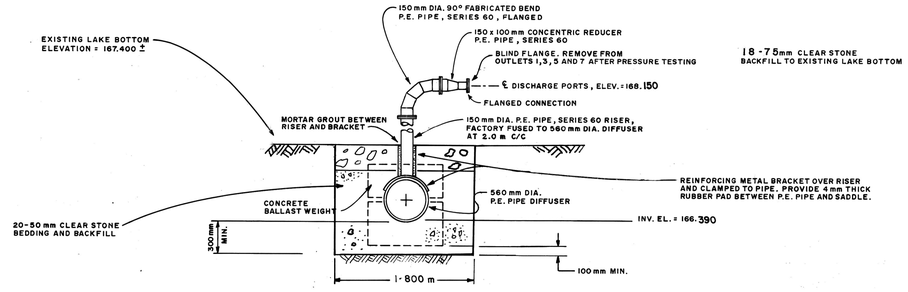
DATED AT TORONTO this 28th day of May, 2009

Mansoor Mahmood, P.Eng.
Director
Section 53, *Ontario Water Resources Act*

FL/
c: District Manager, MOE Windsor
Dino Buratto, Stantec Consulting Ltd.
Water Standards Section, MOE Standards Development Branch

Appendix B WWTP OUTFALL BATHYMETRY

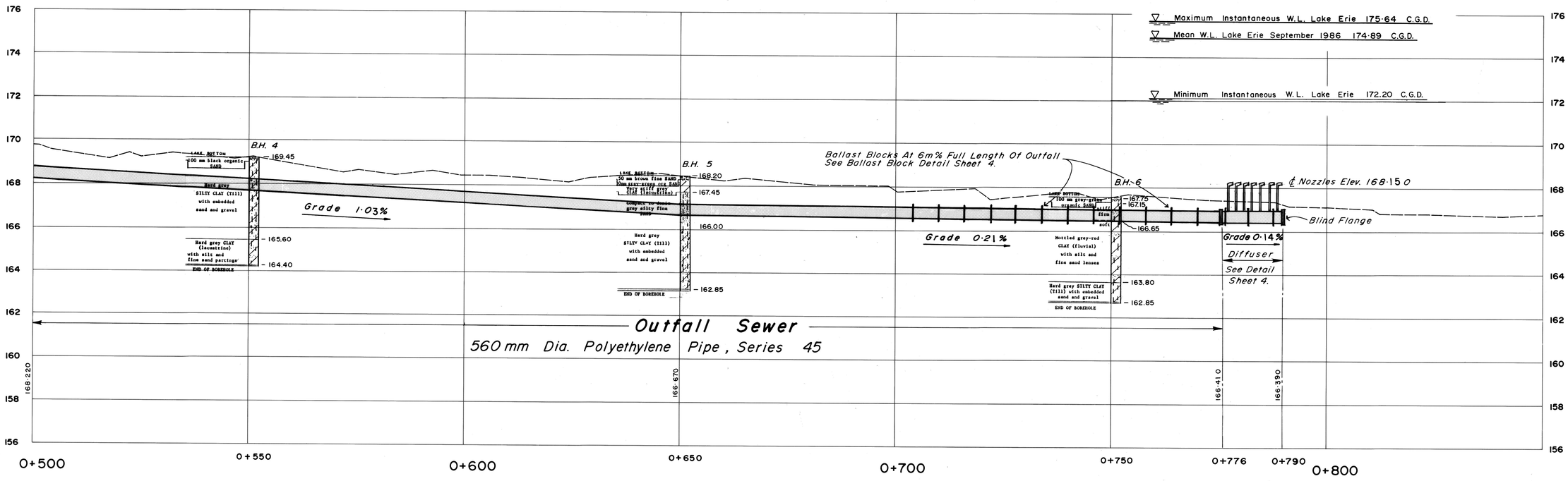




TYPICAL CROSS-SECTION (AT DIFFUSER)

(FROM STA. 0+776 TO STA. 0+790)

SCALE - 1: 40



REVISIONS	BY	DATE
1 CROSS-SECTIONS ADDED	D.W.	88-03-10
2 AS CONSTRUCTED	P.T.B.	89-04-03

ISSUED FOR	BY	DATE
1 APPROVAL	D.A.B.	88-03-30
2 TENDER	D.A.B.	88-04-21

TOWNSHIP OF COLCHESTER SOUTH

PROJECT

TOWNSHIP OF COLCHESTER SOUTH
DIRECT GRANT SEWAGE WORKS

SHEET TITLE

PLAN AND PROFILE
Sta. 0+500 to Sta. 0+800

REGISTERED PROFESSIONAL ENGINEER — CIVIL — D. A. BURATTO — PROVINCE OF ONTARIO

LA FONTAINE, COWIE, BURATTO & ASSOCIATES LIMITED
Consulting Engineers
3260 Devon Drive, Windsor, Ontario N8X 4L4

PROJECT NO. M.O.E. PROJECT No. 3-0040	DRAWN M.D.S.	SCALE Horiz. 1:500 Vert. 1:100	
	CHECKED Y.C.C.	FIELD BOOK	
	DATE 88-04-21	OFFICE FILE NO. CS-128	
CONTRACT NO. 2	SHEET NO. 3	DRAWING NO. LA-2450-2	

APPENDIX D: CONSULTATION

1. Notice of Study Commencement
2. Public Information Centre No.1
3. Public Information Centre No.2
4. Email Packages to Review Agencies
5. Mailout Packages to Local Residents
6. Response from Review Agencies – Notice of Project Commencement
7. Response from Review Agencies – Public Information Centre No.1
8. Response from Public – Public Information Centre No.1
9. Response from Public – Public Information Centre No.2
10. Response from Review Agencies – Notice of Draft ESR
11. Indigenous Consultation Log

APPENDIX D

Notice of Study Commencement

1. Notice of Study Commencement
2. Notice of Study Commencement – Harrow News Advertisement

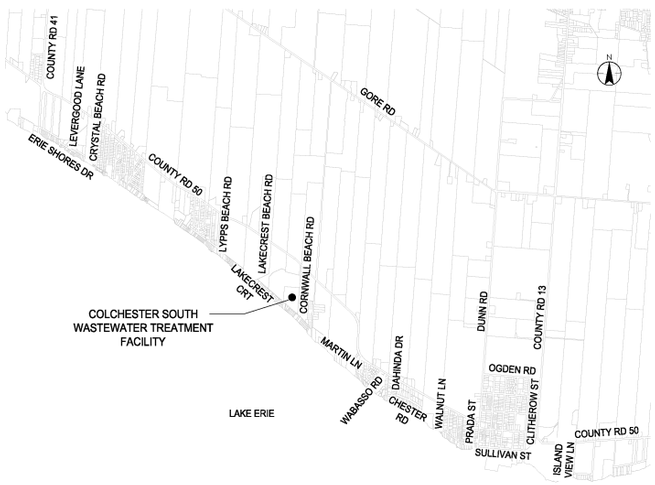
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF STUDY COMMENCEMENT

The Study
The southern portion, or Urban Area, of Colchester South Community of the Town of Essex is serviced with a communal sewage system. Wastewater within this service area is collected by sanitary sewer systems and then conveyed to the existing Colchester South wastewater treatment facility for treatment. The Town has been realizing increasing wastewater servicing demands from significant development pressures within the community area. To ascertain this impact, the Town has initiated a Class Environmental Assessment (Class EA) to expand the existing Colchester South Sewage Works.

The Process
The study is being undertaken in accordance with the planning and design process for 'Schedule C' projects outlined in the Municipal Class Environmental Assessment (June 2000, as amended in 2007, 2011 and 2015) under the Ontario Environmental Assessment Act. The Class EA process includes public and review agency consultation, an evaluation of alternatives, an assessment of the potential environmental effects of the proposed works, and identification of reasonable measures to mitigate any adverse impacts that may result.

Comments
Public participation will form an integral part of this Class EA study to ensure that the concern's of the public and affected groups within the study area are identified, documented and assessed. A Public Consultation Centre will be scheduled during the study to present the findings to date and to collect community feedback and input before finalizing the preferred solution.



Any parties that wish to provide suggestions or comments about this study at this time should do so, preferably in writing, by contacting the individuals identified below.

Town of Essex

David McBeth, C.E.T.
Manager, Capital Works and Asset Management
(519) 776-7336 ext. 1113
dmcbeth@essex.ca

Stantec Consulting Ltd.

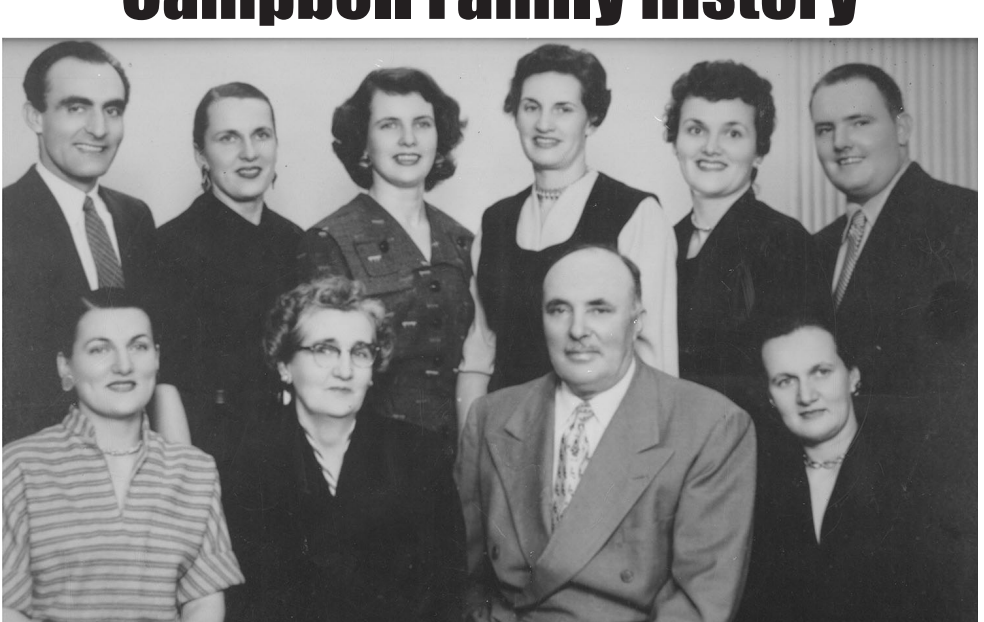
Jian Li, P.Eng.
Project Manager
Phone: 519-966-2250 ext 240
jian.li@stantec.com

Under the Municipal Freedom of Information and Protection of Privacy Act and the Ontario Environmental Assessment Act, unless otherwise stated in the submission, with the exception of personal information, all comments will become part of the public record and will be released, if requested, to any person. Subjective to comments received and the receipt of necessary approvals, the Town of Essex intends to proceed with the planning, design and construction of this project following completion of the Class EA.

(This Notice first issued on August 12, 2022)

Legion
Royal Canadian Legion Branch 338
McAFFEE ST. HARROW 519-738-3582
BAR OPEN
Sunday, August 21st from 1:00 - 6:00 pm

Campbell Family History



The Harrow News recently published a picture of Shirley Kimmery who celebrated her 100th birthday. Below is a bit of history on her family - submitted by Sandra McKee

Manson and Tina Campbell (Grant) moved their family to Colchester in the 1932. They are pictured above front row, middle. The family home is located on Jackson Street in Colchester. The family of 10 lived there until one by one were married and either continued to live locally or moved away. Manse Campbell worked as a fisherman and owned a boat livery and fishery at the bottom of the Jackson Street hill. It was located below where the present community centre is situated. He was harbourmaster for many years. Most of the eight kids and future son-in-laws worked on the fish boat with him or in businesses in Colchester, including McVitties store and dance hall. Paul Martin, former prime minister of Canada held his first job on Manse's fishing boat.

The last of the village family, Shirley, just celebrated her 100th birthday. She is the only sibling still living. Below is a list of the children, their spouses and children. Hopefully many reading this will have been lucky enough to have known some of them.

Pictured back row from the left: Duncan Campbell married Jean, had two sons Manson and Scott and moved to Pittsburg; Winnie married John Novel and moved to Pittsburg; Gwen married Wilfred (Winnie) Little, and moved to Burlington, their children's names - Cathy, Greg, Rick, Susan, Sherry; Elaine married Jim Lonsbery, children Sharon, Brenda & Jim… lived in Oxley on the family farm; Betty married Frank Philcox, children Cheryl, Francine, Marsha, Lonna and Frank…lived in Colchester. Larry married Joyce Tremblay, children Jim and Janet…lived in Colchester.

Pictured in the front left: Shirley married Bill McKee, children Jeff & Chris - later married Ed Kimmerly. Kathleen (far right) married Wes Carter, children - Tom, Alan, Carol, John, Rosemary, Bob and Elaine.



Border Chambers of Commerce ask government to Scrap the App

Submitted to
The Harrow News

A coalition of Chambers of Commerce representing border communities across the country is calling on the Government of Canada to lift the remaining COVID-related border restrictions and to suspend use of the ArriveCAN app.

"The border measures are not only slowing down border crossings, but they're also having a deterrent effect on visitors from the USA," said Windsor-Essex Regional Chamber of Commerce CEO Rakesh Naidu. "The ArriveCAN app is hurting both our tourism industry and our economy in general."

US visits through land ports are still down significantly across the country. Statistics Canada reports that border crossings from the United States in June 2022 were little more than half the number made in June 2019. Tourism spending in Canada is still more than a third below pre-pandemic levels. Wait times at land border crossings have lengthened by up to two hours since 2019 despite traffic being cut in half, and bridge authorities attribute this entirely to restrictions and the ArriveCAN app. The average processing time for arriving passengers at airports has increased by 400%.

"It isn't only affecting the tourism industry," continued Rakesh Naidu. "More than half of the total trade Canada conducts with the United States is by truck. The additional time and resources spent on border measures and the ArriveCAN app slows the crossing for all and puts additional strain on already stretched supply chains."

"The ArriveCAN app is just not effective in its current form," said Rakesh Naidu. "The app's requirement of only the first two doses is not based on our current understanding about Covid-19 vaccination and immunity. Therefore, its effect on limiting the spread of the virus is minimal, while at the same time hurting our tourism sector and economy in general."

The group of border chambers currently includes the Vallee Chamber of Commerce, New Brunswick; the Amherstburg, Fort Frances, Windsor-Essex Regional, Greater Kingston, Sarnia Lambton, and Greater Niagara Chambers of Commerce in Ontario; and the Crystal City & District Chamber of Commerce in Manitoba. All have called upon the Government of Canada to lift the restrictions and cease the use of the ArriveCAN app for the benefit of their communities and their local economies.

Making it Easier and Faster to Renew Ontario Photo Cards

The Ontario government is making it more convenient for people to keep their government-issued identification and permits up to date. Holders of Ontario Photo Cards can now sign up for free reminders by email, text, or phone call 60 and 30 days before it is time to renew, providing a convenient way to get notified when the photo cards are set to expire. All Ontarians are also encouraged to sign up for free digital renewal reminders for health cards, driver's licences and licence plates.

It is important for Ontarians to keep their licence plate, driver's licence, health card, or Ontario Photo Card up to date to ensure seamless access to critical services and avoid fines or penalties. It's easier, faster, and more convenient to renew now than ever before. Customers can renew online at Ontario.ca/Renew in minutes. Those who need to visit a ServiceOntario centre in person can book an appointment at Ontario.ca/Appointment to make the visit quicker and hassle-free.

Signing up for digital reminders is quick and easy online at Ontario.ca/Reminders or by calling ServiceOntario at 1-800-387-3445 (TTY: 1-800-268-7095).

essex

COLCHESTER SOUTH SEWAGE WORKS EXPANSION CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF STUDY COMMENCEMENT

The Town of Essex is undertaking the Class EA process involving evaluation of alternative solutions and design concepts for the expansion of the existing Colchester South Sewage Works. The Town has been realizing increasing wastewater servicing demands from significant development pressures within the Colchester South Community area.

All content and instructions on how to submit questions or wish to be added to the study mailing list will be available on the Town of Essex's project webpage, **www.essex.ca/ColchesterExpansion**

essex

Town of Essex Notice of Open House on Short Term Rental Units (STRUs)

Meeting Information

An Open House to present information and education to Short Term Rental Unit (STRU) owners, operators, and residents in advance of the initiation of the formal licensing system on September 1, will be held on **Tuesday August 23, 2022, from 6:00pm to 8:00pm** at the **Colchester Community Centre, 100 Jackson Street, Colchester, Ontario.** The Open House will be available for all members of the public to attend in person.

More information on STRU regulations in the Town of Essex can be found at **www.essex.ca/STRs**. Questions and comments on the licensing system can also be submitted to **str@essex.ca**. If you wish to be added to the STRU mailing list to be informed of future notifications, please contact **str@essex.ca**.

Publication of Personal Information

Personal information is collected and disclosed pursuant to the provisions of the Municipal Freedom of Information and Protection of Privacy Act.

Public notice placed by:
Robert W. Auger
Town Solicitor/Clerk
Tel: 519-776-7336 extension 1132
Fax: 519-776-8811
Email: rauger@essex.ca

APPENDIX D

Public Information Centre No.1

1. Notice of Public Information Centre No.1
2. Notice of PIC – Harrow News Advertisement
3. PIC No.1 Sign in Sheet
4. PIC No.1 Feedback Form
5. PIC No.1 Presentation

COLCHESTER SOUTH SEWAGE WORKS EXPANSION
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE

The Town of Essex is undertaking a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the expansion of the existing Colchester South sewage works. This study will satisfy Phases 1, 2, 3 and 4 of the Class EA process which will involve public and review agency consultation, an evaluation of alternatives, an assessment of the potential environmental effects of the proposed works, and identification of reasonable measures to mitigate any adverse impacts that may result. An Environmental Study Report will be prepared to document the activities and recommendations from the Class EA process.

The Town is hosting a Public Information Centre (PIC) to present the evaluation of alternative solutions for the Colchester South Sewage Works Expansion. Consultation is an integral part of the EA process and members of the public, agencies, and other interested persons are invited to participate in the upcoming PIC.

PUBLIC INFORMATION CENTRE
Wednesday October 26th, 2022
4:00 p.m. – 7:00 p.m.
Colchester Community Centre
100 Jackson St, Harrow, ON

Information regarding this Environmental Assessment can be found on the Town's project website: https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

Following the PIC, comments are welcomed and will be received until November 30th, 2022.

For further information, please contact:

David McBeth, C.E.T.
Manager, Capital Works and Asset Management
519-776-7336 ext. 1113
dmcbeth@essex.ca

Jian Li, Ph.D., P. Eng.
Project Manager, Stantec Consulting
519-966-2250 ext. 240
jian.li@stantec.com

Personal information submitted is collected, maintained, and disclosed under the authority of the *Environmental Assessment Act and the Municipal Freedom of Information and Protection of Privacy Act* for transparency and consultation purposes. Personal information you submit will become part of a public record that is available to the general public, unless you request that your personal information remain confidential.

Kingsville Landmark Recognized with Heritage Designation



The Kingsville Municipal Heritage Advisory Committee presented the Jack Miner Migratory Bird Foundation with an enlarged preview of the plaque it will be receiving to mark the designation of the Jack and Laona Miner House under the Ontario Heritage Act. Pictured are Henry Denotter, foundation board member, Tom Coke, foundation executive director, Kimberly DeYong, chair of the Kingsville Municipal Heritage Advisory Committee, and Sarah Sacheli, the heritage committee's past chair. *Photo credit to our Heritage Advisory Committee member, Anna Lamarche.*

submitted by Kimberly DeYong

A Kingsville landmark was recognized anew at this year's Migration Festival.

The Jack Miner Migratory Bird Sanctuary has received heritage designation for the Jack and Laona Miner House. The designation under the Ontario Heritage Act covers the 1922 brick home and the viewing pond which attracts a constant parade of ducks and other waterfowl.

"We are appreciative of the recognition," said Tom Coke, executive director of the Jack Miner Migratory Bird Foundation. "What this designation means for the foundation is the recognition from the Town of Kingsville for this house, for Jack's legacy and for his place in not only the history of having been part of the Town of Kingsville but also going forward into the future."

Miner was an internationally renowned naturalist, conservationist, lecturer, businessman and author. Until his death in 1944, he was one of Canada's most prominent citizens, his life chronicled in newspaper reports, encyclopedia entries and history books. Miner pioneered the banding of migratory waterfowl, leading to the enacting of conservation treaties between Canada and the United States. His wife, Laona, was a charter member of the Kingsville Women's Institute, an organization dedicated to the advancement of education for women and girls, and she hosted countless events in her home to support local charities.

"It is important to recognize Laona's contribution to the sanctuary's legacy," said Coun. Kimberly DeYong, chair of the Kingsville Municipal Heritage Advisory Committee. "When Jack would go on speaking engagements, Laona would accompany him. When he would bring notable people such as Marilyn Munroe, Ty Cobb or Henry Ford to their home, Laona would host them. Of the work it took to found the sanctuary and keep it going, we have seen photos of her creating leg bands right alongside her husband."

The property's heritage value lies not only in its association with Jack and Laona Miner, but for its architectural design and its state of preservation, DeYong explained. The site has remained largely unchanged through the decades and continues to be the centrepiece of a Crown game reserve established by the Province of Ontario in 1917. While the exterior of the home epitomizes the Edwardian Classical style of architecture, it has Arts and Crafts or Craftsman details inside including a built-in buffet, cabinetry and other woodwork made of quarter-sawn oak.

The Miners could afford such a well-appointed home because of the success of the Miner Tile and Brick Yard, which flourished because of the pace of construction throughout the southern part of Essex County at the time.

The Royal Agricultural Winter Fair
November 4 to 13

Hosted at Toronto's Exhibition Place, The Royal will showcase the very best in Canadian agriculture, local food and equine excellence - just as it has done since the first Fair opened its doors in 1922.

Michael TOMEK LR 519-738-2562
REALTY LIMITED Brokerage
Check out our website at www.tomekrealty.com

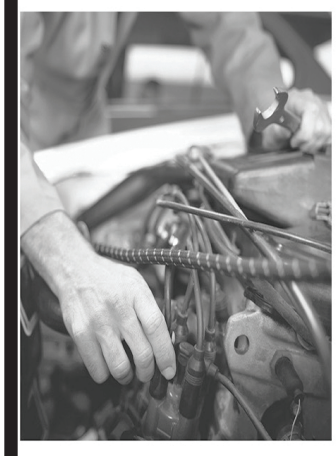
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TECH-NET Professional AUTO SERVICE

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essex

NOTICE OF PUBLIC INFORMATION CENTRE

COLCHESTER SOUTH SEWAGE WORKS EXPANSION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

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4:00 p.m. – 7:00 p.m.
Colchester Community Centre
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David McBeth, C.E.T.
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TOWN OF ESSEX
CLASS ENVIRONMENTAL ASSESSMENT
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
PUBLIC INFORMATION CENTRE
Colchester Community Centre
October 26th, 2022 – 4:00 p.m. to 7:00 p.m.
SIGN-IN SHEET

No.	Name (Please Print)	Address	Telephone Number
1			
2			
3			
4			
5			
6			
7			
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9			
10			
11			
12			

PUBLIC INFORMATION CENTRE
COMMENT FORM

COLCHESTER SOUTH SEWAGE WORKS EXPANSION

The southern portion, or Urban Area, of Colchester South Community of the Town of Essex is serviced with a communal sewage system. Wastewater within this service area is collected by sanitary sewer systems and then conveyed to the existing Colchester South wastewater treatment facility for treatment. The Town has been realizing increasing wastewater servicing demands from significant development pressures within the community area. To ascertain this impact, the Town has initiated a Class Environmental Assessment (Class EA) to expand the existing Colchester South Sewage Works.

This study will include an opportunity and problem statement, evaluation of alternative solutions, evaluation of alternative design concepts, and recommendations for the preferred design. This assessment will include consideration for potential environmental, social, and economic impacts as well as measures to mitigate adverse impacts.

THANK YOU

Public participation will form an integral part of this Class EA study to ensure that the concerns of the public and affected groups within the study area are identified, documented, and assessed. Thank you for your interest in this project and attendance at this public information centre.

Copies of the Public Information Centre material are available on the Town's project website below:

https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

Please return your completed comment form on or before November 30th, 2022, to:

Hannah Rindlisbacher, E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 226-268-3033
hannah.rindlisbacher@stantec.com

Attention: Hannah Rindlisbacher
Stantec Consulting Ltd.
2555 Ouellette Avenue, Unit 100
Windsor ON
N8X 1L9

Stantec

COLCHESTER SOUTH SEWAGE WORKS EXPANSION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the Colchester South Sewage Works Expansion:

NAME _____

EMAIL ADDRESS _____

TELEPHONE NO. ( ) _____

DATE_____SIGNATURE _____

Stantec

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Town of Essex

COLCHESTER SOUTH SEWAGE WORKS EXPANSION

PUBLIC INFORMATION CENTER

WELCOME

Municipal Class Environmental Assessment (Class EA)

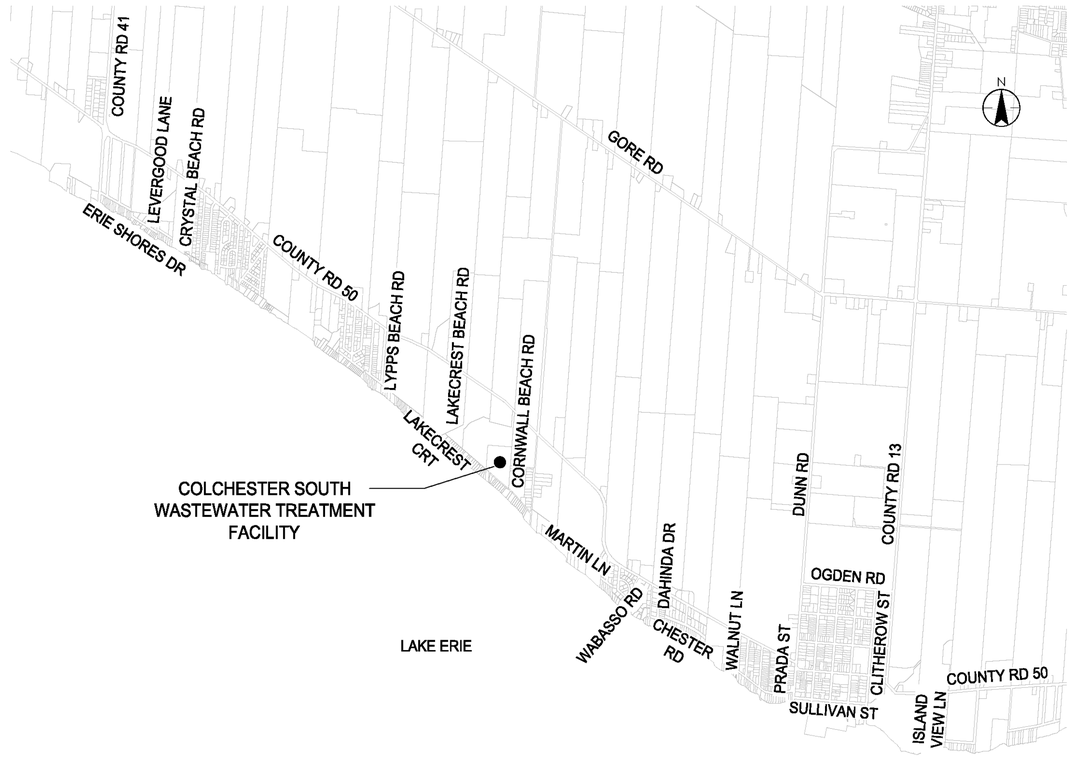
October 26th, 2022

Study Overview

The purpose of this study is to determine the preferred solution and conceptual design to accommodate increasing wastewater servicing demands in the community of Colchester South.

The purpose of this Public Information Center (PIC) is to:

- Introduce the study background, problem / opportunity statement, and describe the Class EA process
- Present an evaluation of alternative solutions to accommodate increased development within the community
- Obtain public feedback on the preferred solution



Background
Colchester South Sanitary Servicing Area

The Colchester sanitary sewer system was designed and constructed in the 1980's. Based on this original design, the sanitary service area boundaries are as follows:

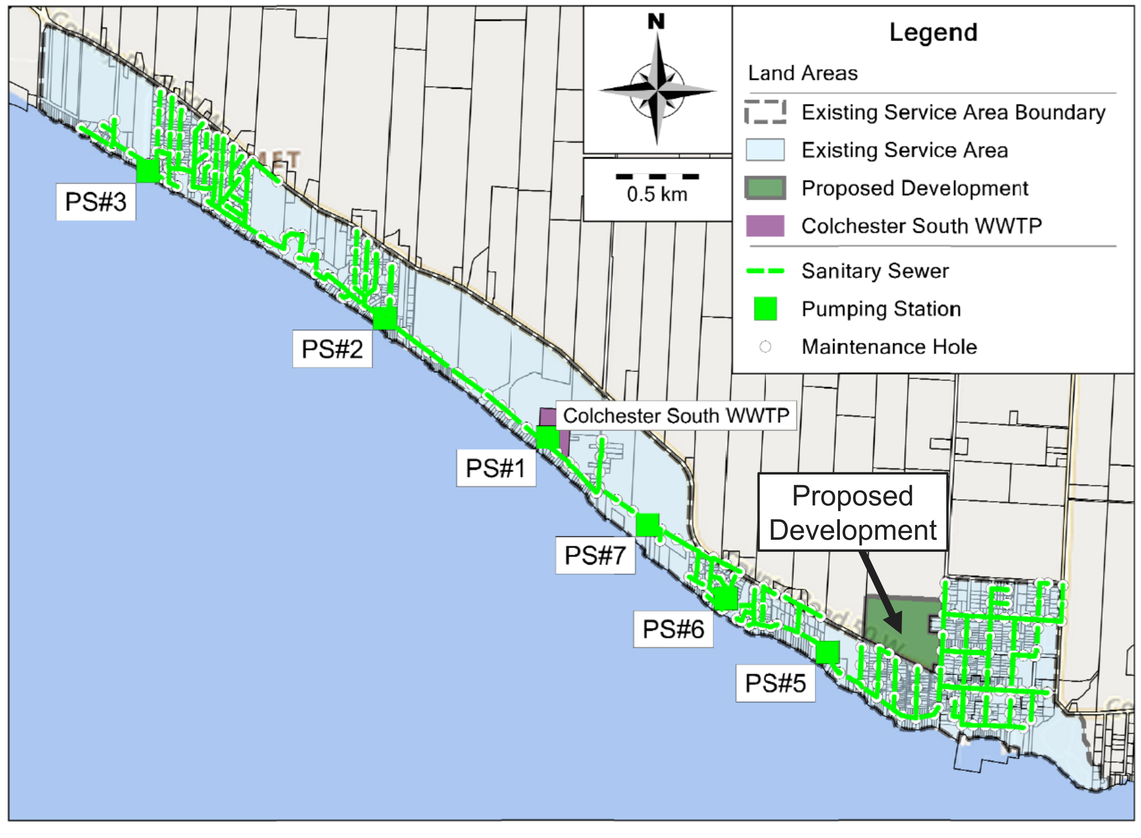
North → Ogden Street / County Road 50

East → County Road 13 / Island View Lane

South → Lake Erie

West → County Road 41

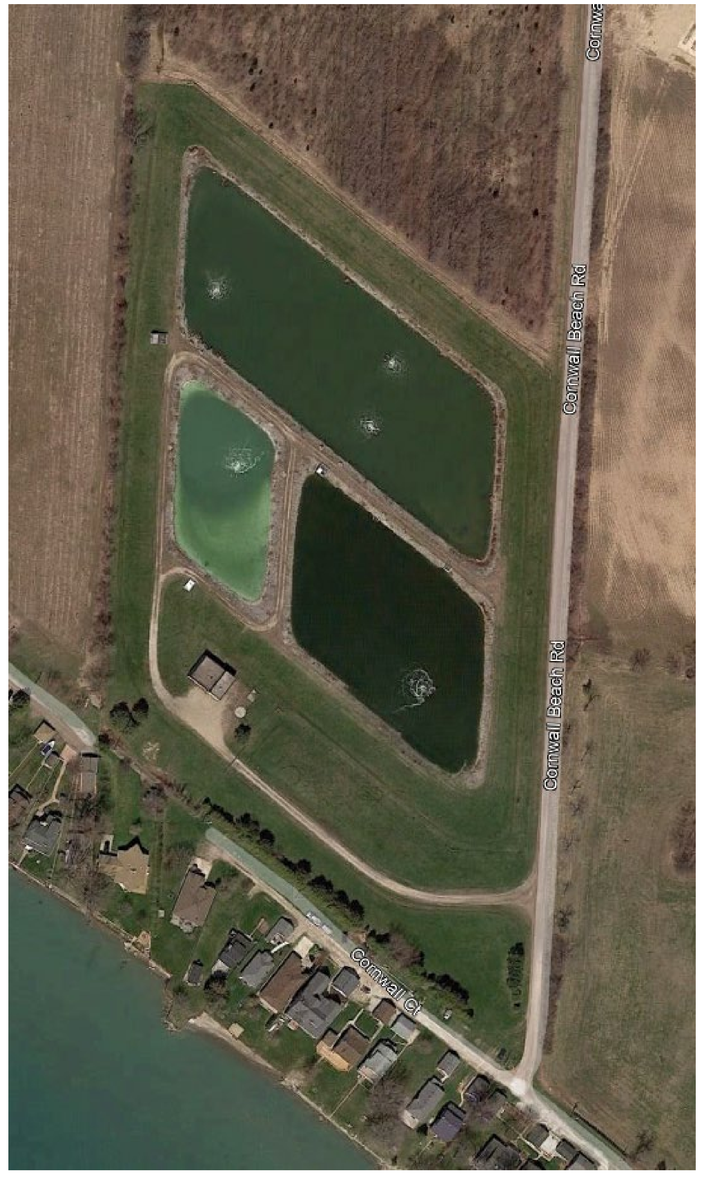
- The existing sanitary collection system consists of a gravity sewer system with six pumping stations
- All wastewater is directed to Pumping Station No.1 where it is pumped by to the Colchester South Wastewater Treatment Plant (WWTP)



Background
Colchester South Wastewater Treatment Facility

The Colchester South WWTP is located on a 12.16-hectare parcel of land approximately 500 m south of County Road 50 with access off Cornwall Beach Road, it consists of:

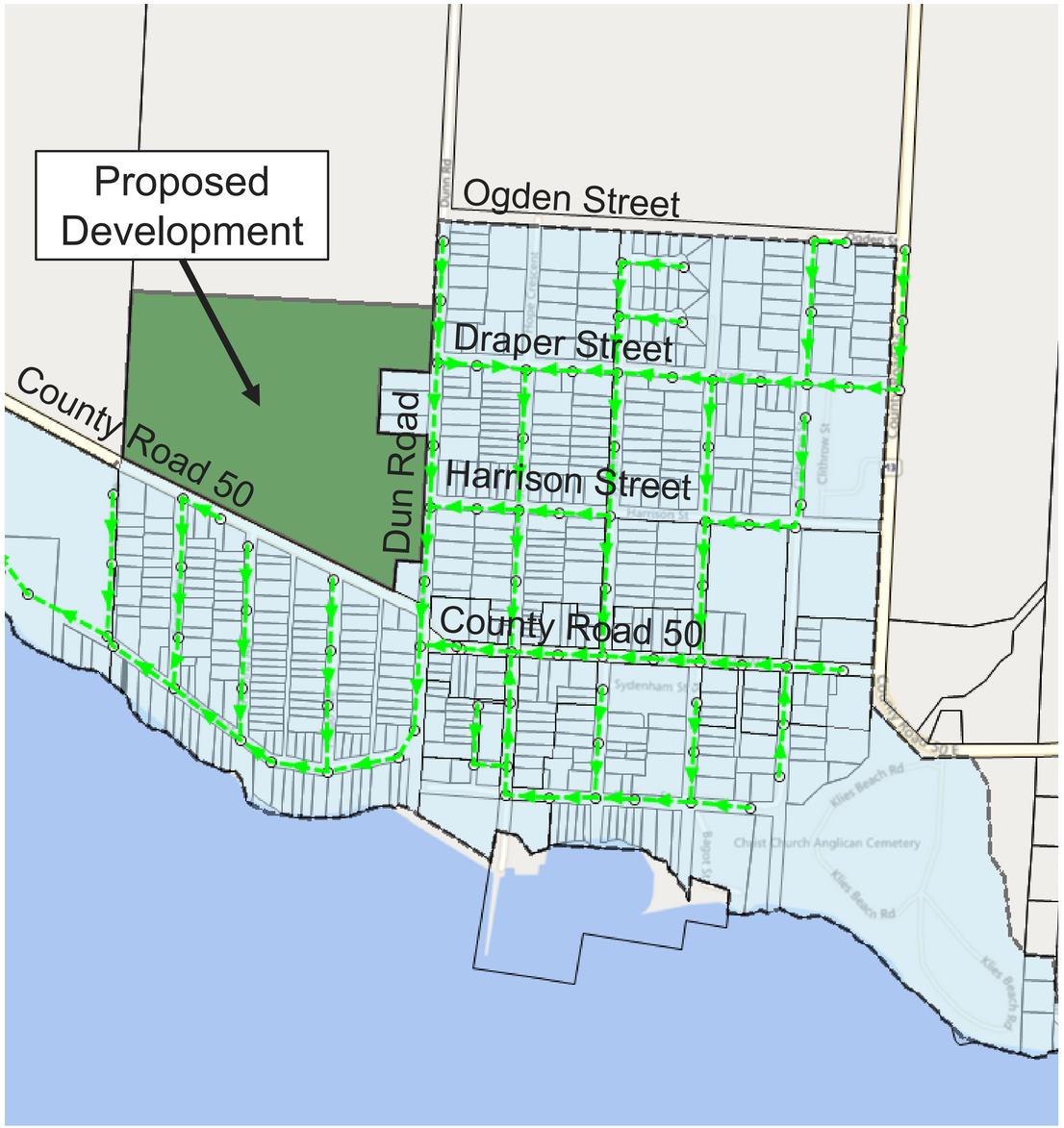
- Three cell aerated facultative sewage lagoon system
- Rated capacity of 1,816 m^3/day
- Peak flow capacity of 8,122 m^3/d
- Good historical operating performance



Parameter	Ministry of Environment Conservation and Parks Non-Compliance Limit	Historical Operating Data (2015-2021) Final Effluent Concentration
$cBOD_5$ (mg/L)	25	5.9
TSS (mg/L)	30	14.9
TP (mg/L)	1.0	0.08

Opportunity Statement
Proposed Development

- A new eco-development is proposed west of the Colchester Urban Centre
- This development would include:
  - Mixed Style Residential Units
  - Parkland
  - Hotel with Commercial Retail Space
- This development has the potential to generate socio-economic and environmental benefits within the community
- This development would generate an increase in wastewater servicing demands beyond the capacity of the existing Colchester South Sewer Works



Opportunity Statement
Projected Wastewater Flows from Development

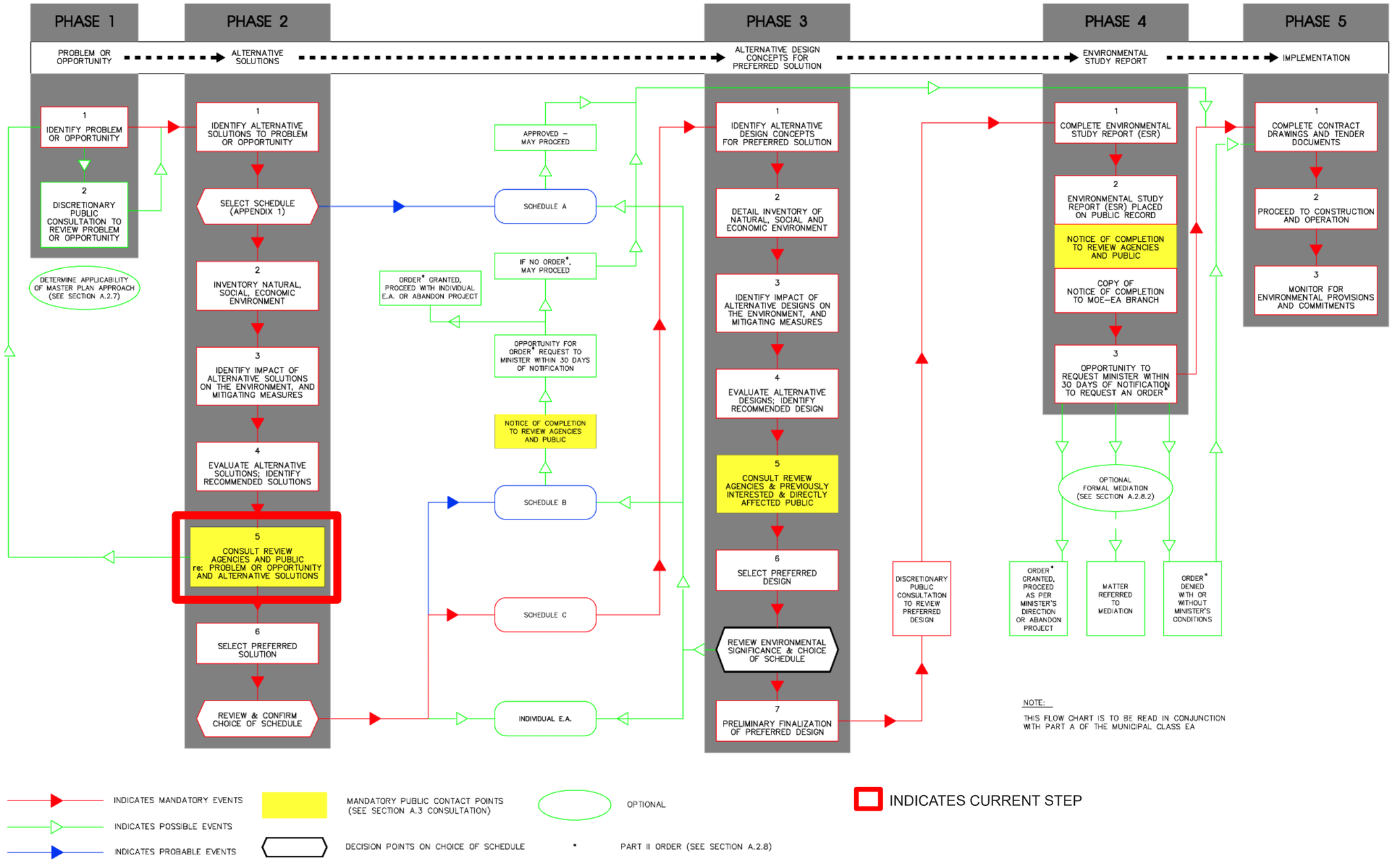
- The Colchester South WWTP's current rated capacity is 1,816 m^3/d
- Wastewater flow from the current service area is approximately 1,040 m^3/d

The estimated wastewater flow from the proposed development is outlined below:

Estimated Wastewater Flows from the Proposed Development	
Average Daily Sewage Flow	1,396 m^3/d
Peak Sewage Flow	3,841 m^3/d

- The combined average daily flow from the existing service area and the proposed development would be greater than the firm capacity of the Colchester South WWTP
- This study will evaluate alternative design solutions and concepts to accommodate wastewater flows from this development

Background
Overview of the Class EA Process



Background
Key Features of the Class EA Process

The project is being conducted in accordance with the Class EA requirements for 'Schedule C Projects':

Municipal Class EA Phases	
Phase 1 – Review and identify problem or opportunity	This EA Study
★ **Phase 2 – Alternative solutions to problem**	This EA Study
Phase 3 – Alternative design concepts for the preferred solution	This EA Study
Phase 4 – Prepare Environmental Study Report	This EA Study
Phase 5 – Implementation of the preferred design	Future Work

Alternative Solutions
Evaluation Criteria

Component	Evaluation Criteria
Technical Suitability	• Ability to meet current and future wastewater servicing needs • Constructability, implementation timeline, and phasing • No adverse impacts on existing infrastructure (operations and/or maintenance)
Social	• Impact to archaeological, built heritage, and cultural heritage • Noise, vibration, odour, or air pollution emissions • Permanent changes or impacts to society / community • Development policies and agreements • Ability to increase development and improve housing supply
Natural Environment	• Impacts to vegetation, fish and wildlife, areas of natural and scientific interest, environmentally sensitive areas, and soil / geology
Economic	• Capital, operational and maintenance (O&M) costs • Ability to improve development and generate economic growth

Alternative Solutions

Overview

Alternative Solutions considered in this phase to accommodate increased development within the community include:

Alternative 1: Do Nothing

Alternative 2: Restrict Community Growth

Alternative 3: Reduce Sewage Flows and Inflow and Infiltration (I&I)

Alternative 4: Modify Operation of Existing Infrastructure

Alternative 5: Discharge to WWTP Outside of Colchester South Community

Alternative 6: Independent On-Site WWTP

Alternative 7: Expand and Upgrade Colchester South Sewage Works

Alternative Solutions
Screening of Alternatives

Alternative	Screening Result
1: Do Nothing	Not carried forward since it has adverse economic impacts and results in stagnation of development.
2: Restrict Community Growth	Not carried forward since it has adverse economic impacts and results in stagnation of development.
3: Reduce Sewage Flows and I&I	Not carried forward because reducing the sewage flow by repairing infrastructure and minimizing I&I will not recover sufficient capacity in the existing treatment facilities to accommodate new development pressures.
4: Modify Operation of Existing Infrastructure	Not carried forward because modifications, such as sludge removal to increase hydraulic capacity or operating at a depth that exceeds design standards, would not recover sufficient capacity to accommodate the new development and projected community growth.
5: Discharge to WWTP Outside of Colchester South Community	Not carried forward due to significant cost. The nearest sewage treatment facility is the Harrow WWTP. Discharging to this facility would require construction of a 5 km sewage pipeline, modification to the existing inlet pumping station, and expansion of the Harrow WWTP.
6: Independent On-Site WWTP	Carried forward to detailed evaluation.
7: Expand and Upgrade Colchester South Sewage Works	Carried forward to detailed evaluation.

Alternative Solutions
Evaluation of Alternatives

Evaluation Criteria	Alternative 6: Independent On-Site WWTP	Alternative 7: Expand & Upgrade Colchester South Sewage Works
Technical	• More complex construction and operation • Rigid implementation timeline and phasing • Less flexible to adjust to future needs	• Less complex construction and operation • Flexible implementation timeline and phasing • More flexible to adjust to future needs
Social	• WWTP would be <1 km from the Town Center • Outlet would be approximately 600 m upstream of the Colchester Harbor and Beach	• Negligible impacts to the society
Environment	• Minimal impact to the natural environment • Complicated approval and permitting process	• Minimal impact to the natural environment • ECA Amendment
Economic	• Higher capital investment and O&M cost	• Lower capital investment and O&M cost

Alternative 7 appears to be more favorable than Alternative 6.

Alternative 7
Expand & Upgrade Colchester South Sewage Works

Average Daily Wastewater Flows at the Colchester South WWTP		
Description	**Existing Flow**	**20-Year Design Flow**
Flow from Current Service Area	1,037 m^3/d	1,816 m^3/d
Flow from Proposed Development	+ 1,396 m^3/d	+ 1,396 m^3/d
Total Projected Flow	2,433 m^3/d	3,212 m^3/d

- Existing Colchester South WWTP's rated capacity is 1,816 m^3/d
- Projected average daily flow would be greater than the existing firm capacity
- WWTP upgrades are recommended

Peak Wastewater Flows at the Effected Pumping Stations				
Pumping Station	1	5	6	7
Flow from Existing Dwellings + Proposed Development	102 L/s	52 L/s	56 L/s	66 L/s
Pumping Station Firm Capacity	94 L/s	42 L/s	49 L/s	53 L/s

- Pumping Station's 1, 5, 6, and 7 would operate above capacity
- Pumping Station upgrades are recommended and may be completed in phases

Next Steps

Complete Phase 3 and 4 Class EA Process:

- Review alternative design concepts to expand and upgrade the existing Colchester South Sewage Works
- Select the preferred design, which satisfies wastewater servicing requirements for proposed development, minimizes undesirable impacts on the natural, social and economic environment, and is acceptable to the public and regulatory agencies
- Prepare Environmental Study Report (ESR) documenting the activities and recommendations from the Class EA process
- Complete ESR including all relevant inputs
- Place ESR on public record

Thank You

Please visit the Town of Essex's project website to submit a feedback form.

https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

APPENDIX D

Public Information Centre No.2

1. Notice of Public Information Centre No.2
2. Notice of PIC – Harrow News Advertisement
3. PIC No.2 Sign in Sheet
4. PIC No.2 Feedback Form
5. PIC No.2 Presentation

COLCHESTER SOUTH SEWAGE WORKS EXPANSION
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE

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PUBLIC INFORMATION CENTRE NO.2
Wednesday March 22nd, 2023
4:00 p.m. – 7:00 p.m.
Colchester Community Centre
100 Jackson St, Harrow, ON

Information regarding this PIC can be found on the Town's project website starting from March 22, 2023: https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

Following the PIC, comments are welcomed and will be received until April 30th, 2023.

For further information, please contact:

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Manager, Capital Works and Asset Management
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dmcbeth@essex.ca

Jian Li, Ph.D., P. Eng.
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Essex Town Council Meeting Notes from Monday, March 6, 2023

(continued from page 8)

In the municipal report, it was noted that the canteen has had three different operators since 2012. When the previous operator notified the town that they planned to move out of the Colchester location for the 2023 season, administration issued a Request for Proposal in November 2022.

Three potential proprietors attended a mandatory site meeting to operate the Colchester canteen for the 2023 season, and a proposal was submitted for consideration to the Town of Essex. The Town of Essex had an administrative team of four representatives who independently judged the proposals in several categories. They included the proponents' qualifications, experience, understanding of the proposal intent, business plan, and pricing when making their consideration.

Ice Cool Treats, which already operates one location on Talbot St. South in Essex Centre, was represented by Patricia Cacilhas in the proposal. The municipal report noted the proponent met all requirements of the scope to operate the canteen and scored highest amongst the team of evaluators on the proposals submitted.

Ward 4 Councillor Rodney Hammond, noting Deputy Mayor Rob Shepley's involvement with Ice Cool Treats, asked if there was the possibility of pressure on town staff when it came to the decision making process.

"When they're deciding on who gets awarded these leases, if there isn't some pressure on them when they know that a councillor or someone from the town is putting in a submission, and if there isn't a way that it can be anonymous when the process is being put through so they don't have that weighing on their decision," said Hammond.

Hammond clarified that he did not mean to imply that there was actual pressure in this particular case.

Essex Director of Community Services Jake Morassut said that the four person administrative panel works independently in the decision making process, and in accordance with the procurement policy, a conflict of interest was declared by the proposing party.

"We did a comprehensive review process in several different categories, such as understanding, proposals, menu items, etcetera. That was done with the ratings coming out, and then those are all added up and averaged out and the successful proponent was Ice Cool Treats," said Morassut.

Essex Director of Corporate Services Kate Giurissevich added that it would be difficult for the administrative panel to score a potential vendor without a name on the application, as background reference checks are part of the selection process.

Ice Cool Treats will pay a monthly rate of $700 plus HST while in operation. If Ice Cool Treats wishes to continue the lease after the first year, the monthly lease rate would incur changes matching the yearly consumer price index.

Update on Main Street Accelerator Program

Council received a report prepared by Essex Manager of Economic Development Nelson Silveira, providing a final update on the My Main Street Local Business Accelerator Program.

At the end of 2021, the Town of Essex was approved for federal funding for a Main Street Ambassador one-year contract position. The position would assist with customized market research, data analysis, and non-repayable funding contributions for small businesses in Harrow and Essex Centre downtown areas.

"With that funding, we received a total of $57,500 for a Main Street Ambassador, and an additional $100,000 to distribute to local businesses," said Silveira.

In addition to the dedicated Main Street Ambassador, the program also had ten $10,000 grants available to eligible businesses in Essex Centre and Harrow. Five of the grants were available to existing businesses, while the other five were reserved for new businesses.

In Harrow, a total of 10 businesses took advantage of the opportunity for market research reports. Grants distributed to Harrow businesses included Sanford & Son, who underwent exterior painting and awning replacement, and the Beerded Dog who increased their outdoor patio capacity and improved signage.

"We were happy that we were able to distribute the funding to some really cool projects," said Silveira. "We were able to fill some downtown vacant spaces, beautify the exteriors of some spaces, and give a boost to some of the local businesses that wanted to expand or bring a new product, or marketing activity."

Statement of Remuneration and Expenses Paid received

Council received 2022's Statement of Remuneration and Expenses Paid for members of municipal council and various committee members.

Richard Meloche as Deputy Mayor and Mayor received $37,449.84; Sherry Bondy as Councillor and Mayor received $23,966.35; Steve Bjorkman as Councillor and Deputy Mayor received $20,883.32; Rob Shepley as Deputy Mayor received $3,177.96; Brad Allard as Councillor received $2,665.13; Katie Maguire-Blais as Councillor received $2,667.66; Morley Bowman as Councillor received $18,767.79; Joe Garon as Councillor received $21,387.60; Rodney Hammond as Councillor received $2,665.13; Jason Matyi as Councillor received $16,985.02; Chris Vander Doelen as Councillor received $19,666.79; and Kim Verbeek as Councillor received $21,400.16.

The full document, which is available online through the March 6 Council Meeting Agenda Package, also lists total expenses and addition committee remuneration figures.

'One of the Kind' Grant Application Open to Schools across Essex County

The Rotary Club of Windsor-Roseland is pleased to announce that applications for grants from the *One of the Kind - Acts of Kindness* Program is open. The deadline for applications is Friday, March 31, 2023 and is available to all schools across Essex County.

The *One of the Kind* program is a community development program sponsored by the Rotary Club of Windsor-Roseland. It is designed to educate and engage youth about the power of acts of kindness and how kind acts and gestures, no matter how small, can positively impact the giver, the receiver, and the community

This program provides a limited number of small grants, up to $50 each, to elementary school students to support an act of kindness within the school or the community. Principals and teachers are encouraged to work with their students to apply for grant money.

The application is very brief and the process is very simple. For details and grant applications contact: morrowlinda@hotmail.com or 519-995-0250.

In addition to the grant money, the school will also receive a *One of the Kind* Certificate recognizing their efforts. This is the third year the program has been active and many schools have successfully used their grant money to do a variety of kindness projects that have inspired students.

Don't wait too long. Deadline for sending in grant applications is Friday, March 31, 2023. Deadline for completion of project and report is Friday, May 26, 2023.

It is a simple yet wonderful way to encourage students to be good community citizens and understand the importance and impact of kindness.

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essex

COLCHESTER SOUTH SEWAGE WORKS EXPANSION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

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The Town is hosting a second Public Information Centre (PIC) to present the evaluation of alternative design concepts to upgrade the existing Colchester South Sewage Works and expand the original service area. Consultation is an integral part of the EA process and members of the public, agencies, and other interested persons are invited to participate in the upcoming PIC.

PUBLIC INFORMATION CENTRE
Wednesday March 22nd, 2023
4:00 p.m. – 7:00 p.m.
Colchester Community Centre
100 Jackson St, Harrow, ON

Information regarding this PIC can be found on the Town's project website starting from March 22, 2023: https://www.essex.ca/en/news/Colchester_South_Sewage_Works_Expansion.aspx

Following the PIC, comments are welcomed and will be received until April 30th, 2023.

For further information, please contact:

David McBeth, C.E.T.
Manager, Capital Works and Asset Management
519-776-7336 ext. 1113
dmcbeth@essex.ca

Jian Li, Ph.D., P. Eng.
Project Manager, Stantec Consulting
519-966-2250 ext. 240
jian.li@stantec.com

Personal information submitted is collected, maintained, and disclosed under the authority of the *Environmental Assessment Act and the Municipal Freedom of Information and Protection of Privacy Act* for transparency and consultation purposes. Personal information you submit will become part of a public record that is available to the general public, unless you request that your personal information remain confidential.

TOWN OF ESSEX
CLASS ENVIRONMENTAL ASSESSMENT
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
PUBLIC INFORMATION CENTRE NO.2
Colchester Community Centre
March 22nd, 2023 – 4:00 p.m. to 7:00 p.m.
SIGN-IN SHEET

No.	Name (Please Print)	Address	Telephone Number
1			
2			
3			
4			
5			
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PUBLIC INFORMATION CENTRE NO.2
COMMENT FORM

COLCHESTER SOUTH SEWAGE WORKS EXPANSION

The southern portion, or Urban Area, of Colchester South Community of the Town of Essex is serviced with a communal sewage system. Wastewater within this service area is collected by sanitary sewer systems and then conveyed to the existing Colchester South wastewater treatment facility for treatment. The Town has been realizing increasing wastewater servicing demands from significant development pressures within the community area. To ascertain this impact, the Town has initiated a Class Environmental Assessment (Class EA) to upgrade the existing Colchester South Sewage Works and expand the original service area.

This study will include an opportunity and problem statement, evaluation of alternative solutions, evaluation of alternative design concepts, and recommendations for the preferred design. This assessment will include consideration for potential environmental, social, and economic impacts as well as measures to mitigate adverse impacts.

THANK YOU

Public participation will form an integral part of this Class EA study to ensure that the concerns of the public and affected groups within the study area are identified, documented, and assessed. Thank you for your interest in this project and attendance at this public information centre.

Copies of the Public Information Centre No.2 material are available on the Town's project website below:

https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

Please return your completed comment form on or before April 30th, 2023, to:

Hannah Rindlisbacher, E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 226-268-3033
hannah.rindlisbacher@stantec.com

Attention: Hannah Rindlisbacher
Stantec Consulting Ltd.
2555 Ouellette Avenue, Unit 100
Windsor ON
N8X 1L9

Stantec

COLCHESTER SOUTH SEWAGE WORKS EXPANSION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the Colchester South Sewage Works Expansion:

NAME _____

EMAIL ADDRESS _____

TELEPHONE NO. ( ) _____

DATE _____ SIGNATURE _____

Stantec

Personal information submitted is collected, maintained, and disclosed under the authority of the *Environmental Assessment Act and the Municipal Freedom of Information and Protection of Privacy Act* for transparency and consultation purposes. Personal information you submit will become part of a public record that is available to the general public, unless you request that your personal information remain confidential.

Town of Essex

COLCHESTER SOUTH SEWAGE WORKS EXPANSION

PUBLIC INFORMATION CENTRE NO. 2

WELCOME

Municipal Class Environmental Assessment (Class EA)

March 22nd, 2023

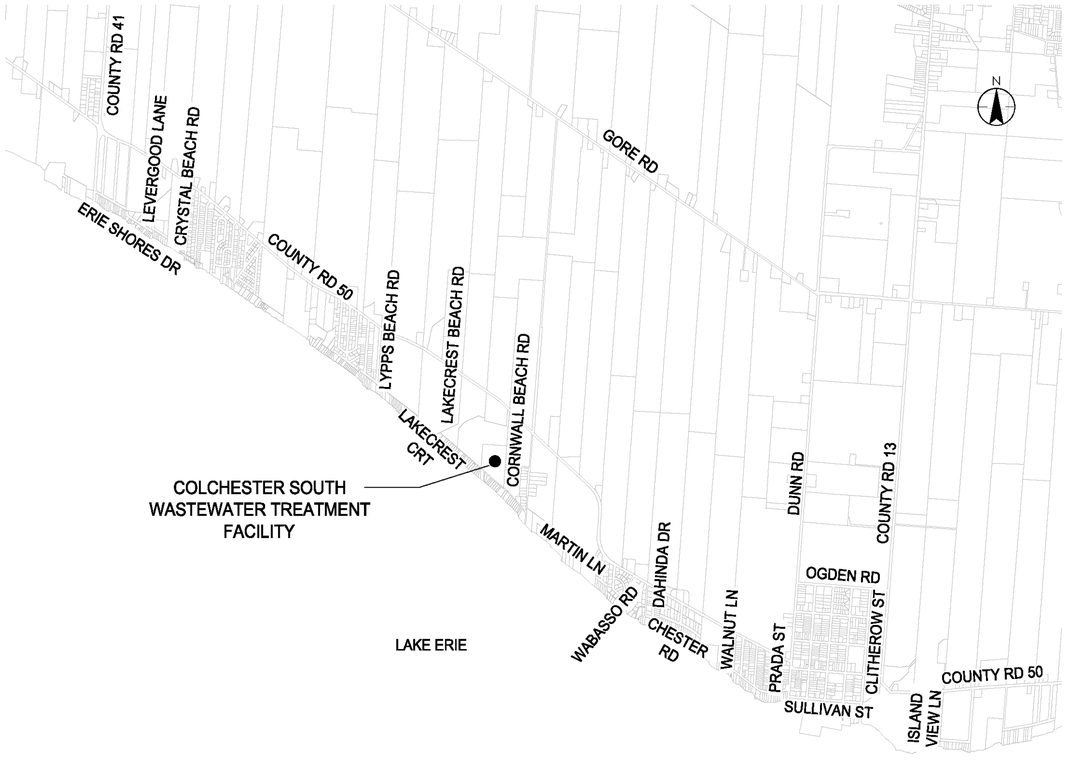
Background

Study Overview

The purpose of this study is to determine the preferred solution and conceptual design to accommodate increasing wastewater servicing demands in the community of Colchester South.

The purpose of this Public Information Centre (PIC) is to:

- Present an evaluation of alternative design concepts to upgrade the existing Colchester South Sewage Works and expand the original service area
- Obtain public feedback on the preferred design concepts



Background

Colchester South Sanitary Servicing Area

The Colchester sanitary sewer system was designed and constructed in the 1980's. Based on this original design; the sanitary service area boundaries are as follows:

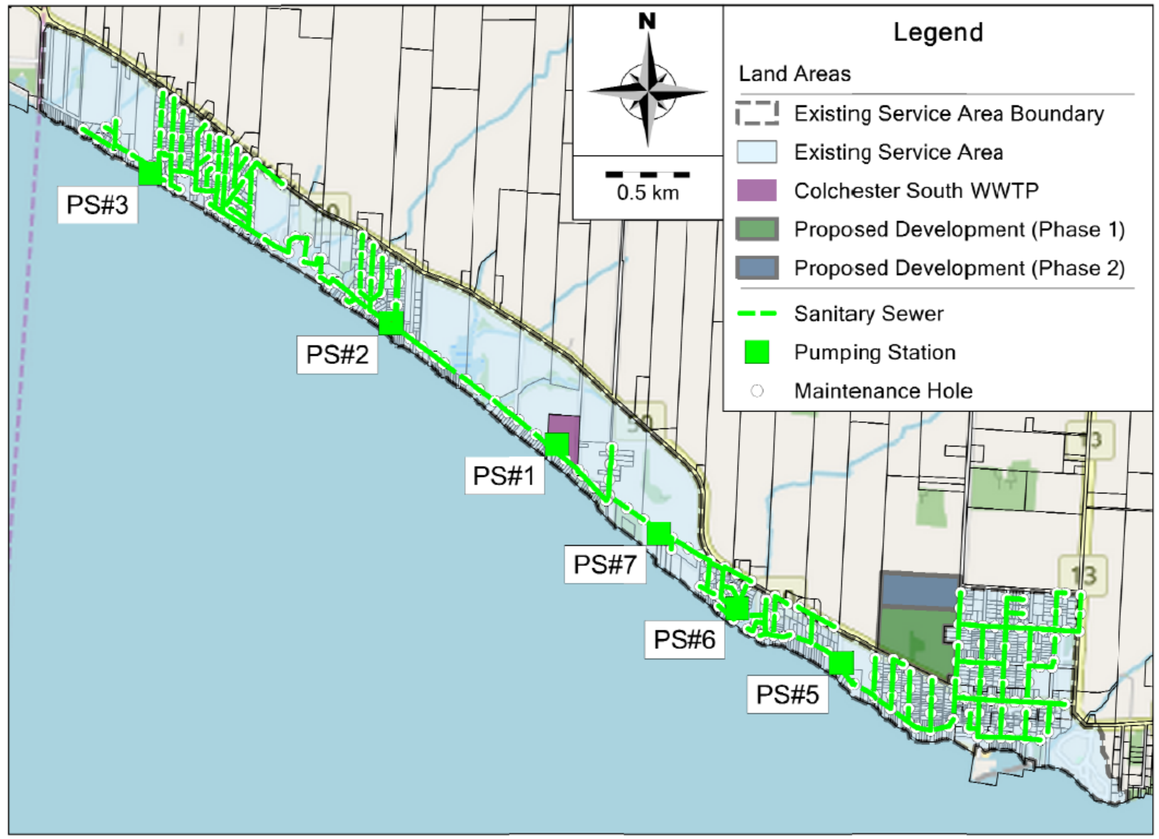
North → Ogden Street / County Road 50

East → County Road 13 / Island View Lane

South → Lake Erie

West → County Road 41

- The existing sanitary collection system consists of a gravity sewer system with six pumping stations
- All wastewater is directed to Pumping Station No.1 where it is pumped to the Colchester South Wastewater Treatment Plant (WWTP)

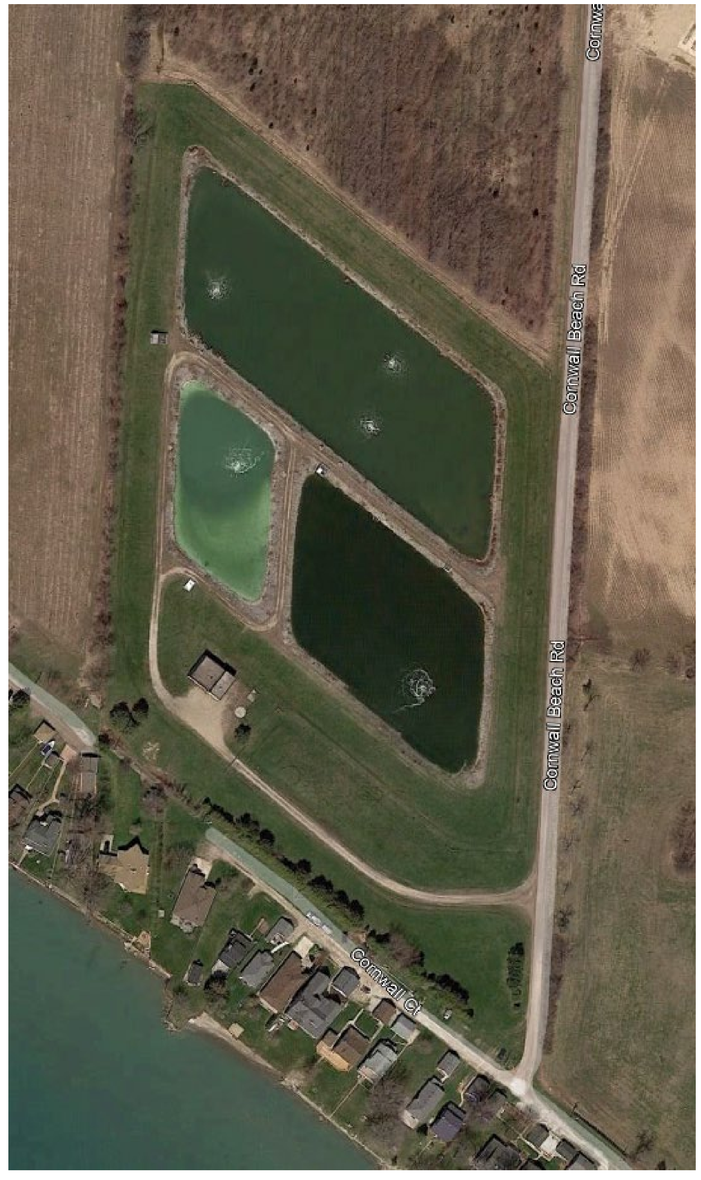


Background

Colchester South Wastewater Treatment Facility

The Colchester South WWTP is located on a 12.16-hectare parcel of land approximately 500 m south of County Road 50 with access off Cornwall Beach Road, it consists of:

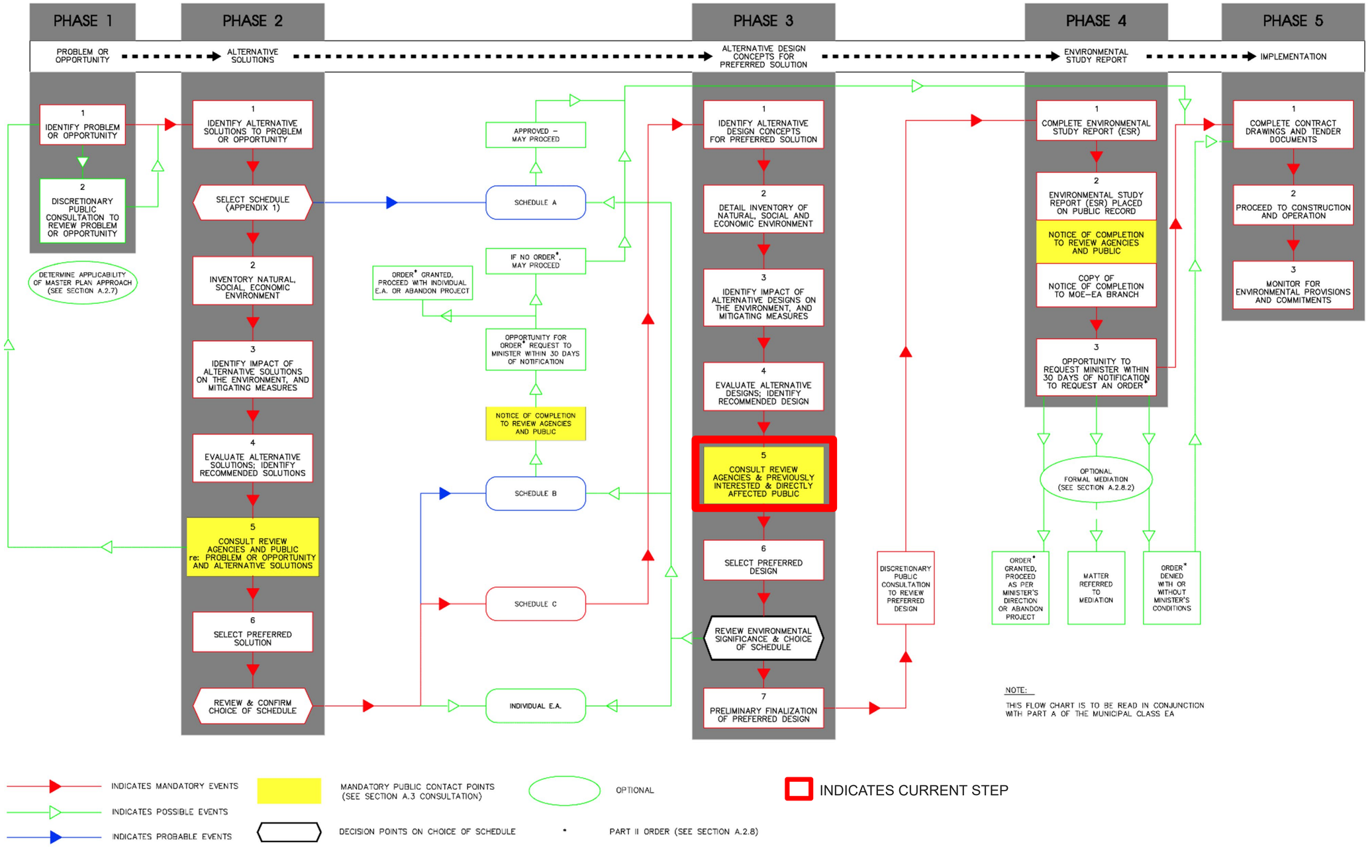
- Three cell aerated facultative sewage lagoon system
- Rated capacity of 1,816 m^3/day
- Peak flow capacity of 8,122 m^3/d
- Good historical operating performance



Parameter	Ministry of Environment Conservation and Parks (MECP) Existing Non-Compliance Limits	Historical Operating Data (2015-2021) Final Effluent Concentration
$cBOD_5$ (mg/L)	25	5.9
TSS (mg/L)	30	14.9
TP (mg/L)	1.0	0.08

Background

Overview of the Class EA Process



Background

Key Features of the Class EA Process

The project is being conducted in accordance with the Class EA requirements for 'Schedule C Projects':

Municipal Class EA Phases	
Phase 1 – Review and identify problem or opportunity	This EA Study
Phase 2 – Alternative solutions to problem	This EA Study
★ **Phase 3 – Alternative design concepts for the preferred solution**	This EA Study
Phase 4 – Prepare Environmental Study Report	This EA Study
Phase 5 – Implementation of the preferred design	Future Work

Phase 1 and Phase 2 Class EA – Completed

- The need for additional wastewater treatment capacity in the Colchester South service area was identified.

- After consultation with review agencies and the public, the preferred solution was determined as follows

    - ***Upgrade the existing Colchester South Sewage Works***

Phase 3 Class EA – Ongoing

- Identify and evaluate the alternative design concepts for the Colchester South Sewage Works Expansion including:

    - Pumping station and collection system upgrades
    - Wastewater treatment technologies
    - Biosolids management strategies

- Preferred design is one that satisfies wastewater collection and treatment criteria, minimizes undesirable impacts on the natural, social and economic environment

This open house is held as part of Phase 3 of the Class EA process.

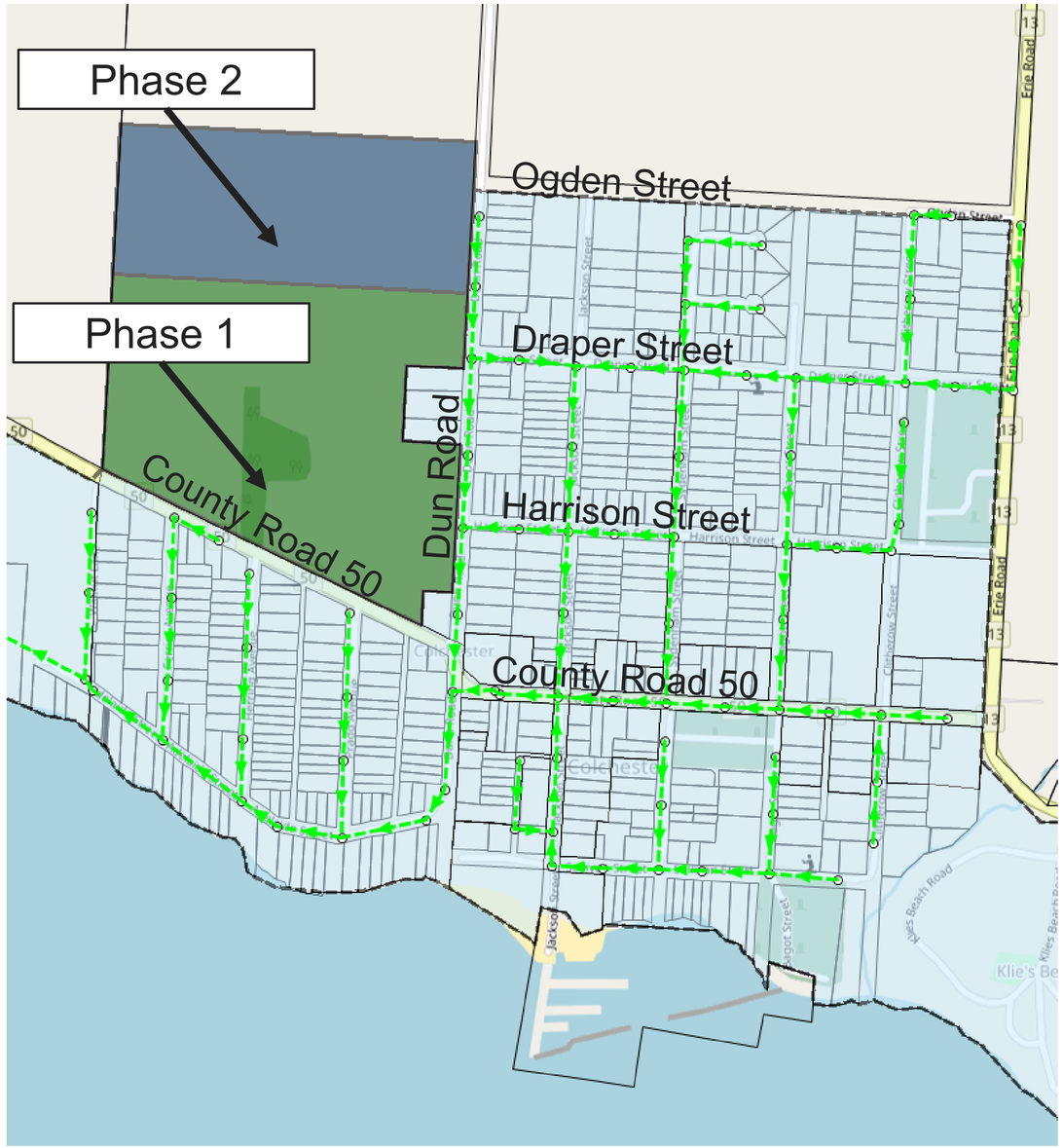
Opportunity Statement

Proposed Development

The Colchester Bay development is proposed west of the Colchester Urban Centre and is outside the existing service area:

- Phase 1 is a proposed addition to the service area
- Potential for Phase 2 as settlement area undergoes a comprehensive review.
- This development would include:
  - Mixed Style Residential Units
  - Parkland
  - Hotel with Commercial Retail Space
- This development would generate a significant increase in wastewater servicing demands

This Class EA was initiated by the Colchester Bay development. The study will determine a long-term solution to accommodate increased wastewater servicing demands from the proposed development as well as other future developments and population growth in the existing Colchester South service area.



Alternative Design Concepts

Overview

Alternative design concepts considered for the Colchester South Sewage Works Expansion fall into the following general categories:

SEWAGE SERVICING ANALYSIS

- Pumping Stations
- Collection System
- Wastewater Treatment Facility

BIOSOLIDS MANAGEMENT STRATEGIES

- Sludge Stabilization
- Sludge Dewatering/Thickening
- Sludge Disposal

WASTEWATER TREATMENT TECHNOLOGIES

- Aerated Lagoons
- Sequence Batch Reactor (SBR)
- Activated Sludge Process (ASP)
- Membrane Biological Reactor (MBR)
- Moving Bed Biological Reactor (MBBR)

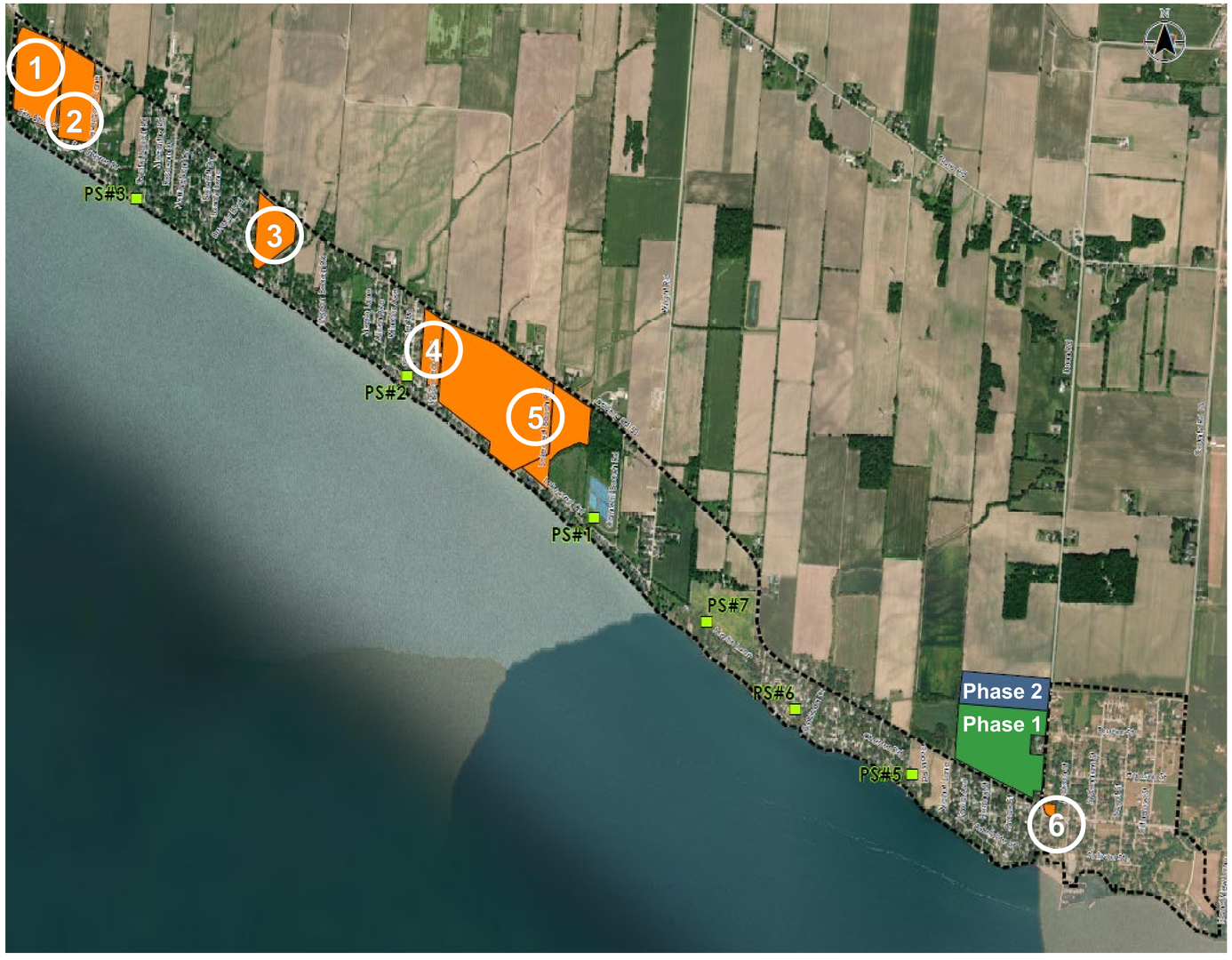
Sewage Servicing Analysis

Service Area Projections

20-year flow and population projections were forecasted based on:

- Natural population increase for Colchester South (Statistics Canada)
- Six (6) proposed developments within the existing service area

Development	Flow (m^3/d)	
	Average	Peak
Existing Service Area	1,249	6,753
1. Erie Blue	164	722
2. Erie Shores	140	623
3. Colchester Heights	85	386
4. Wellesley Drive	54	247
5. Lypps Beach	565	2,308
6. The Grove Motel	5.7	27
TOTAL	**2,262**	**11,066**
Colchester Bay (Phase 1)	817	2,644
Colchester Bay (Phase 2)	579	1,198
TOTAL	**3,659**	**14,907**



Sewage Servicing Analysis

Pumping Stations

Analysis of the pumping stations considered the 20-year population/flow projections and evaluated the impact of the Colchester Bay Development.

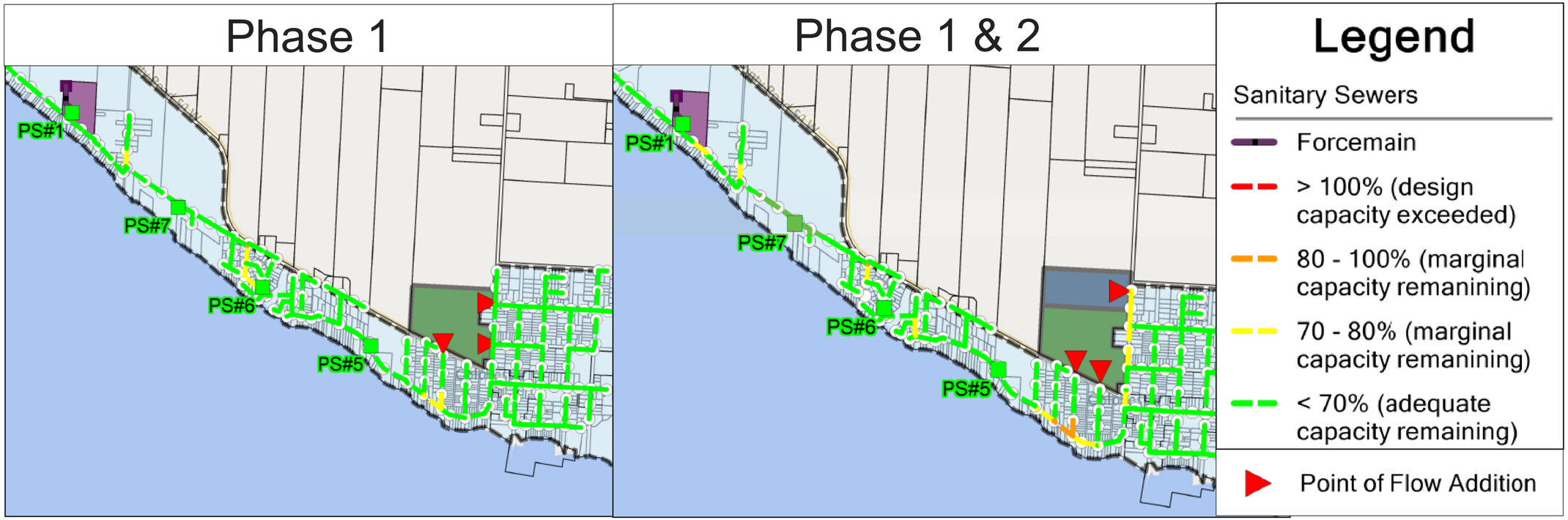
Pumping Station No.	ECA PS CAPACITY	20-YEAR PROJECTION		20-YEAR PROJECTION + COLCHESTER BAY (PHASE 1)		20-YEAR PROJECTION + COLCHESTER BAY (PHASE 1&2)	
	Q_{peak} (L/s)	Q_{peak} (L/s)	Equiv. Pop. (persons)	Q_{peak} (L/s)	Equiv. Pop. (persons)	Q_{peak} (L/s)	Equiv. Pop. (persons)
1	**94.2**	128.1	5,030	158.7	6840	172.5	8,130
2	**34.5**	50.8	1,970	50.8	1970	50.8	1,970
3	**6.5**	19.9	750	19.9	750	19.9	750
4	**-**	-	-	-	-	-	-
5	**42.4**	32.0	1,070	62.6	2880	76.5	4,170
6	**48.7**	38.1	1,270	68.7	3070	82.6	4,360
7	**52.7**	41.4	1,370	72.0	3180	85.9	4,460

- 20-year flow projections for the existing service area indicate that capacity upgrades would be required for pumping station No.’s 1, 2, and 3
- The Colchester Bay Development would result in the need for capacity upgrades at pumping station No.’s 1, 5, 6, and 7

Sewage Servicing Analysis

Sanitary Sewer System

Analysis of the sanitary sewers considered the ultimate population/flow projections within the existing service area and evaluated the impact of the Colchester Bay Development.



No pipe upgrades required assuming the flow from the development is distributed between multiple outlets.

Sewage Servicing Analysis

Wastewater Treatment Facility

A summary of the current capacity of the Colchester South WWTP as well as the historical daily average flow and projected 20-year flow is outlined below:

Colchester South Sewage Servicing Area	Flow (m^3/d)
Current Rated Capacity	1,816
Historical Daily Average	1,040
20-Year Design Capacity (including the Colchester Bay Development)	**3,659**
Ultimate Design Capacity (20+ Years)	7,424

- The historical average daily flow occupies approximately 57% of the rated capacity of the Colchester South WWTP.
- The 20-year flow projection is well above the current rated capacity; therefore, a WWTP capacity upgrade is required to service the Colchester South Community.

Sewage Servicing Analysis

Proposed Effluent Criteria

Effluent Parameter	Objectives		Limits	
	Existing	Proposed	Existing	Proposed
$cBOD_5$ (mg/L)	20.0	10.0	25.0	15.0
Total Suspended Solids (mg/L)	25.0	10.0	30.0	15.0
Total Phosphorus (mg/L)	0.8	0.4	1.0	0.5
Total Ammonia Nitrogen (mg/L)	-	1.0 Summer; 2.0 Winter	-	1.5 Summer; 3.0 Winter
pH	6.5-9.0	6.5-8.5	6.5-9.0	6.5-8.5
E.Coli (cfu/100mL)	-	100	-	200

- The table above includes the existing effluent objectives/limits from the Colchester South Lagoon 2009 Environmental Compliance Approval (ECA)
- The proposed effluent criteria are based on findings from dilution mixing modelling completed as a part of the assimilative capacity study
- The proposed effluent criteria will be finalized based on inputs from the MECP

Alternative Design Concepts

Evaluation Criteria

Component	Evaluation Criteria
Technical Suitability	• Ability to meet current and future wastewater servicing needs • Constructability, implementation timeline, and ease of expansion • Impacts on existing infrastructure (operations and/or maintenance)
Social	• Impact to archaeological, built heritage, and cultural heritage • Noise, vibration, odour, or air pollution emissions • Permanent changes or impacts to society / community
Natural Environment	• Impacts to vegetation, fish and wildlife, areas of natural and scientific interest, environmentally sensitive areas, and soil / geology
Economic	• Capital, operational and maintenance (O&M) costs

Alternative Design Concepts

Wastewater Treatment Technologies

Alternative treatment technologies considered to accommodate increased flows from developments within the community include:

Alternative Technology	Description
1. Aerated Lagoons	• Simple wastewater treatment system • Utilizes large ponds equipped with mechanical aerators to promote mixing and biological treatment of wastewater
2. Sequence Batch Reactor (SBR)	• Enhanced wastewater treatment system • Utilizes multiple tanks operated in parallel to provide equalization, aeration, biological treatment, and clarification
3. Activated Sludge Process (ASP)	• Enhanced wastewater treatment system • Utilizes multiple tanks operated in series to (phase 1) provide aeration and biological treatment and (phase 2) provide clarification
4. Membrane Biological Reactor (MBR)	• Enhanced wastewater treatment system • Utilizes a single tank to provide aeration, biological treatment, and clarification (via a microfiltration membrane)
5. Moving Bed Biological Reactor (MBBR)	• Enhanced wastewater treatment system • MBBR utilizes a similar process to that for ASP with the addition of plastic carriers, known as media, within the aeration tank to increase microbial activity.

Alternative Design Concepts

Evaluation of Wastewater Treatment Technologies

Poor
Fair
Good
Very Good

	Aerated Lagoons	SBR	ASP	MBR	MBBR
Technical Suitability	• Simple O&M • Additional treatment may be required to meet effluent criteria • Simple constructability • Complex expansion • Periodic sludge extraction is a major operation • Sensitive to cold climate	• Complex O&M • No external clarification required to meet effluent criteria • Simple constructability • Simpler expansion • Adaptable to varied flows • Familiar to Essex operators	• Complex O&M • External clarification required to meet TSS effluent criteria • Moderate constructability • Simpler expansion • Proven and common treatment technology for large flow facilities	• Most complex O&M • Pre-treatment required to meet effluent criteria • Simple constructability • Simpler expansion • Performance relies heavily on maintenance	• Complex O&M • External clarification required to meet TSS effluent criteria • Simple constructability • Simpler expansion • Adaptable to varied flows • Resistance to cold climate
Social & Natural Environment	• Large footprint • Higher odour potential • Moderate effluent quality	• Moderate footprint • Lower odour potential • Good effluent quality	• Moderate footprint • Lower odour potential • Moderate effluent quality	• Small footprint • Lower odour potential • Great effluent quality	• Small-Moderate footprint • Lower odour potential • Moderate effluent quality
	Designed in accordance with the MECP Environmental Noise and Vibration Guidelines, which will ensure the appropriate engineering control measures are in place.				
Economic	• Low O&M cost • Low capital cost • Sludge extraction is costly • Requires aeration system	• Moderate O&M cost • Moderate capital cost • Savings on civil work • Requires high efficiency aeration system	• Moderate O&M cost • High capital cost • Requires high efficiency aeration system	• High O&M cost • High capital cost • Requires high efficiency aeration system	• Moderate O&M cost • High capital cost • Requires aeration system
Overall	Fair	Very Good	Fair	Good	Good

Sequence Batch Reactor (SBR) appears to be preferred because it is proven to generate good effluent quality, moderate capital and O&M costs, and it is consistent with the process used at the Essex PCP.

Alternative Design Concepts

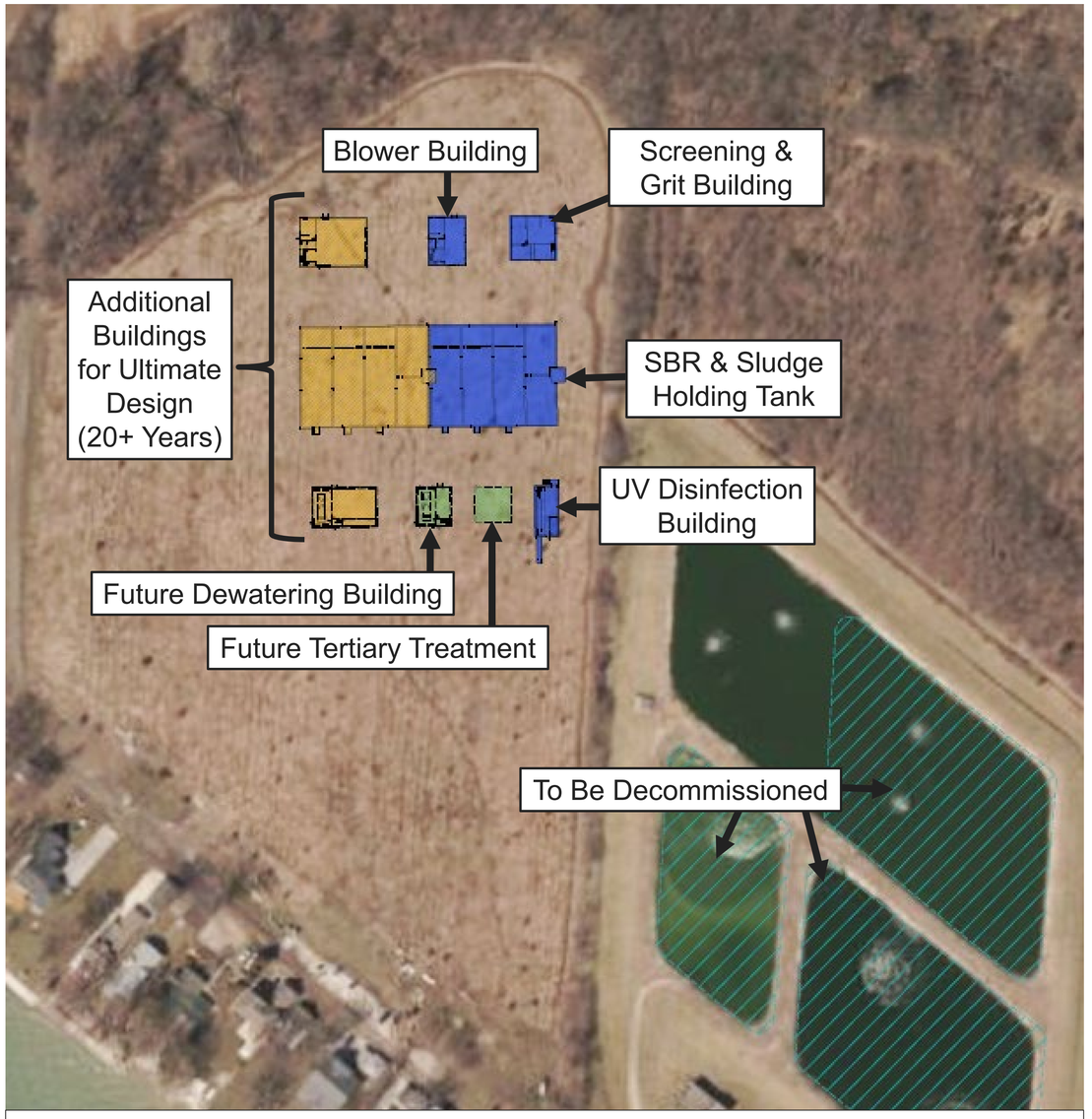
Proposed Layout for Plant Upgrades

The proposed layout for an SBR Plant at the Colchester South WWTP would include:

- Screening & Grit Building
- SBR System with Sludge Holding Tank
- Blower Building
- UV Disinfection Building
- Potential Dewatering Building (Future)
- Tertiary Treatment Unit (Future)

In the detailed design, the future addition of tertiary treatment should be considered, in the case that the MECP requires the proposed facility to meet more stringent effluent criteria, or the facility experiences significant changes in influent characteristics.

The proposed site layout is positioned such that there is a minimum of 100-metres from existing residents and potential future residential developments on adjacent properties as per MECP Design Sewage Guidelines.



Note: This figure is for display purposes only. The exact layout and design of the expansion will be determined during detailed design.

Alternative Design Concepts

Screening of Biosolids Management Processes

Biosolids management strategies for WWTPs typically include some combination of the following processes:

Processes	Description
1. Stabilization	• Stabilization is a process which treats and reduces volume of wastewater residuals with a focus of making a product suitable for land application. • Examples of sludge stabilization include anaerobic/aerobic digestion, lime stabilization, composting, and pelletization. • Due to the quantity of sludge expected to be produced at the proposed facility, biosolids stabilization is not considered a viable management option.
2. Dewatering / Thickening	• Dewatering and thickening are processes which focus on reducing the weight and volume of wastewater residuals. • Examples of dewatering include centrifuges and belt, rotary, or screw presses. • Examples of thickening include gravity belt thickeners, and rotary drum thickeners.
3. Disposal	• Disposal is a necessary step of a biosolids management strategy and may include incineration, re-sale or giveaway, landfilling, and farmland application

Two biosolids management strategies will be carried forward for detailed evaluation:

Alternative 1: Construct Dewatering Facility On-site → Truck Dewatered Sludge to Landfill

Alternative 2: Truck Liquid Sludge to Essex PCP for Dewatering → Truck Dewatered Sludge to Landfill

Alternative Design Concepts

Evaluation of Biosolids Management Strategies

- Poor
- Fair
- Good
- Very Good

	Alternative 1 Dewatering On-site & Disposal at Landfill	Alternative 2 Dewatering at Essex PCP & Disposal at Landfill
Technical Suitability	• More complex O&M requirements • Construction required • Volume is reduced prior to trucking resulting in less frequent loads to the landfill	• Less complex O&M requirements • Construction not required • Volume is not reduced prior to trucking resulting in more frequent loads to the Essex PCP • Capacity at the Essex PCP appears to be sufficient to accept addition sludge from the Colchester WWTP
Social & Natural Environment	• Higher footprint required for the Colchester WWTP • Less frequent truck loads • Minimal odour potential • Minimal noise and vibration potential	• Minimal footprint required at the Colchester WWTP • More frequent truck loads • Minimal odour potential • Negligible noise and vibration potential
Economic	• High O&M costs at the Colchester WWTP • Low O&M cost related to trucking • High capital cost	• Moderate increase to O&M costs at the Essex PCP • Moderate to low O&M cost related to trucking • Minimal capital cost
Overall	Fair	Good

Trucking LRPCP liquid sludge to the Essex PCP appears to be preferred due to lower footprint requirements at the Colchester South WWTP as well as lower capital cost. Construction of an on-site dewatering facility should be reconsidered when major upgrades are being considered at either wastewater treatment facility.

Next Steps

- Review and consider public inputs from this Public Information Centre to determine the preferred design
- Distribute Draft Environmental Study Report (ESR) to public and review agencies
- Finalize ESR with inputs from public and review agencies upon Council approval
- Place ESR on public record and issue Notice of Completion

Thank You

Please visit the Town of Essex's project website to submit a feedback form.

https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

APPENDIX D

Email Packages to Review Agencies

1. Email Package – Notice of Commencement
2. Email Package – Notice of Public Information Centre No.1
3. Email Package – Notice of Public Information Centre No.2
4. Email Package – Notice of Draft ESR
5. Contact List

From: Rindlisbacher, Hannah
To: [redacted]
Subject: 165620266: Notice of Study Commencement - Class EA Colchester South Sewage Works Expansion, Town of Essex
Date: Monday, August 15, 2022 4:34:00 PM
Attachments: 165620266 Notice of Study Commencement.pdf

Dear [redacted],

The Town of Essex is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to accommodate increasing wastewater servicing demands due to significant development pressures within the Colchester South community. This study will satisfy the planning and design process for 'Schedule C' projects which will involve the identification and description of the problem or opportunity, the evaluation of alternative solutions and design concepts for the expansion of the existing Colchester South Sewage Works. A copy of the Notice of Study Commencement for the project is attached.

On behalf of the Town of Essex, we are inviting you to participate in this project and to assist us in identifying the environmental, social, and cultural values your community may have within the Project Area. A reply by September 16th, 2022, would be appreciated so that we may consider your comments early in this study stage.

If you have any comments or concerns regarding this project and wish to provide input into the Study, please contact the undersigned below or one of the individuals named in the attached Notice of Commencement.

Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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Please consider the environment before printing this email.

From:	Rindlisbacher, Hannah
To:	[redacted]
Subject:	165620266: Notice of Public Information Centre - Class EA Colchester South Sewage Works Expansion, Town of Essex
Date:	Monday, October 17, 2022 5:04:00 PM
Attachments:	1. Notice of Public Information Centre.pdf 2. Public Open House Feedback Form.pdf

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Dear [redacted],

The Town of Essex is undertaking the Class Environmental Assessment (EA) process for the expansion of the existing Colchester South sewage works to accommodate increasing wastewater servicing demands due to new development pressures. This Class EA will involve public and review agency consultation, an evaluation of alternatives, an assessment of the potential environmental effects of the proposed works, and identification of reasonable measures to mitigate any adverse impacts that may result.

The Town is hosting a Public Information Centre (PIC) to present the evaluation of alternative solutions and receive input from interested residents and stakeholders. The PIC will be held on Wednesday October 26th, 2022 (4:00 to 7:00 pm) at the Colchester Community Centre, 100 Jackson Street, Harrow, ON. A copy of the Notice of Public Information Centre for the project is attached and additional information regarding the project is available on the Town's Webpage: https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

If you have any comments or concerns regarding this project, please contact the undersigned.

Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

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Please consider the environment before printing this email.

From: Rindlisbacher, Hannah
To: [redacted]
Subject: 165620266: Notice of Public Information Centre No.2 - Class EA Colchester South Sewage Works Expansion, Town of Essex
Date: Thursday, March 9, 2023 12:32:00 PM
Attachments: 1. Notice of Public Information Centre No.2.pdf
2. Public Open House No.2 Feedback Form.pdf

Dear [redacted],

The Town of Essex is undertaking a Schedule 'C' Municipal Class Environmental Assessment (EA) process for the expansion of the existing Colchester South sewage works. This study will satisfy Phases 1, 2, 3 and 4 of the Class EA process which will involve public and review agency consultation, an evaluation of alternatives, an assessment of the potential environmental effects of the proposed works, and identification of reasonable measures to mitigate any adverse impacts that may result. An Environmental Study Report will be prepared to document the activities and recommendations from the Class EA process.

The Town is hosting a second Public Information Centre (PIC) to present the evaluation of alternative design concepts to upgrade the existing Colchester South Sewage Works and expand the original service area. The PIC will be held on March 22nd, 2023 (4:00 to 7:00pm) at the Colchester Community Centre, 100 Jackson Street, Harrow ON to receive inputs from interested residents and stakeholders. A copy of the Notice of Public Information Centre for the project is attached and additional information regarding the project is available on the Town's Webpage: https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

If you have any comments or concerns regarding this project, please contact the undersigned.

Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T., LEED Green Associate
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

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From: Rindlisbacher, Hannah
To: [redacted]
Subject: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report
Date: Tuesday, May 30, 2023 1:51:00 PM

To Whom It May Concern,

The Town of Essex initiated a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the expansion of the existing Colchester South Sewage Works to accommodate ongoing and future development within the community. This study will satisfy Phases 1, 2, 3 and 4 of the Class EA process which will involve the evaluation of alternative solutions and design concepts, and selection of the preferred design for the proposed Colchester South Sewage Works Expansion. This "Draft" Environmental Study Report was prepared to document the activities and recommendations from the Class EA process.

The Town is looking for comments and feedback on the "Draft" Environmental Study Report from review agencies and Indigenous communities. In an effort to conserve paper and reduce printing costs, the report is being distributed in electronic format.

Please visit the following link and login information to access the report:

Login Information

FTP link: https://tmpsftp.stantec.com
Login name: s0606110854
Password: 8974393
Disk Quota: 20 GB
Expiry Date: 6/13/2023

Additional project details are available on the Town's project webpage: Colchester South Sewage Works Expansion - Town of Essex

If you have any comments or concerns regarding this "Draft" Environmental Study Report, please contact the undersigned. We would appreciate receiving any comments on the draft report by June 16th, 2023.

Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T., LEED Green Associate
Process Engineer in Training

Direct: 226-704-3060
Direct: 519-966-2250 ext
hannah.rindlisbacher@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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Please consider the environment before printing this email.

Title	Surname	First Name	Organization	Department	Job Title	Address	City/Prov	Postal Code	Tel.	Fax	E-Mail
Local Municipalities											
Ms.	Habiba	Sumaiya	County of Essex		Environmental Coordinator	360 Fairview Avenue West	Essex, Ontario	N8M 1Y6	519-776-6441 ex 1385		SHabiba@countyofessex.ca
Mr.	Girard	Kevin	Town of Essex		Director of Infrastructure Services	33 Talbot Street South	Essex, Ontario	N8M 1A8	519-776-7336 ext 1119		kgirard@essex.ca
Mr.	Marra	Peter	Town of LaSalle		Deputy Chief Administrative Officer	5950 Malden Road	LaSalle, Ontario	N9H 1S4	519-969-7770		pmarra@lasalle.ca
Ms.	Belleau	Shannon	Municipality of Leamington		Manager of Environmental Services	111 Erie St N	Leamington ON	N8H 279	519-326-5761 x1650		sbelleau@leamington.ca
Ms.	Kalbol	Krystal	Municipality of Lakeshore		Corporate Leader - Operations	419 Notre Dame Street	Belle River, ON	N0R 1A0	519-728-2488 x655		kkalbol@lakeshore.ca
Mr.	Nepszy	Chris	City of Windsor		City Engineer	350 City Hall Square West	Windsor, ON	N9A 6S1			cnepszy@citywindsor.ca
Mr.	Del Greco	Tim	Town of Kingsville		Manager of Engineering	2021 Division Rd North	Kingsville, ON	N9Y2Y9			tdelgreco@kingsville.ca
Mr.	Bartnik	Phil	Town of Tecumseh		Director Public Works & Engineering Services	917 Lesperance Road	Tecumseh, ON	N8N 1W9	519-735-2184		pbartnik@tecumseh.ca
Ms.	Giofu	Antonietta	Town of Amherstburg		Director of Engineering & Public Works	271 Sandwich Street South	Amherstburg, ON	N9V 2A5	519-736-0012		agiofu@amherstburg.ca
Conservation Authority											
(ERCA) Please send all Class EA study correspondence to the Planning inbox in the future, including Notices of Study Commencements, PICs, Completions, etc.											planning@erca.org
Mr.	Martin	Tian	Essex Region Conservation Authority		Water Resources Engineer						tmartin@erca.org
Emergency Services											
	***		Ontario Provincial Police	Operations Manager		1219 Hicks Road, PO Box 910	Essex, ON	N8M 2Y2	519-723-2491	519-723-2492	OPP.Essex@opp.ca
Interest Groups											
Ms.	Byrne	Emelda	Windsor-Essex Catholic School Board		Director of Education	1325 California Avenue	Windsor, ON	N9B 1Y8	519-253-2481 x 1201	519-253-8397	director@wecdsb.on.ca
Ms.	Adams	Meagan	Windsor-Essex Catholic School Board	Facility Services		1325 California Avenue	Windsor, ON	N9B 1Y8	519-253-2481		meagan_adams@wecdsb.on.ca
Ms.	McMillan	Gabrielle	Windsor-Essex Student Transportation Services		General Manager of Student Transportation	360 Fairview Avenue West, Suite 318	Essex, ON	N8M 3G4	519-776-6431 x220	519-776-4457	gabrielle_mcmillan@wecdsb.on.ca
	Pringle	Tracy	Municipal Property Assessment Corporation	Windsor-Essex Assessment Office		1695 Manning Road, Unit 195	Tecumseh, ON	N8N 2L9			Tracy.Pringle@mpac.ca
Mr.	Naidu	Rakesh	Windsor-Essex Regional Chamber of Commerce		President & CEO	2575 Ouellette Place	Windsor, ON	N8X 1L9	519-966-3696 x222		rnaidu@windsoressexchamber.org
	Li	Wing On	Horizons Group Subsidiaries		CHIEF EXECUTIVE OFFICER/DIRECTOR	4510 Rhodes Drive, Suite 520	Windsor, ON	N8W 5K5	(647) 866-1200		wingon.li@horizoninv.ca
	Edmunds	Kyle	Dillon Consulting								kedmunds@dillon.ca

Title	Surname	First Name	Organization	Department	Job Title	Address	City/Prov	Postal Code	Tel.	Fax	E-Mail
Provincial Agencies											
Ms.	Barboza	Karla	Ministry of Tourism, Culture and Sport	Heritage Planning Unit	Heritage Team Lead	401 Bay Street, Suite 1700	Toronto, ON	M7A 0A7	416-314-7120		karla.barboza@ontario.ca
Mr.	Winger	Darren	Ministry of Citizenship, Immigration & International Trade / Ministry of Tourism, Culture & Sport	Windsor Office	Regional Development Advisor	221 Mill Street	Windsor, ON	N9C 2R1	519-973-1445	519-973-1414	darren.winger@ontario.ca
	Badali	Mark	Ministry of the Environment, Conservation and Parks	Project Review Unit | Environmental Assessment Branch	Regional Environmental Planner (REP) – Southwest Region				(416) 457-2155		Mark.Badali1@ontario.ca
			MECP Regional Email address								eanotification.swregion@ontario.ca
	Kerr	Ian	Ministry of Municipal Affairs and Housing	Municipal Services Office - Western Ontario Region	Regional Director	659 Exeter Road, 2nd Floor	London, ON	N6E 1L3	519-873-4026		ian.kerr@ontario.ca
	Boyd	Erick	Ministry of Municipal Affairs and Housing	Community Planning and Development	Manager	659 Exeter Road, 2nd Floor	London, ON	N6E 1L3	519-873-4025		erick.boyd@ontario.ca
	Cotnam	Erin	Ministry of Northern Development, Mines, Natural Resources and Forestry (NRF)		Municipal Planning Advisor, Land Use Planning and Strategic Issues Section	4th Flr S, 300 Water St,	Peterborough, ON	K9J 3C7	705-313-4719		erin.cotnam@ontario.ca
	Quigley	Iain	Ministry of Northern Development, Mines, Natural Resources and Forestry (NRF)		Regional Lands Intern				705-772-9310		Iain.Quigley@ontario.ca
Mr.	Mitchell	James	Ontario Ministy of Agriculture, Food and Rural Affairs		Director of Environmental Management Branch						james.mitchell@Ontario.ca
Mr.	Carlow	Dan	Ontario Ministy of Agriculture, Food and Rural Affairs		Manager of Innovation, Engineering and Program Delivery, Western Region	581 Huron St,	Stratford, ON	N5A 5T8			dan.carlow@ontario.ca
Mr.	Brunke	Richard	Ontario Ministy of Agriculture, Food and Rural Affairs		Nutrient Management Engineer	581 Huron St,	Stratford, ON	N5A 5T8			richard.brunke@ontario.ca
Federal Agencies											
Ms.	Eddy	Sara	Fisheries and Oceans Canada - Central and Arctic Region	Fisheries Protection Program	Fish Habitat Biologist	867 Lakeshore Road, PO Box 5050	Burlington, ON	L7R 4A6	(905) 336-4535	(905) 336-4447	Sara.Eddy@dfo-mpo.gc.ca
	General		Environment and Climate Change Canada								ec.enviroinfo.ec@canada.ca
Ms.	Knox	Louise	Environment Canada	Canadian Environmental Assessment Agency - Ontario Region	Regional Director	55 St Clair Ave East, 9th Floor	Toronto, ON	M4T 1M2			louise.knox@ontario.ca
Mr.	Leonardelli	Sandro	Environment Canada, Ontario Region	Environmental Assessment Section	Head				416-739-5858		sandro.leonardelli@ec.gc.ca

Title	Surname	First Name	Organization	Department	Job Title	Address	City/Prov	Postal Code	Tel.	Fax	E-Mail
Utilities											
Mr.	Trepanier	Clifford	Bell Canada			1149 Goyeau Street, PO Box 1601	Windsor, ON	N9A 1H9			clifford.trepanier@bell.ca
Mr.	Fuerth	Tyson	Bell Canada			1149 Goyeau Street, PO Box 1601	Windsor, ON	N9A 1H9	519-973-4711		tyson.fuerth@bell.ca
Mr.	Sorrell	Bill	Cogeco Cable Services			2225 Dougall Avenue	Windsor, ON	N8X 5A7	519-972-4023	519-972-6688	bill.sorrell@cogeco.com
Mr.	Clavet	Anthony	Essex Power Corporation	Essex Power Corporation	Director of Engineering	2199 Blackacre Drive Suite 2	Oldcastle, ON	N0R 1L0			aclavet@essexpowerlines.ca
Mr.	Jubenville	Dave	Ontario Clean Water Agency	Ontario Clean Water Agency	Regional Manager	276 Rourke Line Road RR#3	Belle River, Ontario	N0R 1A0			djubenville@ocwa.com
	Burgess	Karen	Ontario Clean Water Agency	Ontario Clean Water Agency							kburgess@ocwa.com

APPENDIX D

Mailout Packages to Local Residents

1. Mailout Package – Notice of Phase 2 Consultation
2. Mailout Package – Notice of Public Information Centre No.2

November 8, 2022

Project: 165620266

Dear Resident,

Reference: Phase 2 Public Consultation,
Class Environmental Assessment –
Colchester South Sewage Works Expansion, Town of Essex

The Town of Essex is undertaking a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the expansion of the existing Colchester South sewage works. This study will satisfy Phases 1, 2, 3 and 4 of the Class EA process which will involve public and review agency consultation, an evaluation of alternatives, an assessment of the potential environmental effects of the proposed works, and identification of reasonable measures to mitigate any adverse impacts that may result. An Environmental Study Report will be prepared to document the activities and recommendations from the Class EA process.

We are currently in Phase 2 and collecting input from the public and review agencies in order to determine the preferred solution. Phase 2 consists of identification of alternative solutions to the problem, consultation with review agencies and the public, selection of the preferred solution.

As part of the Phase 2 public consultation process, the Town is looking for comments and feedback from local residents in the surrounding area of the existing Colchester South Lagoons. Information such as the Notice of Commencement, Public Information Centre slideshow and the feedback form can be found on the project webpage at: https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

For further information, please contact:

David McBeth, C.E.T.
Manager, Capital Works and Asset Management
519-776-7336 ext. 1113
dmcbeth@essex.ca

Jian Li, Ph.D., P. Eng.
Project Manager, Stantec Consulting
519-966-2250 ext. 240
jian.li@stantec.com

Comments are welcomed and will be accepted until November 30th, 2022.

Sincerely,



_____

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training
Phone: (519) 966-2250
Mobile: 226-268-3033
hannah.rindlisbacher@stantec.com

PUBLIC INFORMATION CENTRE
COMMENT FORM

COLCHESTER SOUTH SEWAGE WORKS EXPANSION

The southern portion, or Urban Area, of Colchester South Community of the Town of Essex is serviced with a communal sewage system. Wastewater within this service area is collected by sanitary sewer systems and then conveyed to the existing Colchester South wastewater treatment facility for treatment. The Town has been realizing increasing wastewater servicing demands from significant development pressures within the community area. To ascertain this impact, the Town has initiated a Class Environmental Assessment (Class EA) to expand the existing Colchester South Sewage Works.

This study will include an opportunity and problem statement, evaluation of alternative solutions, evaluation of alternative design concepts, and recommendations for the preferred design. This assessment will include consideration for potential environmental, social, and economic impacts as well as measures to mitigate adverse impacts.

THANK YOU

Public participation will form an integral part of this Class EA study to ensure that the concerns of the public and affected groups within the study area are identified, documented, and assessed. Thank you for your interest in this project and attendance at this public information centre.

Copies of the Public Information Centre material are available on the Town's project website below:

https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

Please return your completed comment form on or before November 30th, 2022, to:

Hannah Rindlisbacher, E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 226-268-3033
hannah.rindlisbacher@stantec.com

Attention: Hannah Rindlisbacher
Stantec Consulting Ltd.
2555 Ouellette Avenue, Unit 100
Windsor ON
N8X 1L9

Stantec

COLCHESTER SOUTH SEWAGE WORKS EXPANSION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the Colchester South Sewage Works Expansion:

NAME _____

EMAIL ADDRESS _____

TELEPHONE NO. ( ) _____

DATE_____SIGNATURE _____

Stantec

Personal information submitted is collected, maintained, and disclosed under the authority of the *Environmental Assessment Act and the Municipal Freedom of Information and Protection of Privacy Act* for transparency and consultation purposes. Personal information you submit will become part of a public record that is available to the general public, unless you request that your personal information remain confidential.

Stantec Consulting Ltd.
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

March 8th, 2023

Project: 165620266

Dear Resident,

Reference: Notice of Public Information Centre No.2,
Class Environmental Assessment –
Colchester South Sewage Works Expansion, Town of Essex

The Town of Essex is undertaking a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the expansion of the existing Colchester South sewage works. This study will satisfy Phases 1, 2, 3 and 4 of the Class EA process which will involve public and review agency consultation, an evaluation of alternatives, an assessment of the potential environmental effects of the proposed works, and identification of reasonable measures to mitigate any adverse impacts that may result. An Environmental Study Report will be prepared to document the activities and recommendations from the Class EA process.

The Town is hosting a second Public Information Centre (PIC) to present the evaluation of alternative design concepts for the Colchester South Sewage Works Expansion to upgrade the existing Colchester South Sewage Works and expand the original service area and receive inputs from local residents and stakeholders. The PIC will be held on March 22nd, 2023 (4:00 to 7:00pm) at the Colchester Community Centre, 100 Jackson Street, Harrow ON. A copy of the Notice of Public Information Centre No.2 and a feedback form for the project is attached.

Please contact the undersigned with any comments or concerns regarding this project.

Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training
Phone: (519) 966-2250 x 258
Mobile: 226-268-3033
hannah.rindlisbacher@stantec.com

Attachment: Notice of Public Information Centre No.2, Feedback Form

COLCHESTER SOUTH SEWAGE WORKS EXPANSION
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE

The Town of Essex is undertaking a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the expansion of the existing Colchester South sewage works to accommodate ongoing and future development within the community. This study will satisfy Phases 1, 2, 3 and 4 of the Class EA process which will involve public and review agency consultation, an evaluation of alternatives, an assessment of the potential environmental effects of the proposed works, and identification of reasonable measures to mitigate any adverse impacts that may result. An Environmental Study Report will be prepared to document the activities and recommendations from the Class EA process.

The Town is hosting a second Public Information Centre (PIC) to present the evaluation of alternative design concepts to upgrade the existing Colchester South Sewage Works and expand the original service area. Consultation is an integral part of the EA process and members of the public, agencies, and other interested persons are invited to participate in the upcoming PIC.

PUBLIC INFORMATION CENTRE NO.2
Wednesday March 22nd, 2023
4:00 p.m. – 7:00 p.m.
Colchester Community Centre
100 Jackson St, Harrow, ON

Information regarding this PIC can be found on the Town's project website starting from March 22, 2023: https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

Following the PIC, comments are welcomed and will be received until April 30th, 2023.

For further information, please contact:

David McBeth, C.E.T.
Manager, Capital Works and Asset Management
519-776-7336 ext. 1113
dmcbeth@essex.ca

Jian Li, Ph.D., P. Eng.
Project Manager, Stantec Consulting
519-966-2250 ext. 240
jian.li@stantec.com

Personal information submitted is collected, maintained, and disclosed under the authority of the *Environmental Assessment Act and the Municipal Freedom of Information and Protection of Privacy Act* for transparency and consultation purposes. Personal information you submit will become part of a public record that is available to the general public, unless you request that your personal information remain confidential.

PUBLIC INFORMATION CENTRE NO.2
COMMENT FORM

COLCHESTER SOUTH SEWAGE WORKS EXPANSION

The southern portion, or Urban Area, of Colchester South Community of the Town of Essex is serviced with a communal sewage system. Wastewater within this service area is collected by sanitary sewer systems and then conveyed to the existing Colchester South wastewater treatment facility for treatment. The Town has been realizing increasing wastewater servicing demands from significant development pressures within the community area. To ascertain this impact, the Town has initiated a Class Environmental Assessment (Class EA) to upgrade the existing Colchester South Sewage Works and expand the original service area.

This study will include an opportunity and problem statement, evaluation of alternative solutions, evaluation of alternative design concepts, and recommendations for the preferred design. This assessment will include consideration for potential environmental, social, and economic impacts as well as measures to mitigate adverse impacts.

THANK YOU

Public participation will form an integral part of this Class EA study to ensure that the concerns of the public and affected groups within the study area are identified, documented, and assessed. Thank you for your interest in this project and attendance at this public information centre.

Copies of the Public Information Centre No.2 material are available on the Town's project website below:

https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

Please return your completed comment form on or before April 30th, 2023, to:

Hannah Rindlisbacher, E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 226-268-3033
hannah.rindlisbacher@stantec.com

Attention: Hannah Rindlisbacher
Stantec Consulting Ltd.
2555 Ouellette Avenue, Unit 100
Windsor ON
N8X 1L9

Stantec

COLCHESTER SOUTH SEWAGE WORKS EXPANSION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the Colchester South Sewage Works Expansion:

NAME _____

EMAIL ADDRESS _____

TELEPHONE NO. ( ) _____

DATE _____ SIGNATURE _____

Stantec

Personal information submitted is collected, maintained, and disclosed under the authority of the *Environmental Assessment Act and the Municipal Freedom of Information and Protection of Privacy Act* for transparency and consultation purposes. Personal information you submit will become part of a public record that is available to the general public, unless you request that your personal information remain confidential.

APPENDIX D

Response from Review Agencies – Notice of Project Commencement

Ministry of the Environment, Conservation and Parks

Environmental Assessment Branch

1st Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax.: 416 314-8452

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction des évaluations environnementales

Rez-de-chaussée
135, avenue St. Clair Ouest
Toronto ON M4V 1P5
Tél. : 416 314-8001
Téléc. : 416 314-8452

September 6, 2022

David McBeth
Manager, Capital Works and Asset Management
Town of Essex
dmcbeth@essex.ca

BY EMAIL ONLY

Re: **Colchester South Sewage Works Expansion**
Town of Essex
Municipal Class Environmental Assessment, Schedule C
Acknowledgement of Notice of Commencement

Dear David McBeth,

This letter is in response to the Notice of Commencement for the above noted project. The Ministry of the Environment, Conservation and Parks (MECP) acknowledges that the Town of Essex (proponent) has indicated that the study is following the approved environmental planning process for a Schedule C project under the Municipal Class Environmental Assessment (Class EA).

The **updated (August 2022)** attached "Areas of Interest" document provides guidance regarding the ministry's interests with respect to the Class EA process. Please address all areas of interest in the EA documentation at an appropriate level for the EA study. Proponents who address all the applicable areas of interest can minimize potential delays to the project schedule. **Further information is provided at the end of the Areas of Interest document relating to recent changes to the Environmental Assessment Act through Bill 197, Covid-19 Economic Recovery Act 2020.**

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

The proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to the proposed project**, the MECP is delegating the procedural aspects of rights-based consultation to the proponent through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information provided to date and the Crown`s preliminary assessment the proponent is required to consult with the following communities who have been identified as potentially affected by the proposed project:

- Aamjiwnaang First Nation
- Bkejwanong (Walpole Island)
- Caldwell First Nation
- Chippewas of Kettle and Stoney Point
- Chippewas of the Thames First Nation
- Oneida Nation of the Thames First Nation

Steps that the proponent may need to take in relation to Aboriginal consultation for the proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process". Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments.

Please also refer to the attached document "A Proponent's Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities" for further information, including the MECP's expectations for EA report documentation related to consultation with communities.

The proponent must contact the Director of Environmental Assessment Branch (EABDirector@ontario.ca) under the following circumstances after initial discussions with the communities identified by the MECP:

- Aboriginal or treaty rights impacts are identified to you by the communities;
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right;

- Consultation with Indigenous communities or other stakeholders has reached an impasse; or
- A Section 16 Order request is expected based on impacts to Aboriginal or treaty rights

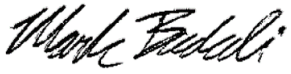
The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play should additional steps and activities be required.

A draft copy of the report should be sent directly to me prior to the filing of the final report, allowing a minimum of 30 days for the ministry's technical reviewers to provide comments.

Please also ensure a copy of the final notice is sent to the ministry's Southwest Region EA notification email account (eanotification.swregion@ontario.ca) after the draft report is reviewed and finalized.

Should you or any members of your project team have any questions regarding the material above, please contact me at mark.badali1@ontario.ca.

Sincerely,



Mark Badali
Regional Environmental Planner – Southwest Region

Cc: Marcelina Wilson, Supervisor, Windsor Area Office, MECP
Marc Bechard, Water Compliance Supervisor, Sarnia District Office, MECP
Jian Li, Project Manager, Stantec Consulting Ltd.
Hannah Rindlisbacher, Environmental Engineer in Training, Stantec Consulting Ltd.

Enclosed: Areas of Interest

Attached: Client's Guide to Preliminary Screening for Species at Risk

A Proponent's Introduction to the Delegation of Procedural Aspects of Consultation with Aboriginal Communities

AREAS OF INTEREST (v. August 2022)

It is suggested that you check off each section after you have considered / addressed it.

☐ **Planning and Policy**

- Applicable plans and policies should be identified in the report, and the proponent should describe how the proposed project adheres to the relevant policies in these plans.
    - Projects located in MECP Central, Eastern or West Central Region may be subject to **A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020)**.
    - Projects located in MECP Central or Eastern Region may be subject to the **Oak Ridges Moraine Conservation Plan (2017)** or the **Lake Simcoe Protection Plan (2014)**.
    - Projects located in MECP Central, Southwest or West Central Region may be subject to the **Niagara Escarpment Plan (2017)**.
    - Projects located in MECP Central, Eastern, Southwest or West Central Region may be subject to the **Greenbelt Plan (2017)**.
    - Projects located in MECP Northern Region may be subject to the **Growth Plan for Northern Ontario (2011).**

- The **Provincial Policy Statement (2020)** contains policies that protect Ontario's natural heritage and water resources. Applicable policies should be referenced in the report, and the proponent should describe how the proposed project is consistent with these policies.

- In addition to the provincial planning and policy level, the report should also discuss the planning context at the municipal and federal levels, as appropriate.

☐ **Source Water Protection**

The *Clean Water Act*, 2006 (CWA) aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs) and surface water Intake Protection Zones (IPZs). Other vulnerable areas that have been delineated under the CWA include Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), Event-based modelling areas (EBAs), and Issues Contributing Areas (ICAs). Source protection plans have been developed that include policies to address existing and future risks to sources of municipal drinking water within these vulnerable areas.

Projects that are subject to the Environmental Assessment Act that fall under a Class EA, or one of the Regulations, have the potential to impact sources of drinking water if they occur in designated vulnerable areas or in the vicinity of other at-risk drinking water systems (i.e.

systems that are not municipal residential systems). MEA Class EA projects may include activities that, if located in a vulnerable area, could be a threat to sources of drinking water (i.e. have the potential to adversely affect the quality or quantity of drinking water sources) and the activity could therefore be subject to policies in a source protection plan. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how or where that activity is undertaken. Policies may prohibit certain activities, or they may require risk management measures for these activities. Municipal Official Plans, planning decisions, Class EA projects (where the project includes an activity that is a threat to drinking water) and prescribed instruments must conform with policies that address significant risks to drinking water and must have regard for policies that address moderate or low risks.

- In October 2015, the MEA Parent Class EA document was amended to include reference to the Clean Water Act (Section A.2.10.6) and indicates that proponents undertaking a Municipal Class EA project must identify early in their process whether a project is or could potentially be occurring with a vulnerable area. **Given this requirement, please include a section in the report on source water protection.**

    - The proponent should identify the source protection area and should clearly document how the proximity of the project to sources of drinking water (municipal or other) and any delineated vulnerable areas was considered and assessed. Specifically, the report should discuss whether or not the project is located in a vulnerable area and provide applicable details about the area.

    - If located in a vulnerable area, proponents should document whether any project activities are prescribed drinking water threats and thus pose a risk to drinking water (this should be consulted on with the appropriate Source Protection Authority). Where an activity poses a risk to drinking water, the proponent must document and discuss in the report how the project adheres to or has regard to applicable policies in the local source protection plan. This section should then be used to inform and be reflected in other sections of the report, such as the identification of net positive/negative effects of alternatives, mitigation measures, evaluation of alternatives etc.

- While most source protection plans focused on including policies for significant drinking water threats in the WHPAs and IPZs it should be noted that even though source protection plan policies may not apply in HVAs, these are areas where aquifers are sensitive and at risk to impacts and within these areas, activities may impact the quality of sources of drinking water for systems other than municipal residential systems.

- In order to determine if this project is occurring within a vulnerable area, proponents can use Source Protection Information Atlas, which is an online mapping tool available to the public. Note that various layers (including WHPAs, WHPA-Q1 and WHPA-Q2, IPZs, HVAs, SGRAs, EBAs, ICAs) can be turned on through the “Map Legend” bar on the left. The

mapping tool will also provide a link to the appropriate source protection plan in order to identify what policies may be applicable in the vulnerable area.

- For further information on the maps or source protection plan policies which may relate to their project, proponents must contact the appropriate source protection authority. **Please consult with the local source protection authority to discuss potential impacts on drinking water. Please document the results of that consultation within the report and include all communication documents/correspondence.**

More Information

For more information on the *Clean Water Act*, source protection areas and plans, including specific information on the vulnerable areas and drinking water threats, please refer to Conservation Ontario's website where you will also find links to the local source protection plan/assessment report.

A list of the prescribed drinking water threats can be found in section 1.1 of Ontario Regulation 287/07 made under the *Clean Water Act*. In addition to prescribed drinking water threats, some source protection plans may include policies to address additional "local" threat activities, as approved by the MECP.

☐ **Climate Change**

The document "Considering Climate Change in the Environmental Assessment Process" (Guide) is now a part of the Environmental Assessment program's Guides and Codes of Practice. The Guide sets out the MECP's expectation for considering climate change in the preparation, execution and documentation of environmental assessment studies and processes. The guide provides examples, approaches, resources, and references to assist proponents with consideration of climate change in EA. Proponents should review this Guide in detail.

- **The MECP expects proponents of Class EA projects to:**

1. Consider during the assessment of alternative solutions and alternative designs, the following:
    a. the project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and
    b. resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation).
2. Include a discrete section in the report detailing how climate change was considered in the EA.

How climate change is considered can be qualitative or quantitative in nature and should be scaled to the project's level of environmental effect. In all instances, both a project's impacts on climate change (mitigation) and impacts of climate change on a project (adaptation) should be considered.

- The MECP has also prepared another guide to support provincial land use planning direction related to the completion of energy and emission plans. The "Community Emissions Reduction Planning: A Guide for Municipalities" document is designed to educate stakeholders on the municipal opportunities to reduce energy and greenhouse gas emissions, and to provide guidance on methods and techniques to incorporate consideration of energy and greenhouse gas emissions into municipal activities of all types. We encourage you to review the Guide for information.

Air Quality, Dust and Noise

- If there are sensitive receptors in the surrounding area of this project, a quantitative air quality/odour impact assessment will be useful to evaluate alternatives, determine impacts and identify appropriate mitigation measures. The scope of the assessment can be determined based on the potential effects of the proposed alternatives, and typically includes source and receptor characterization and a quantification of local air quality impacts on the sensitive receptors and the environment in the study area. The assessment will compare to all applicable standards or guidelines for all contaminants of concern. **Please contact this office for further consultation on the level of Air Quality Impact Assessment required for this project if not already advised.**

- If a quantitative Air Quality Impact Assessment is not required for the project, the MECP expects that the report contain a qualitative assessment which includes:

    - A discussion of local air quality including existing activities/sources that significantly impact local air quality and how the project may impact existing conditions;
    - A discussion of the nearby sensitive receptors and the project's potential air quality impacts on present and future sensitive receptors;
    - A discussion of local air quality impacts that could arise from this project during both construction and operation; and
    - A discussion of potential mitigation measures.

- As a common practice, "air quality" should be used an evaluation criterion for all road projects.

- Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the study area are not adversely affected during construction activities.

- The MECP recommends that non-chloride dust-suppressants be applied. For a comprehensive list of fugitive dust prevention and control measures that could be applied, refer to *Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from*

Construction and Demolition Activities report prepared for Environment Canada. March 2005.

- The report should consider the potential impacts of increased noise levels during the operation of the completed project. The proponent should explore all potential measures to mitigate significant noise impacts during the assessment of alternatives.

Ecosystem Protection and Restoration

- Any impacts to ecosystem form and function must be avoided where possible. The report should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.

- Natural heritage and hydrologic features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. The following sensitive environmental features may be located within or adjacent to the study area:
  - Key Natural Heritage Features: Habitat of endangered species and threatened species, fish habitat, wetlands, areas of natural and scientific interest (ANSIs), significant valleylands, significant woodlands; significant wildlife habitat (including habitat of special concern species); sand barrens, savannahs, and tallgrass prairies; and alvars.
  - Key Hydrologic Features: Permanent streams, intermittent streams, inland lakes and their littoral zones, seepage areas and springs, and wetlands.
  - Other natural heritage features and areas such as: vegetation communities, rare species of flora or fauna, Environmentally Sensitive Areas, Environmentally Sensitive Policy Areas, federal and provincial parks and conservation reserves, Greenland systems etc.

We recommend consulting with the Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and your local conservation authority to determine if special measures or additional studies will be necessary to preserve and protect these sensitive features. In addition, for projects located in Central Region you may consider the provisions of the Rouge Park Management Plan if applicable.

Species at Risk

- The Ministry of the Environment, Conservation and Parks has now assumed responsibility of Ontario's Species at Risk program. Information, standards, guidelines, reference materials and technical resources to assist you are found at https://www.ontario.ca/page/species-risk.

- The Client's Guide to Preliminary Screening for Species at Risk (Draft May 2019) has been attached to the covering email for your reference and use. Please review this document for next steps.

- For any questions related to subsequent permit requirements, please contact SAROntario@ontario.ca.

Surface Water

- The report must include enough information to demonstrate that there will be no negative impacts on the natural features or ecological functions of any watercourses within the study area. Measures should be included in the planning and design process to ensure that any impacts to watercourses from construction or operational activities (e.g. spills, erosion, pollution) are mitigated as part of the proposed undertaking.

- Additional stormwater runoff from new pavement can impact receiving watercourses and flood conditions. Quality and quantity control measures to treat stormwater runoff should be considered for all new impervious areas and, where possible, existing surfaces. The ministry's Stormwater Management Planning and Design Manual (2003) should be referenced in the report and utilized when designing stormwater control methods. **A Stormwater Management Plan should be prepared as part of the Class EA process** that includes:

    - Strategies to address potential water quantity and erosion impacts related to stormwater draining into streams or other sensitive environmental features, and to ensure that adequate (enhanced) water quality is maintained
    - Watershed information, drainage conditions, and other relevant background information
    - Future drainage conditions, stormwater management options, information on erosion and sediment control during construction, and other details of the proposed works
    - Information on maintenance and monitoring commitments.

- Ontario Regulation 60/08 under the *Ontario Water Resources Act* (OWRA) applies to the Lake Simcoe Basin, which encompasses Lake Simcoe and the lands from which surface water drains into Lake Simcoe. If the proposed sewage treatment plant is listed in Table 1 of the regulation, the report should describe how the proposed project and its mitigation measures are consistent with the requirements of this regulation and the OWRA.

- Any potential approval requirements for surface water taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, except for certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please

review the Water Taking User Guide for EASR for more information. Additionally, an Environmental Compliance Approval under the OWRA is required for municipal stormwater management works.

Groundwater

- The status of, and potential impacts to any well water supplies should be addressed. If the project involves groundwater takings or changes to drainage patterns, the quantity and quality of groundwater may be affected due to drawdown effects or the redirection of existing contamination flows. In addition, project activities may infringe on existing wells such that they must be reconstructed or sealed and abandoned. Appropriate information to define existing groundwater conditions should be included in the report.

- If the potential construction or decommissioning of water wells is identified as an issue, the report should refer to Ontario Regulation 903, Wells, under the OWRA.

- Potential impacts to groundwater-dependent natural features should be addressed. Any changes to groundwater flow or quality from groundwater taking may interfere with the ecological processes of streams, wetlands or other surficial features. In addition, discharging contaminated or high volumes of groundwater to these features may have direct impacts on their function. Any potential effects should be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.

- Any potential approval requirements for groundwater taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, with the exception of certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the Water Taking User Guide for EASR for more information.

- Consultation with the railroad authorities is necessary wherever there is a plan to use construction dewatering in the vicinity of railroad lines or where the zone of influence of the construction dewatering potentially intercepts railroad lines.

Excess Materials Management

- In December 2019, MECP released a new regulation under the Environmental Protection Act, titled "On-Site and Excess Soil Management" (O. Reg. 406/19) to support improved management of excess construction soil. This regulation is a key step to support proper management of excess soils, ensuring valuable resources don't go to waste and to provide

clear rules on managing and reusing excess soil. New risk-based standards referenced by this regulation help to facilitate local beneficial reuse which in turn will reduce greenhouse gas emissions from soil transportation, while ensuring strong protection of human health and the environment. The new regulation is being phased in over time, with the first phase in effect on January 1, 2021. For more information, please visit https://www.ontario.ca/page/handling-excess-soil.

- The report should reference that activities involving the management of excess soil should be completed in accordance with O. Reg. 406/19 and the MECP's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014).

- All waste generated during construction must be disposed of in accordance with ministry requirements

Contaminated Sites

- Any current or historical waste disposal sites should be identified in the report. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the EPA may be required for land uses on former disposal sites. We recommend referring to the MECP's D-4 guideline for land use considerations near landfills and dumps.
    - Resources available may include regional/local municipal official plans and data; provincial data on large landfill sites and small landfill sites; Environmental Compliance Approval information for waste disposal sites on Access Environment.

- Other known contaminated sites (local, provincial, federal) in the study area should also be identified in the report (Note – information on federal contaminated sites is found on the Government of Canada's website).

- The location of any underground storage tanks should be investigated in the report. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The ministry's Spills Action Centre must be contacted in such an event.

- Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with *Part XV.1 of the Environmental Protection Act* (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up. Please contact the appropriate MECP District Office for further consultation if contaminated sites are present.

Servicing, Utilities and Facilities

- The report should identify any above or underground utilities in the study area such as transmission lines, telephone/internet, oil/gas etc. The owners should be consulted to discuss impacts to this infrastructure, including potential spills.

- The report should identify any servicing infrastructure in the study area such as wastewater, water, stormwater that may potentially be impacted by the project.

- Any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste must have an Environmental Compliance Approval (ECA) before it can operate lawfully. Please consult with MECP's Environmental Permissions Branch to determine whether a new or amended ECA will be required for any proposed infrastructure.

- We recommend referring to the ministry's environmental land use planning guides to ensure that any potential land use conflicts are considered when planning for any infrastructure or facilities related to wastewater, pipelines, landfills or industrial uses.

Mitigation and Monitoring

- Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for both construction and operation are met. Mitigation measures should be clearly referenced in the report and regularly monitored during the construction stage of the project. In addition, we encourage proponents to conduct post-construction monitoring to ensure all mitigation measures have been effective and are functioning properly.

- Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.

- The proponent's construction and post-construction monitoring plans must be documented in the report, as outlined in Section A.2.5 and A.4.1 of the MEA Class EA parent document.

Consultation

- The report must demonstrate how the consultation provisions of the Class EA have been fulfilled, including documentation of all stakeholder consultation efforts undertaken during the planning process. This includes a discussion in the report that identifies concerns that were raised and **describes how they have been addressed by the proponent** throughout

the planning process. The report should also include copies of comments submitted on the project by interested stakeholders, and the proponent's responses to these comments (as directed by the Class EA to include full documentation).

- Please include the full stakeholder distribution/consultation list in the documentation.

Class EA Process

- If this project is a Master Plan: there are several different approaches that can be used to conduct a Master Plan, examples of which are outlined in Appendix 4 of the Class EA. **The Master Plan should clearly indicate the selected approach for conducting the plan**, by identifying whether the levels of assessment, consultation and documentation are sufficient to fulfill the requirements for Schedule B or C projects. Please note that any Schedule B or C projects identified in the plan would be subject to Part II Order Requests under the Environmental Assessment Act, although the plan itself would not be. **Please include a description of the approach being undertaken (use Appendix 4 as a reference).**

- If this project is a Master Plan: Any identified projects should also include information on the MCEA schedule associated with the project.

- The report should provide clear and complete documentation of the planning process in order to allow for transparency in decision-making.

- The Class EA requires the consideration of the effects of each alternative on all aspects of the environment (including planning, natural, social, cultural, economic, technical). The report should include a level of detail (e.g. hydrogeological investigations, terrestrial and aquatic assessments, cultural heritage assessments) such that all potential impacts can be identified, and appropriate mitigation measures can be developed. Any supporting studies conducted during the Class EA process should be referenced and included as part of the report.

- Please include in the report a list of all subsequent permits or approvals that may be required for the implementation of the preferred alternative, including but not limited to, MECP's PTTW, EASR Registrations and ECAs, conservation authority permits, species at risk permits, MTO permits and approvals under the *Impact Assessment Act*, 2019.

- Ministry guidelines and other information related to the issues above are available at http://www.ontario.ca/environment-and-energy/environment-and-energy. We encourage you to review all the available guides and to reference any relevant information in the report.

Amendments to the EAA through the Covid-19 Economic Recovery Act, 2020
Once the EA Report is finalized, the proponent must issue a Notice of Completion providing a minimum 30-day period during which documentation may be reviewed and comment and input can be submitted to the proponent. The Notice of Completion must be sent to the appropriate MECP Regional Office email address.

The public can request a higher level of assessment on a project if they are concerned about potential adverse impacts to constitutionally protected Aboriginal and treaty rights. In addition, the Minister may issue an order on his or her own initiative within a specified time period. The Director (of the Environmental Assessment Branch) will issue a Notice of Proposed Order to the proponent if the Minister is considering an order for the project within 30 days after the conclusion of the comment period on the Notice of Completion. At this time, the Director may request additional information from the proponent. Once the requested information has been received, the Minister will have 30 days within which to make a decision or impose conditions on your project.

Therefore, the proponent cannot proceed with the project until at least 30 days after the end of the comment period provided for in the Notice of Completion. Further, the proponent may not proceed after this time if:

- a Section 16 Order request has been submitted to the ministry regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, or
- the Director has issued a Notice of Proposed order regarding the project.

Please ensure that the Notice of Completion advises that outstanding concerns are to be directed to the proponent for a response, and that in the event there are outstanding concerns regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, Section 16 Order requests on those matters should be addressed in writing to:

Minister David Piccini
Ministry of Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

and

Director, Environmental Assessment Branch
Ministry of Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
EABDirector@ontario.ca

Stantec Consulting Ltd.
100-140 Ouellette Place, Windsor ON N8X 1L9

November 7, 2022
File: 165620266

Attention: Mr. Mark Badali Regional Environmental Planner

Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue W, 1st Floor
Toronto ON, M4V 1P5

Dear Mr. Badali,

Reference: Class Environmental Assessment – Colchester South Sewage Works Expansion, Town of Essex

Thank you for your prompt response to the August 15, 2022, Notice of Commencement for the Colchester South Sewage Works Expansion, Town of Essex. The following is in response to your advice on the Class EA, which was received on September 6, 2022.

Aboriginal Communities Consultation

The following communities have been included in the list of stakeholders identified as potentially affected by the proposed project:

- Aamjiwnaang First Nation
- Bkejwanong (Walpole Island)
- Caldwell First Nation
- Chippewas of Kettle and Stoney Point
- Chippewas of the Thames First Nation
- Oneida Nation of the Thames First Nation

These communities were notified of the project commencement and the project's first public information centre. We will continue to consult them as the project progresses.

Planning and Policy

After review of planning policies listed in your acknowledge letter, the following policy was identified as relevant to this project:

- Provincial Policy Statement (PPS) (2020) contains policies that protect Ontario's natural heritage and water resources. The PPS will be referenced in the report, which will describe how the proposed project is consistent with these policies. The planning context at the municipal and federal levels will also be discussed in the study report.

Source Water Protection

Source water protection will be reviewed as part of this EA study. A section on source water protection, which identify the source protection area and documenting how the proximity of the project to sources of drinking water and any delineated vulnerable areas was considered and assessed, will be included in the report. The report will review and discuss whether or not the project is located in a vulnerable area and provide details about the area.

Reference: Class Environmental Assessment – Colchester South Sewage Works Expansion, Town of Essex

Climate Change

In accordance with the guide "Considering Climate Change in the Environmental Assessment Process", we will include a discrete section in the report detailing how climate change was considered in the EA. During the assessment of alternative solutions and designs, we will consider the expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation) and resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation).

Effluent Objectives and Non-Compliance Limits

The existing Colchester Sewage Works operates under an Amended Environmental Compliance Approval (ECA) No. 9096-7SFHHG issued on May 28th, 2009. The expanded Colchester Sewage Works is to meet effluent compliance limits and objectives outlined in the current ECA.

Air Quality, Dust and Noise

Potential environmental (i.e. air quality, dust and noise) impacts and proposed mitigating measures are to be reviewed in this study. It will be recommended in the ESR report that, in final design stage, air dispersion and noise modelling reports are to be submitted to the MECP for environmental compliance approval.

Ecosystem Protection and Restoration

Potential impact on ecosystem is to be reviewed as part of this study. The ESR report is to describe proposed mitigation measures and how project planning will protect and enhance the local ecosystem. A Natural Heritage Impact Assessment will be completed to assess potential impacts and develop appropriate mitigation measures. The results of the assessment will be incorporated into the report and the Natural Heritage Impact Report will be included as part of the appendix.

The Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and Essex Region Conservation Authority (ERCA) were notified of the project, and we will continue to consult with them to determine if special measures or additional studies will be necessary to preserve and protect sensitive features.

Species at Risk

The Client's Guide to Preliminary Screening for Species at Risk (Draft May 2019) will be referenced. A Natural Heritage Impact Assessment will be carried out to identify whether there is any species at risk in the project area.

Surface Water

Potential impacts and proposed mitigating measures are to be reviewed on the natural features or ecological functions of any watercourses within the study area. We will include a section in the report referencing the ministry's Stormwater Management Planning and Design Manual (2003) and use it when designing stormwater control methods to mitigate the impact of proposed work.
A Stormwater Management Plan will be prepared as part of the Class EA process that includes:

- Strategies to address potential water quality and erosion impacts related to stormwater draining into streams or other sensitive environmental features, and to ensure that adequate (enhanced) water quality is maintained.
- Watershed information, drainage conditions, and other relevant background information.
- Future drainage conditions, stormwater management options, information on erosion and sediment control during construction, and other details of the proposed works.
- Information on maintenance and monitoring commitments.

A section will be included in the report discussing any potential approval requirements for surface water taking or discharge. It was noted that a Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, except for certain water taking activities that have been prescribed by the Water Taking EASR Regulation – O. Reg. 63/16. Prescribed water-taking activities require registration in the EASR instead of a PTTW.

Groundwater

The report will review any potential impacts and mitigation measures to water well supplies and existing groundwater conditions will be defined. In the case that construction or decommissioning of water wells is identified as an issue, the report will refer to Ontario Regulation 903, Wells, under the OWRA.

Excess Materials Management

The report will reference that activities involving the management of excess soil should be completed in accordance with O.Reg. 406/19 and the MECP's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014). All waste generated during construction is to be disposed of in accordance with ministry requirements.

Contaminated Sites

We will review whether there are any current or historical waste disposal sites and other known contaminated sites (local, provincial, federal), which may be impacted by the proposed work.

Servicing, Utilities and Facilities

The impact of proposed work on any above or underground utilities in the study area such as wastewater, water, stormwater is to be assessed and mitigation measures are to be taken if any impact is identified.

Mitigation and Monitoring

It will be noted in the report that all environmental standards and commitments are met for both construction and operation. The report will reference mitigation measures which will also be regularly monitored during construction.
The report will document the construction and post-construction monitoring plans, as outlined in Section A.2.5 and A.4.1 of the MEA Class EA parent document.

Consultation

The report will include a consultation section demonstrating how the consultation provisions of the Class EA have been fulfilled, including documentation of all stakeholder consultation efforts as well as copies of

Reference: Class Environmental Assessment – Colchester South Sewage Works Expansion, Town of Essex

comments submitted and our responses to these comments during the planning process. We will include a discussion in the report that identifies any concerns raised and how they have been addressed. We will also include the distribution list in the documentation.

Class EA Process

The report will include documentation of the planning process in order to allow for transparency in decision making.

The report will include results obtained from various assessments so that all potential impacts can be identified, and appropriate mitigation measures can be developed. The study reports will also be included in the appendices of the report.

A list of all subsequent permits or approvals that may be required for the implementation of the preferred alternative will be included in the report.

Upon finalization of the EA Report, a Notice of Completion will be issued providing a minimum 30-day period during which the documentation may be reviewed, and input can be submitted. The Notice of Completion will be sent to the Southwest MECP Regional Office email address.

The Notice of Completion will advise that outstanding concerns are to be directed to the proponent for a response, and that in the event there are outstanding concerns regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, Section 16 Order requests on those matters should be addressed in writing to:

Minister David Piccini
Ministry of Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

and

Director, Environmental Assessment Branch
Ministry of Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
EABDirector@ontario.ca

Stantec Consulting Ltd.

Hannah Rindlisbacher B.A.Sc., E.I.T.
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Phone: 519 966 2250 ext. 258
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Jian Li Ph.D., P.Eng., PE
Project Manager
Phone: 519 966 2250 ext. 240
jian.li@stantec.com

c. Mr. David McBeth, Manager, Capital Works & Asset Management, Town of Essex

Ministry of Tourism, Culture and Sport

Programs and Services Branch
400 University Ave, 5th Flr
Toronto, ON M7A 2R9
Tel: 613.242.3743

Ministère du Tourisme, Culture et Sport

Direction des programmes et des services
400, av. University, 5e étage
Toronto, ON M7A 2R9
Tél: 613.242.3743

Ontario

September 6, 2022 EMAIL ONLY

David McBeth,
Manager,
Capital Works and Asset Management
Town of Essex
dmcbeth@essex.ca

MTCS File	**:**	**0017422**
Proponent	**:**	**Town of Essex**
Subject	**:**	**Notice of Commencement – Schedule C MCEA**
Project	**:**	**Colchester South Sewage Works Expansion**
Location	**:**	**Town of Essex**

Dear David McBeth:

Thank you for providing the Ministry of Tourism and Culture and Sport (MTCS) with the Notice of Commencement for the above-referenced project. MTCS 's interest in this Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- archaeological resources, including land and marine;
- built heritage resources, including bridges and monuments; and
- cultural heritage landscapes.

Under the EA process, the proponent is required to determine a project's potential impact on known (previously recognized) and potential cultural heritage resources.

Project Summary
The Town has experienced increased wastewater servicing demands from significant development pressures within the community area. To ascertain this impact, the Town has initiated a Class Environmental Assessment (Class EA) to expand the existing Colchester South Sewage Works. The study is being undertaken in accordance with the planning and design process for 'Schedule C' projects outlined in the Municipal Class Environmental Assessment (June 2000, as amended in 2007, 2011 and 2015) under the Ontario Environmental Assessment Act.

Identifying Cultural Heritage Resources
While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation.

Archaeological Resources

This EA project may impact archaeological resources and should be screened using the MTCS *Criteria for Evaluating Archaeological Potential* and *Criteria for Evaluating Marine Archaeological Potential* to determine if an archaeological assessment is needed. MTCS archaeological sites data are available at *archaeology@ontario.ca*.

If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) shall be undertaken by an archaeologist licenced under the *Ontario Heritage Act (OHA)*, who is responsible for submitting the report directly to MTCS for review.

Built Heritage Resources and Cultural Heritage Landscapes

A Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment will be undertaken for the entire study area during the planning phase and will be summarized in the EA Report. This study will:

1. Describe the existing baseline cultural heritage conditions within the study area by identifying all known or potential built heritage resources and cultural heritage landscapes, including a historical summary of the study area. MTCS has developed screening criteria that may assist with this exercise: *Criteria for Evaluating for Potential Built Heritage Resources and Cultural Heritage Landscapes*.

2. Identify preliminary potential project-specific impacts on the known and potential built heritage resources and cultural heritage landscapes that have been identified. The report should include a description of the anticipated impact to each known or potential built heritage resource or cultural heritage landscape that has been identified.

3. Recommend measures to avoid or mitigate potential negative impacts to known or potential built heritage resources and cultural heritage landscapes. The proposed mitigation measures are to inform the next steps of project planning and design.

Given that this project covers a large study area, MTCS recommends that the Cultural Heritage Report is carried out so that step 1 described above is undertaken early in the planning process. Then, steps 2 and 3 can be undertaken once the preferred alternatives have been selected.

Cultural Heritage Reports will be undertaken by a qualified person who has expertise, recent experience, and knowledge relevant to the type of cultural heritage resources being considered and the nature of the activity being proposed.

Community input should be sought to identify locally recognized and potential cultural heritage resources. Sources include, but are not limited to, municipal heritage committees, historical societies and other local heritage organizations.

Cultural heritage resources are often of critical importance to Indigenous communities. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to them.

Environmental Assessment Reporting

All technical cultural heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MTCS whether any technical cultural heritage studies will be completed for this EA project and provide them to MTCS before issuing a Notice of Completion or commencing any work on the site. If screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Thank you for consulting MTCS on this project and please continue to do so throughout the EA process. If you have any questions or require clarification, please do not hesitate to contact me.

Sincerely,

Joseph Harvey
Heritage Planner
joseph.harvey@Ontario.ca

Copied to: Jian Li, Project Manager, Stantec Consulting Ltd.
Hannah Rindlisbacher, Environmental Engineer in Training, Stantec Consulting Ltd.

It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. MTCS makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MTCS be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

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

The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with Ontario Regulation 30/11 the coroner shall notify the Registrar, Ontario Ministry of Public and Business Service Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Tourism, Culture and Sport should also be notified (at archaeology@ontario.ca) to ensure that the archaeological site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*.

Stantec Consulting Ltd.
100-140 Ouellette Place, Windsor ON N8X 1L9

November 16, 2022
File: 165620266

Attention: Mr. Joseph Harvey, Heritage Planner

Ministry of Tourism, Culture and Sport
400 University Avenue, 5th Floor
Toronto ON, M7A 2R9

Dear Mr. Harvey,

Reference: Class Environmental Assessment – Colchester South Sewage Works Expansion, Town of Essex

Thank you for your prompt response to the August 15, 2022, Notice of Study Commencement for the Colchester South Sewage Works Expansion, Town of Essex. The following is in response to your advice regarding the Class EA, which was received on September 6th, 2022.

Identifying Cultural Heritage Resources

Our Cultural Heritage team will use screening and evaluation to determine if there are any other cultural heritage resources.

Archaeological Resources

Our Cultural Heritage team will complete the *Criteria for Evaluating Archaeological Potential* and *Criteria for Evaluating Marine Archaeological Potential* screening checklists to determine if an archaeological assessment is needed.

Built Heritage Resources and Cultural Heritage Landscapes

We will provide a refined study area for the project as we move into the Phase 3 of the Class Environmental Assessment – identification of alternative design solutions. Our Cultural Heritage Specialists will complete the *Criteria for Evaluating for Potential Built Heritage Resources and Cultural Heritage Landscapes* screening for the refined study area to determine whether a Culture Heritage Report is required.

Environmental Assessment Reporting

We will advise the MTCS of any technical cultural heritage studies that will be completed for this EA project and provide it before issuing a Notice of Completion or commencing any work on site. The completed checklists and supporting documentation will be included in the EA report.

Reference: **Class Environmental Assessment – Colchester South Sewage Works Expansion, Town of Essex**

Stantec Consulting Ltd.

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training
Phone: 519 966 2250 ext. 258
hannah.rindlisbacher@stantec.com

Jian Li Ph.D., P.Eng., PE
Project Manager
Phone: 519 966 2250 ext. 240
jian.li@stantec.com

c. Mr. David McBeth, Manager, Capital Works & Asset Management, Town of Essex

From:	Mentley, Ryan (MTO)
To:	Rindlisbacher, Hannah
Subject:	RE: 165620266: Notice of Study Commencement - Class EA Colchester South Sewage Works Expansion, Town of Essex
Date:	Wednesday, September 28, 2022 11:55:50 AM
Attachments:	~WRD0747.jpg

Hi Hanna,

I might have skipped over this email and wanted to make sure I provided a response. The subject area is outside the MTO PCA, as such, MTO permits are not required.

Please let me know if you have any questions.

Regards,

Ryan Mentley
Corridor Management Planner
Highway Corridor Management Section
Ministry of Transportation
659 Exeter Road, London ON, N6E 1L3
Tel: (519) 878-4026
Fax: (519) 873-4228
Ryan.Mentley@Ontario.ca

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: August 15, 2022 11:12 AM
To: Mentley, Ryan (MTO) <Ryan.Mentley@ontario.ca>
Subject: 165620266: Notice of Study Commencement - Class EA Colchester South Sewage Works Expansion, Town of Essex

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Dear Ryan,

The Town of Essex is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to accommodate increasing wastewater servicing demands due to significant development pressures within the Colchester South community. This study will satisfy the planning and design process for 'Schedule C' projects which will involve the identification and description of the problem or opportunity, the evaluation of alternative solutions and design concepts for the expansion of the existing Colchester South Sewage Works. A copy of the Notice of Study Commencement for the project is attached.

On behalf of the Town of Essex, we are inviting you to participate in this project and to assist us in identifying the environmental, social, and cultural values your community may have within the Project Area. A reply by September 16th, 2022, would be appreciated so that we may consider your comments early in this study stage.

If you have any comments or concerns regarding this project and wish to provide input into the Study, please contact the undersigned below or one of the individuals named in the attached Notice of Commencement.

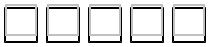
Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9





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From:	Kimberly Darroch
To:	Rindlisbacher, Hannah
Cc:	Planning; Li, Jian
Subject:	RE: 165620266: Notice of Study Commencement - Class EA Colchester South Sewage Works Expansion, Town of Essex
Date:	Monday, August 22, 2022 1:09:37 PM

Thank you.

KIM DARROCH, B.A.(HONS.), M.PL., RPP, MCIP
Team Lead, Planning Services, Watershed Management Services
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 | Essex, Ontario | N8M 1Y6
P. 519-776-5209 x 347 | F. 519-776-8688
kdarroch@erca.org www.essexregionconservation.ca

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Follow us on Twitter: @essexregionca

**NOTE: In accordance with public health guidelines, our offices are closed to the public, but staff are working remotely to provide responses to inquiries and review applications as efficiently as possible. Your patience and understanding is greatly appreciated at this time. **

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: Monday, August 22, 2022 12:09 PM
To: Kimberly Darroch <KDarroch@erca.org>
Cc: Planning <planning@ERCA.org>; Li, Jian <jian.li@stantec.com>
Subject: RE: 165620266: Notice of Study Commencement - Class EA Colchester South Sewage Works Expansion, Town of Essex

Good Afternoon Kimberly,

Attached is a map showing the study area boundaries for the Colchester South Sewage Works Expansion. Let me know if you need any other information.

Thanks,

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

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From: Kimberly Darroch <KDarroch@erca.org>
Sent: Tuesday, August 16, 2022 1:10 PM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Cc: Planning <planning@ERCA.org>
Subject: RE: 165620266: Notice of Study Commencement - Class EA Colchester South Sewage Works Expansion, Town of Essex

Thank you for the Notice.

Could you please forward a better map showing the study area boundaries for our review at the ERCA?

I have copied our Planning inbox. Please send all Class EA study correspondence to the Planning inbox in the future, including Notices of Study Commencements, PICs, Completions, etc. Our office can provide feedback once some preliminary information is provided and reviewed. If there is more information, at this time, please forward to our attention or any other supporting background materials that you feel is appropriate for the ERCA review of this Project, at this point, in the approval process. Note, that depending on our level of involvement, there may be a fee charged for our review and or time spent this type of study.

Please keep the following on the study distribution list:

planning@erca.org – Planning inbox
tmartin@erca.org – Tian Martin, P.Eng., Water Resources Engineer

Regards,

KIM DARROCH, B.A.(HONS.), M.PL., RPP, MCIP
Team Lead, Planning Services, Watershed Management Services
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 | Essex, Ontario | N8M 1Y6
P. 519-776-5209 x 347 | F. 519-776-8688
kdarroch@erca.org www.essexregionconservation.ca

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Follow us on Twitter: @essexregionca

**NOTE: In accordance with public health guidelines, our offices are closed to the public, but staff are working remotely to provide responses to inquiries and review applications as efficiently as possible. Your patience and understanding is greatly appreciated at this time. **

From: Rindlisbacher, Hannah < >
Sent: Monday, August 15, 2022 2:13 PM
To: Planning <planning@ERCA.org>
Subject: 165620266: Notice of Study Commencement - Class EA Colchester South Sewage Works Expansion, Town of Essex

To Whom it May Concern,

The Town of Essex is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to accommodate increasing wastewater servicing demands due to significant development pressures within the Colchester South community. This study will satisfy the planning and design process for 'Schedule C' projects which will involve the identification and description of the problem or opportunity, the evaluation of alternative solutions and design concepts for the expansion of the existing Colchester South Sewage Works. A copy of the Notice of Study Commencement for the project is attached.

On behalf of the Town of Essex, we are inviting you to participate in this project and to assist us in identifying the environmental, social, and cultural values your community may have within the Project Area. A reply by September 16th, 2022, would be appreciated so that we may consider your comments early in this study stage.

If you have any comments or concerns regarding this project and wish to provide input into the Study, please contact the undersigned below or one of the individuals named in the attached Notice of Commencement.

Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

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From: Enviroinfo (ECCC)
To: Rindlisbacher, Hannah
Subject: Automatic reply: 165620266: Notice of Study Commencement - Class EA Colchester South Sewage Works Expansion, Town of Essex
Date: Monday, August 15, 2022 11:30:33 AM

English follows

Merci d'avoir communiqué avec le Centre de renseignements à la population d'Environnement et Changement climatique Canada. Nous accusons réception de votre demande et vous répondrons dans les meilleurs délais.

Nos bureaux sont ouverts du lundi au vendredi, de 8 h 30 à 16 h 30, Heure de l'Est. À noter que nos bureaux sont fermés les jours fériés.

S'il s'agit d'une situation d'urgence, il faut informer les autorités fédérales et provinciales ou territoriales, qui assureront la coordination de la surveillance adéquate des interventions. Pour obtenir de plus amples renseignements, visitez le: https://www.canada.ca/fr/environnement-changement-climatique/services/programme-urgences-environnementales/personnes-ressources-province.html.

***Veuillez noter que compte tenu de la situation actuelle avec la COVID-19, le Centre de renseignements à la population d'Environnement et Changement climatique Canada opère à distance et le personnel est réduit pour répondre aux demandes. Nous répondrons à votre demande le plus rapidement possible. Merci de votre compréhension.

Nous vous souhaitons une journée toute en santé.

L'équipe du centre de renseignements

Thank you for contacting the Public Inquiry Centre of Environment and Climate Change Canada. We acknowledge receipt of your request and will get back to you as soon as possible.

Our offices are open Monday to Friday from 8:30 a.m. to 4:30 p.m., Eastern Time. Please note our offices are closed on statutory holidays.

In the event of an emergency pollution incident, federal and provincial/territorial authorities need to be notified in order to coordinate an adequate oversight of the response. For more information, please visit: https://www.canada.ca/en/environment-climate-change/services/environmental-emergencies-program/contacts-province.html.

***Given the current situation with COVID-19, Environment and Climate Change Canada's Public Inquiries Centre is operating remotely and there are reduced staff to respond to inquiries. We will respond to your inquiry as soon as possible. Thank you for your understanding.

We wish you a healthy day.

Public Inquiry Centre team

From:	Bergman, Stephanie (MMAH)
To:	Rindlisbacher, Hannah
Cc:	Boyd, Erick (MMAH)
Subject:	RE: 165620266: Notice of Study Commencement - Class EA Colchester South Sewage Works Expansion, Town of Essex
Date:	Monday, August 15, 2022 4:47:27 PM

Hi there Hannah,

Just confirming receipt of this notice, and we will let you know if we have any questions. Thank you,

Stephanie L. Bergman, MA, MPlan
Planner
Ministry of Municipal Affairs and Housing
Cell: 519-670-6144

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: Monday, August 15, 2022 11:01 AM
To: Kerr, Ian (MMAH) <Ian.Kerr@ontario.ca>
Subject: 165620266: Notice of Study Commencement - Class EA Colchester South Sewage Works Expansion, Town of Essex

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Dear Ian,

The Town of Essex is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to accommodate increasing wastewater servicing demands due to significant development pressures within the Colchester South community. This study will satisfy the planning and design process for 'Schedule C' projects which will involve the identification and description of the problem or opportunity, the evaluation of alternative solutions and design concepts for the expansion of the existing Colchester South Sewage Works. A copy of the Notice of Study Commencement for the project is attached.

On behalf of the Town of Essex, we are inviting you to participate in this project and to assist us in identifying the environmental, social, and cultural values your community may have within the Project Area. A reply by September 16th, 2022, would be appreciated so that we may consider your comments early in this study stage.

If you have any comments or concerns regarding this project and wish to provide input into the Study, please contact the undersigned below or one of the individuals named in the attached Notice of Commencement.

Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

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Ministry of Northern Development, Mines, Natural Resources and Forestry

ministère du Développement du Nord, des Mines, des Richesses naturelles et des Forêts

Ontario

August 18th, 2022

Dear Mr. McBeth & Dr. Li

SUBJECT: Colchester South Sewage Works Expansion Class EA

The Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) received the notice of study commencement on August 15, 2022. Thank you for circulating this to our office. Please note that we have not competed a comprehensive screening of natural heritage or other resource values for the project at this time. During our initial review the provincially significant wetland of *Lypp's Beach* was identified on adjacent lands. This response will provide information to guide you in identifying and assessing natural features and resources as required by applicable policies and legislation, as well as engaging with the Ministry for advice as needed.

Please also note that it is the proponent's responsibility to be aware of, and comply with, all relevant federal or provincial legislation, municipal by-laws or other agency approvals.

Natural Heritage

NDMNRF's natural heritage and natural resources GIS data layers can be obtained through the Ministry's Land Information Ontario (LIO) website. You may also view natural heritage information online (e.g., Provincially Significant Wetlands, ANSI's, woodlands, etc.) using the Make a Map: Natural Heritage Areas tool.

We recommend that you use the above-noted sources of information during the review of your project proposal.

Natural Hazards

A series of natural hazard technical guides developed by NDMNRF are available to support municipalities and conservation authorities implement the natural hazard policies in the Provincial Policy Statement (PPS). For example, standards to address flood risks and the potential impacts and costs from riverine flooding are addressed in the *Technical Guide River and Stream Systems: Flooding Hazard Limit (2002)*. We recommend that you consider these technical guides as you assess specific improvement projects that can be undertaken to reduce the risk of flooding.

Petroleum Wells & Oil, Gas and Salt Resources Act

There may be petroleum wells within the proposed project area. Please consult the Ontario Oil, Gas and Salt Resources Library website (www.ogsrlibrary.com) for the best-known data on any wells recorded by NDMNRF. Please reference the 'Definitions and Terminology Guide' listed in the publications on the library website to better understand the well information available. Any oil and gas wells in your project area are regulated by the *Oil, Has and Salt Resource Act*, and the supporting regulations and operating standards. If any unanticipated wells are encountered during development of the project, or if the proponent has questions regarding petroleum operations, the proponent should contact the Petroleum Operations Section at POSRecords@ontario.ca or 519-873-4634.

Fish and Wildlife Conservation Act

Please note, that should the project require:

- The relocation of fish outside of the work area, a Licence to Collect Fish for Scientific Purposes under the *Fish and Wildlife Conservation Act* will be required.
- The relocation of wildlife outside of the work area (including amphibians, reptiles, and small mammals), a Wildlife Collector's Authorization under the *Fish and Wildlife Conservation Act* will be required.

Public Lands Act & Lakes and Rivers Improvement Act

Some Project may be subject to the provisions of the *Public Lands Act* or *Lakes and River Improvement Act*. Please review the information on NDMNRF's web pages provided below regarding when an approval is, or is not, required. Please note that many of the authorizations under the *Lakes and Rivers Improvement Act* are administered by the local Conservation Authority.

- For more information about the *Public Lands Act*: https://www.ontario.ca/page/crown-land-work-permits
- For more information about the *Lakes and Rivers Improvement Act*: https://www.ontario.ca/page/lakes-and-rivers-improvement-act-administrative-guide

If you have identified any of NDMNRF's interests and/or may require permit(s) or further technical advice, please direct your specific questions to Iain Quigley.

If you have any questions or concerns, please feel free to contact me.

Best Regards,

Iain Quigley

Iain Quigley
Regional Lands Intern
Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF)
705-772-9310
Iain.Quigley@ontario.ca

APPENDIX D

Response from Review Agencies – Public Information Centre No.1

planning@erca.org
P.519.776.5209
F.519.776.8688
360 Fairview Avenue West
Suite 311, Essex, ON N8M 1Y6

October 27, 2022

Hannah Rindlisbacher, E.I.T.
Stantec Consulting Ltd.
2555 Ouellette Avenue, Unit 100
Windsor ON N8X 1L9

Dear Ms. Rindlisbacher:

RE: 165620266 - Notice of Public Information Centre - Class EA Colchester South Sewage Works Expansion, Town of Essex

This letter is in response to our receipt and review of the Notice of Public Information Centre, relating to the Class EA for the Colchester South Sewage Works Expansion, within the Town of Essex. It is our understanding that this process is following the Municipal Class EA in accordance with the planning and design process for "Schedule C" projects as outlined in the Municipal Class Environmental Assessment (June 2000, as amended in 2007, 2011 and 2015) under the Ontario *Environmental Assessment Act*. At this time, we offer the following general comments in regards to the study area subject to the Class EA.

We note that portions of the existing service area contains lands which are subject to our Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation under the *Conservation Authorities Act* (Ontario Regulation No. 158/06), falling within the Limit of Regulated Area of Lake Erie. Therefore, any works within a regulated area will be required to obtain a Permit and/or Clearance from the Essex Region Conservation Authority prior to any construction or site alteration or other activities affected by Section 28 of the *Conservation Authorities Act*.

Portions of the study area for this EA also fall within a Surface Water Intake Protection Zone. The Essex Region Conservation Authority is the designated Risk Management Official/Inspector providing Risk Management Services for the Essex Region Source Protection Area where the study area is located. New projects within this area may require approval by the Essex Region Risk Management Official (RMO) to ensure that appropriate actions are taken to mitigate any potential drinking water threats. For any questions regarding Source Water Protection and the applicable source protection plan policies that may apply to the site, please contact the Essex Region Risk Management Official. The Essex Region's Risk Management Official can be reached by email at riskmanagement@erca.org.

In addition, portions of the study area for this EA also fall within a Highly Vulnerable Aquifer (HVA) / Significant Groundwater Recharge Area (SGRA). There are no associated Significant Drinking Water Threats (SDWTS) or policies with these areas because the municipal water treatment plant does not use groundwater as its supply. However, the proponent should consider the sensitive nature of this natural feature. These areas are at a greater risk for contamination from land use activities. Any future proposed activity on these properties at minimum should not result in increased risk of contamination of the aquifer or recharge area.

The properties associated with the Colchester South Wastewater Treatment Facility do contain some natural vegetation and are immediately adjacent to the Lypps Beach Provincially Significant Wetland. Any expansion to the exiting facility should ensure no negative impact on any significant natural heritage

Essex Region Conservation Authority
sustaining the place for life

features that may potentially be affected by any works associated with upgrades or expansions to this facility.

Our office can provide specific feedback on the project once some detailed information is provided and reviewed. Please let us know when any supporting background materials will be available, that you feel are appropriate for ERCA review, at this point in the approval process. Note, that depending on our level of involvement, there may be a fee charged for our review and or time spent this type of study.

Our office would like to remain on the distribution list for subsequent notifications for this project. Please keep the following on the study distribution list:

planning@erca.org – Planning inbox
tmartin@erca.org – Tian Martin, P.Eng., *Water Resources Engineer*.

If you have any questions or require any additional information, please contact the undersigned.

Thank you.

Sincerely,

Kim Darroch

Kim Darroch, B.A.(HONS.), M.PL., RPP, MCIP
Team Lead, Planning Services, Watershed Management Services

/dl

Stantec Consulting Ltd.
100-140 Ouellette Place, Windsor ON N8X 1L9

November 23, 2022
File: 165620266

Attention: Ms. Kim Darroch

Essex Region Conservation Authority
360 Fairview Avenue West
Suite 11, Essex, ON N8M 1Y6

Dear Ms. Darroch,

Reference: Class Environmental Assessment – Colchester South Sewage Works Expansion, Town of Essex

Thank you for your prompt response to the October 17th, 2022, Notice of Public Information Centre for the Colchester South Sewage Works Expansion, Town of Essex. The following is in response to your comments regarding the study area subject to the Class EA, which was received on October 27th, 2022.

Regulated Area

It was noted that portions of the existing service area contain lands which are subject to the Development Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation under the Conservation Authorities Act (Ontario Regulation No. 158/06), falling within the Limit of Regulated Area of Lake Erie. It will be noted in the ESR that a Permit and/or Clearance from the Essex Region Conservation Authority is required prior to any construction or site alteration, or other activities affected by Section 28 of the *Conservation Authorities Act*.

Surface Water Intake Protection Zone

Since portions of the study area for this EA also fall within a Surface Water Intake Protection Zone we will include in the ESR that any new projects within this area may require approval by the Essex Region Risk Management Official (RMO) to ensure that threats to potential drinking water are mitigated.

Highly Vulnerable Aquifer (HVA) / Significant Groundwater Recharge Area (SGRA)

Although portions of the study area for this EA fall within a HVA / SGRA, there are no Significant Drinking Water Threats (SDWTS) or policies in the area since the municipal water treatment plant does not use groundwater as its supply. The sensitive nature of this natural feature will be considered since these areas may be at a greater risk for contamination from land use activities. We are aware that any proposed activity on these properties at minimum should not result in increased risk of contamination of the aquifer or recharge area.

Reference: **Class Environmental Assessment – Colchester South Sewage Works Expansion, Town of Essex**

Natural Vegetation

We understand that the properties associated with the Colchester South Wastewater Treatment Facility contains natural vegetation and are immediately adjacent to the Lypps Beach Provincially Significant Wetland. For any proposed expansion to the existing facility, mitigations measures will be taken to avoid negative impacts on the natural heritage.

Project Progress

We will keep ERCA informed as more information becomes available. We will keep the following contacts on the study distribution list:

planning@erca.org – Planning inbox
tmartin@erca.org – Tian Martin, P. Eng., *Water Resources Engineer*

Stantec Consulting Ltd.

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training
Phone: 519 966 2250 ext. 258
hannah.rindlisbacher@stantec.com

Jian Li Ph.D., P.Eng., PE
Project Manager
Phone: 519 966 2250 ext. 240
jian.li@stantec.com

c. Mr. David McBeth, Manager, Capital Works & Asset Management, Town of Essex

From:	OP Habitat (DFO/MPO)
To:	Rindlisbacher, Hannah
Subject:	RE: 165620266: Notice of Public Information Centre - Class EA Colchester South Sewage Works Expansion, Town of Essex
Date:	Wednesday, October 26, 2022 10:37:32 AM
Attachments:	image001.jpg image002.jpg

Good morning Hannah,

The *Fisheries Act* requires that projects avoid causing death of fish or any harmful alteration, disruption or destruction of fish and/or fish habitat unless authorized by the Minister of Fisheries and Oceans Canada. The Fish and Fish Habitat Protection Program of Fisheries and Oceans Canada reviews projects to ensure compliance with the *Fisheries Act* and *Species At Risk Act*.

Please note that the Fish and Fish Habitat Protection Program is not able to provide comment regarding general planning. If planned works may cause any of the prohibited effects under the *Fisheries Act* or *Species at Risk Act*, a Request for Review form should be completed for the works and submitted to FisheriesProtection@dfo-mpo.gc.ca. To better understand the review process, please visit http://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/request-review-demande-d-examen-001-eng.html. The Request for Review form can be found under Step 4 at that link.

Sincerely,

Ashley Lindley
A/Senior Biologist, Fish and Fish Habitat Protection Program |Biologiste, Programme de protection du poisson et sonde son habitat
Fisheries and Oceans Canada | Pêches et Océans Canada

Fisheries and Oceans Canada has changed the way new project proposals (referrals), reports of potential Fisheries Act violations (occurrences) and information requests are managed. Please be advised that general information regarding the management of impacts to fish and fish habitat (e.g. Measures to Protect Fish and Fish Habitat) that enable you to determine Fisheries Act requirements are available at DFO's "Projects Near Water" website at www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html. For all occurrence reports, or project proposals where you have determined that you cannot avoid impacts to fish and fish habitat, please submit to fisheriesprotection@dfo-mpo.gc.ca. For general inquiries, call 1-855-852-8320.

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: Tuesday, October 18, 2022 2:43 PM
To: Eddy, Sara <Sara.Eddy@dfo-mpo.gc.ca>
Subject: 165620266: Notice of Public Information Centre - Class EA Colchester South Sewage Works Expansion, Town of Essex

Dear Sara,

The Town of Essex is undertaking the Class Environmental Assessment (EA) process for the expansion of the existing Colchester South sewage works to accommodate increasing wastewater servicing demands due to new development pressures. This Class EA will involve public and review agency consultation, an evaluation of alternatives, an assessment of the potential environmental effects of the proposed works, and identification of reasonable measures to mitigate any adverse impacts that may result.

The Town is hosting a Public Information Centre (PIC) to present the evaluation of alternative solutions and receive input from interested residents and stakeholders. The PIC will be held on Wednesday October 26th, 2022 (4:00 to 7:00 pm) at the Colchester Community Centre, 100 Jackson Street, Harrow, ON. A copy of the Notice of Public Information Centre for the project is attached and additional information regarding the project is available on the Town's Webpage: https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

If you have any comments or concerns regarding this project, please contact the undersigned.

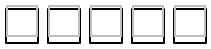
Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9





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From: Enviroinfo (ECCC)
To: Rindlisbacher, Hannah
Subject: Automatic reply: 165620266: Notice of Public Information Centre - Class EA Colchester South Sewage Works Expansion, Town of Essex
Date: Tuesday, October 18, 2022 2:44:22 PM

English follows

Merci d'avoir communiqué avec le Centre de renseignements à la population d'Environnement et Changement climatique Canada. Nous accusons réception de votre demande et vous répondrons dans les meilleurs délais.

Nos bureaux sont ouverts du lundi au vendredi, de 8 h 30 à 16 h 30, Heure de l'Est. À noter que nos bureaux sont fermés les jours fériés.

S'il s'agit d'une situation d'urgence, il faut informer les autorités fédérales et provinciales ou territoriales, qui assureront la coordination de la surveillance adéquate des interventions. Pour obtenir de plus amples renseignements, visitez le: https://www.canada.ca/fr/environnement-changement-climatique/services/programme-urgences-environnementales/personnes-ressources-province.html.

***Veuillez noter que compte tenu de la situation actuelle avec la COVID-19, le Centre de renseignements à la population d'Environnement et Changement climatique Canada opère à distance et le personnel est réduit pour répondre aux demandes. Nous répondrons à votre demande le plus rapidement possible. Merci de votre compréhension.

Nous vous souhaitons une journée toute en santé.

L'équipe du centre de renseignements

Thank you for contacting the Public Inquiry Centre of Environment and Climate Change Canada. We acknowledge receipt of your request and will get back to you as soon as possible.

Our offices are open Monday to Friday from 8:30 a.m. to 4:30 p.m., Eastern Time. Please note our offices are closed on statutory holidays.

In the event of an emergency pollution incident, federal and provincial/territorial authorities need to be notified in order to coordinate an adequate oversight of the response. For more information, please visit: https://www.canada.ca/en/environment-climate-change/services/environmental-emergencies-program/contacts-province.html.

***Given the current situation with COVID-19, Environment and Climate Change Canada's Public Inquiries Centre is operating remotely and there are reduced staff to respond to inquiries. We will respond to your inquiry as soon as possible. Thank you for your understanding.

We wish you a healthy day.

Public Inquiry Centre team

From:	Bergman, Stephanie (MMAH)
To:	Rindlisbacher, Hannah
Cc:	Kim, Gabriel (MMAH); Boyd, Erick (MMAH)
Subject:	FW: 165620266: Notice of Public Information Centre - Class EA Colchester South Sewage Works Expansion, Town of Essex
Date:	Tuesday, October 18, 2022 3:01:50 PM
Attachments:	1. Notice of Public Information Centre.pdf 2. Public Open House Feedback Form.pdf

Hi there Hannah,

Just confirming receipt of this Notice of PIC. We will let you know if we have any questions or concerns. Thank you,

Stephanie L. Bergman, MA, MPlan
Planner
Ministry of Municipal Affairs and Housing
Cell: 519-670-6144

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: October 18, 2022 2:21 PM
To: Boyd, Erick (MMAH) <Erick.Boyd@ontario.ca>
Subject: 165620266: Notice of Public Information Centre - Class EA Colchester South Sewage Works Expansion, Town of Essex

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Dear Erick,

The Town of Essex is undertaking the Class Environmental Assessment (EA) process for the expansion of the existing Colchester South sewage works to accommodate increasing wastewater servicing demands due to new development pressures. This Class EA will involve public and review agency consultation, an evaluation of alternatives, an assessment of the potential environmental effects of the proposed works, and identification of reasonable measures to mitigate any adverse impacts that may result.

The Town is hosting a Public Information Centre (PIC) to present the evaluation of alternative solutions and receive input from interested residents and stakeholders. The PIC will be held on Wednesday October 26th, 2022 (4:00 to 7:00 pm) at the Colchester Community Centre, 100 Jackson Street, Harrow, ON. A copy of the Notice of Public Information Centre for the project is attached and additional information regarding the project is available on the Town's Webpage: https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

If you have any comments or concerns regarding this project, please contact the undersigned.

Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033

hannah.rindlisbacher@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9





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APPENDIX D

Response from Public – Public Information Centre No.1

TOWN OF ESSEX
CLASS ENVIRONMENTAL ASSESSMENT
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
PUBLIC INFORMATION CENTRE
Colchester Community Centre
October 26th, 2022 – 4:00 p.m. to 7:00 p.m.
SIGN-IN SHEET

No.	Name (Please Print)	Address	Telephone Number
1	TODD PRAZA	477 LAKECREST CRT	519 9806388
2	ERIKA + JIM VALVASORI	843 ERIE BLUE	2267889180
3	PAUL INNES	170 DUNN RD	519-995-1772
4	Bob & Mary Ribordy	433 Lake Crest Crt.	519-239-3075
5	Mike Kelly	407 Lake Crest Cr	519-735-5682
6	ROB DIMENNA	457 LAKECREST CT	519-996-0957
7	Dave Fuchs	861 Erie Blue Dr	403.660.2245
8	MARK LOKUN	393 ERIE AIRE BEACH	519-817-7049
9	Angela & Kevin Ritchie	441 Lake Crest Crt	519-830-4988
10	Eric and Allison Campbell	431 Lake Crest Crt	519 800 9757
11	MARK LABUTE	439 LAKE CREST CRT	519-981-2232
12			

2findmcl@gmail.com

COLCHESTER SOUTH SEWAGE WORKS EXPANSION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the Colchester South Sewage Works Expansion:

Nice Presentation

Who will pay for the sewage expansion? We do not have sewers - will we be be paying for this expansion?

We are on ERIE BLUE!

NAME ERIKA VALVASORI

EMAIL ADDRESS ERIKAVALVASORI@MDIRECT.N

TELEPHONE NO. ( )

DATE Oct 26/22 SIGNATURE

Stantec

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COLCHESTER SOUTH SEWAGE WORKS EXPANSION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the Colchester South Sewage Works Expansion:

Public Notice for future meetings / open houses
Please add to all notifications

NAME Angela Ritchie

EMAIL ADDRESS angelaritchie247@gmail.com

TELEPHONE NO. (519) 830-4958

DATE Oct 26/22 SIGNATURE

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From: Rindlisbacher, Hannah
To: Allison C
Cc: Li, Jian; McBeth, David; sbondy@essex.ca
Subject: RE: Colchester South Sewage Works Expansion, Town of Essex (Project 165620266)
Date: Monday, December 5, 2022 11:46:00 AM

Good morning Allison,

Thank you for attending the Public Information Centre and providing your feedback on the Colchester South Sewage Works Expansion. Please see our response to your comments below in blue font.

Regards,

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

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Windsor ON N8X 1L9

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Please consider the environment before printing this email.

From: Allison C <avg4318@hotmail.com>
Sent: Wednesday, November 30, 2022 4:40 PM
To: dmcbeth@essex.ca; Li, Jian <jian.li@stantec.com>; Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>; sbondy@essex.ca
Subject: Colchester South Sewage Works Expansion, Town of Essex (Project 165620266)

November 30, 2022

Re: Colchester South Sewage Works Expansion (project 165620266)

After reviewing the project webpage and attending the Public Information Centre, the following are my concerns with the Colchester South Sewage Works Expansion.

Firstly, it is extremely disappointing that there was no notice provided to neighbouring properties that would be directly affected by an expansion of the Colchester South Sewage Works. All of the neighbouring properties to the property being considered for Option 7 should be notified in writing prior to any additional information sessions and/or meetings.

Prior to the 1st Public Information Centre (PIC) held on October 26, the PIC notice was posted on the Town's website and published in the Harrow News. We also delivered physical letters of the Notice

to the adjacent property owners on November 8. Although the PIC was held on October 26, the public including the adjacent residents was able to review the PIC posters and provide feedback through the Town's website up until November 30th, 2022. Should any residents wish to discuss this study further or require additional information, we are available to meet with them in person or virtually at their convenience.

With regards to the information presented, there was no option to simply upgrade the current facility without expanding. Given that the current facility was built several decades ago and the technology for processing has changed, could an upgrade to the current facility provide the adequate increase in flow rate needed for the proposed development? This option would truly have a minimal impact on neighbouring properties and the details regarding the feasibility of an upgrade should be presented to residents, even if this is an option that would not provide the required increases.

Please be advised that this study is being carried out in accordance with the following Municipal Class Environmental Assessment process:

Phase 1 – Identification of the problem

Phase 2 – Identification of alternative solutions to the problem, consultation with review agencies and the public, selection of the preferred solution, and identification of the project.

Phase 3 – Identification of alternative design concepts (technical alternatives) for the preferred solution, evaluation of the alternative designs and their impacts on the environment, consultation with review agencies and the public and selection of the preferred design.

Phase 4 – Preparation of an Environmental Study Report (ESR) to document the planning, design and consultation process for the project. The ESR is placed on the public registry for scrutiny by review agencies and the public.

Phase 5 – Final design, construction and commissioning of the selected technical alternative. Monitoring of construction for adherence to environmental provisions and commitments.

We are currently still in Phase 2 and reviewing input from the public and review agencies in order to determine the preferred solution.

At this time, we have not yet identified and evaluated any technical alternatives for the lagoon expansions/upgrades. Upon the completion of Phase 2, we will move on to Phase 3. Discussions of improving the efficiency of the existing facility will take place in Phase 3 of the Class EA process when the alternative design solutions are identified. Phase 3 study will be presented at PIC No.2 next year.

An additional concern is the cost of these upgrades. There is no data indicating that the current facility is failing or not meeting the needs of the current service. The expansion and upgrade of the

facility seem only to be necessary to facilitate further development in Colchester and therefore the cost of these upgrades and expansion should not fall on the current residents but should be covered by the new developments that are the reason for the expansion.

Furthermore, the justification for this plan is specific only to the development in Colchester, according to the information presented at the Public Information Centre. What will the impact be of other proposed developments including Ambassador Beach as this was not included in the presentation and the information session. (Refer to the following Windsor Star article from October 13, 2022 - https://windsorstar.com/news/local-news/eco-friendly-housing-development-planned-in-colchester)

This study is initiated by the proposed development. However, this study will determine a long-term solution to accommodate increased wastewater servicing demands from the proposed development as well as other future developments and population growth in the Colchester South service area.

The environmental impact of the expansion is also a concern. There are a significant number of trees and wildlife, including species that are endangered in Ontario (for example the Eastern fox snake - https://www.ontario.ca/page/eastern-foxsnake) that live in the natural environment that would be destroyed by this expansion. How does the town of Essex justify this destruction of natural habitat and further endangering of wildlife? What environmental assessments will be done prior to the development of any further plans?

As part of this Class Environmental Assessment we will continue to consult with the Ministry of Environment, Conservation and Parks (MECP), the Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and the Essex Region Conservation Authority (ERCA) to determine if special measures or additional studies will be necessary to preserve and protect sensitive features.

Potential impacts on the ecosystem will be identified as part of this study. Any expansion/upgrade to the existing facility will be carried out in accordance with MECP standards for environmental impacts. The ESR report will describe proposed mitigation measures and how project planning will protect and enhance the local ecosystem. A Natural Heritage Impact Assessment will be carried out to identify whether there is any species at risk in the project area.

Also, the current facility does off-gas and produce noise pollution to neighbouring properties. These were minimal but over the summer three trees were taken down on the property that were between the current facility and some homes and since then we have noticed an increase in both odours and noise. If there is no other choice but to expand, a significant natural buffer should be mandatory to protect the families living on the adjacent properties.

At this time, we have not yet identified and evaluated any technical alternatives for the lagoon expansions/upgrades. Any expansion/upgrade to the existing facility will be carried out to comply with MECP standards for noise, vibration, odour or air pollution emissions. The evaluation of lagoon expansions/upgrade alternatives will be presented at PIC No.2 next year.

Finally, the expansion of the current facility would decrease the value of my property and that of my neighbours. As tax payers in the town of Essex and members of our local beach community, we are all committed to maintaining and improving our properties. In assessing the desirable features of properties, having a sewage treatment facility across the road is not an asset but a detriment. I am concerned for my property value and the investment that I made in the town of Essex. Again, should the expansion be the only feasible option, how would the town of Essex guarantee that there is no impact on the property values of the neighbouring residences?

Any expansion/upgrade to the existing facility will be carried out in accordance with MECP standards for environmental impacts. Potential impacts on social and natural environment will be identified as part of this study. We will continue to consult with the MECP, the MNRF, DFO and the ERCA to determine if special measures or additional studies will be necessary to preserve and protect sensitive features. The ESR report will describe proposed mitigation measures and how project planning will protect.

I look forward to the opportunity to learn more about the next phases in this project and hope that a solution can be developed that balances the concerns of the current residents rather than catering to potential future residents and developers. Please feel free to contact me should you have any further information or questions.

At this time, we have not yet identified and evaluated any technical alternatives for the lagoon expansions/upgrades. Upon the completion of Phase 2, we will move on to Phase 3. Discussions of improving the efficiency of the existing facility will take place in Phase 3 of the Class EA process when the alternative design solutions are identified. Phase 3 study will be presented at PIC No.2 next year.

Should you wish to discuss this study further or require additional information, we are available to meet with them in person or virtually at their convenience.

Sincerely,
Allison Campbell
431 Lake Crest Ct.
Harrow, ON
N0R 1G0

Sent from Mail for Windows

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PUBLIC INFORMATION CENTRE
COMMENT FORM

COLCHESTER SOUTH SEWAGE WORKS EXPANSION

The southern portion, or Urban Area, of Colchester South Community of the Town of Essex is serviced with a communal sewage system. Wastewater within this service area is collected by sanitary sewer systems and then conveyed to the existing Colchester South wastewater treatment facility for treatment. The Town has been realizing increasing wastewater servicing demands from significant development pressures within the community area. To ascertain this impact, the Town has initiated a Class Environmental Assessment (Class EA) to expand the existing Colchester South Sewage Works.

This study will include an opportunity and problem statement, evaluation of alternative solutions, evaluation of alternative design concepts, and recommendations for the preferred design. This assessment will include consideration for potential environmental, social, and economic impacts as well as measures to mitigate adverse impacts.

THANK YOU

Public participation will form an integral part of this Class EA study to ensure that the concerns of the public and affected groups within the study area are identified, documented, and assessed. Thank you for your interest in this project and attendance at this public information centre.

Copies of the Public Information Centre material are available on the Town's project website below:

https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

Please return your completed comment form on or before November 30th, 2022, to:

Hannah Rindlisbacher, E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 226-268-3033
hannah.rindlisbacher@stantec.com

Attention: Hannah Rindlisbacher
Stantec Consulting Ltd.
2555 Ouellette Avenue, Unit 100
Windsor ON
N8X 1L9

Stantec

COLCHESTER SOUTH SEWAGE WORKS EXPANSION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the Colchester South Sewage Works Expansion:

NAME Alyssa Russell

EMAIL ADDRESS alyssa_inverarity@hotmail.com

TELEPHONE NO. (519-990-8306

DATE Dec 5, 2022 SIGNATURE

Stantec

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From:	McBeth, David
To:	Angela Ritchie; Li, Jian
Cc:	Kevin Ritchie; Bondy, Sherry
Subject:	RE: Colchester South Sewage Works Expansion ~ Comments and Concerns
Date:	Monday, November 7, 2022 12:23:18 PM
Attachments:	essex_logo_colour_d7c21922-3a94-4fef-bf7a-752e7ad9fdb1.png 058_line_9bae9502-1e3a-48a3-ba5e-34ed9cd44185.png 003_sm_fb_a1669113-305d-4ecf-bbc8-c006dd7ddaf7.png 003_sm_in_610e655e-a302-4d87-ae26-377ce3e93934.png 003_sm_twitter_ac632f2d-acfa-45dc-872a-d62866a18eee.png 003_sm_v2_e868968d-ddeb-43d2-9d96-466d86bfd691.png 003_sm_insta_f5d67e1c-f986-446b-a9ce-327354141ccb.png emailsignature_localveteran_short_dfb21afa-ee0a-4c1a-9b17-7e3f8315add0.png Municipal Class Planning and Design Process A.2 (FLOWCHART) NEW JUNE 2021.pdf Companion Guide rev 02 December 2018.pdf

---

Angela,

Please the response below from both the Town and Stantec to your questions, requests and summary of concerns:

1. **Please send copy of the reports used to generate the information boards at the presentation.**

   The information boards at the presentation were developed in accordance with guidelines from the necessary regulatory agencies including the Municipal Class Environmental Assessment (MCEA) Class EA process and the Ministry of Environment, Conservation and Parks (MECP) sewage design guidelines. The Environmental Study Report (ESR) will be prepared to document the planning, design, and consultation process for the project. The ESR is to be placed on the public registry for scrutiny by review agencies and the public.

2. **Please confirm where we are at in this Municipal Class EA Planning and Design process. My understanding is that you are at the end of Phase 2. It was mentioned several times that we are early in the process, yet you seem to have narrowed down the options to 2 without consulting adjacent property owners.**

   The Class EA for municipal projects follows a five-phase planning process that can be summarized as follows:

   Phase 1 – Identification of the problem

   Phase 2 – Identification of alternative solutions to the problem, consultation with review agencies and the public, selection of the preferred solution, and identification of the project as a Schedule A, A+, B or C activity.

   Phase 3 – Identification of alternative design concepts (technical alternatives) for the preferred solution, evaluation of the alternative designs and their impacts on the environment, consultation with review agencies and the public and selection of the preferred design.

   Phase 4 – Preparation of an Environmental Study Report (ESR) to document the planning, design and consultation process for the project. The ESR is placed on the public registry for scrutiny by review agencies and the public.

   Phase 5 – Final design, construction and commissioning of the selected technical alternative. Monitoring of construction for adherence to environmental provisions and commitments.

   We are currently still in Phase 2 and collecting input from the public and review agencies in order to determine the preferred solution.

   We held a Public Information Centre (PIC) as a part of Phase 2 of the standard class EA process to present seven different alternative solutions and based on technical suitability, social, natural environment, and economic factors, it was narrowed down to two. The purpose of a PIC is to consult with interested parties. Although our initial evaluation identified two options as favourable, this PIC was an opportunity for the pubic to provide feedback and comments on the alternatives presented.

3. **Upon consulting the Municipal Class EA Planning and Design Process, it appears that you could have had Discretionary Public Consultation in Phase 1. What was the thinking in choosing to not include the Public in Phase 1 before you narrowed the options down to 2?**

   A Notice of Study Commencement was posted on the Town's website, the Town's social media and published in the

Harrow News. The intention of the Notice of Study Commencement is to present the problem statement/opportunity statement and solicit comments from any parties that wish to provide input, as stated in the Notice of Study Commencement.

Phase 1 – Identification of the problem

Phase 2 – Identification of alternative solutions to the problem, consultation with review agencies and the public, selection of the preferred solution, and identification of the project as a Schedule A, A+, B or C activity.

Phase 1 information was carried forward into Phase 2 which reflects what was presented at the PIC.

4. **Could we see a copy of your Consultation Plan Outline for Mandatory Activities? I would like to understand the methodologies.**

   The Class EA study is in accordance with guidelines from the necessary regulatory agencies including the Municipal Class Environmental Assessment (MCEA) Class EA process and the Ministry of Environment, Conservation and Parks (MECP) sewage design guidelines.

   Please see section A.3.5.1 of the Municipal Class Environmental Assessment – Companion Guide attached which includes the Consultation Plan Outline for Mandatory Activities which was followed for this Class EA.

5. **Who were the stakeholders identified in this process? Why were adjacent property owners not included as stakeholders?**

   The list of stakeholders included Federal, Provincial, and Municipal agencies, First Nations communities, Emergency Services, Utility companies the MECP, MTCS, ERCA and several other ministries. The list of stakeholders is constantly updated based on feedback from the public and notification of any additional interested parties. In order to solicit responses from individual parties the Notice of Study Commencement and the Notice of PIC were posted on the Town's website, the Town's social media and published in the Harrow News and the public is still able to provide feedback through the Town's website up until November 30th, 2022. Please see the following link:
   https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx
   We will be delivering physical letters of the Notice of PIC No.2 to the adjacent property owners. Any other interested parties are encouraged to contact us to be added to the project mailing list and email distribution list.

6. **Please send a copy of the Comments received so far by the included Stakeholders with respect to the preferred 2 options identified – ERCA, MOE, Planning Dept.**

   The comments received by the included stakeholders with respect to the two favourable alternatives will be included in public consultation section of the Environmental Study Report (ESR) which will be available to the public in Phase 4.

7. **The legislation suggests that you anticipate "hot button/contentious issues". What were the issues identified thus far in the process?**

   The Notice of Study Commencement and the Notice of PIC has been issued to solicit comments and concerns from the public that will be considered as part of this study. The impact of the proposed work on the local community is one of the main criteria to be considered in the evaluation process. The existing Colchester South Sewage Works was constructed in the early 1980s. Upgrades to the existing facility are necessary to improve performance and operating conditions to meet current standards.

8. **Were any stakeholders consulted in the development of the criteria for measurement of impacts of your options? Who did you include? What were their comments?**

   The Class EA study is in accordance with guidelines from the necessary regulatory agencies including the Municipal Class Environmental Assessment (MCEA) Class EA process and the Ministry of Environment, Conservation and Parks (MECP) sewage design guidelines.

   A.4.2 SCHEDULE C ENVIRONMENTAL STUDY REPORT (municipalclassea.ca)

On the MCEA website the Class EA Planning Process can be found, under Part A, section A.4.2 SCHEDULE C ENVIRONMENTAL STUDY REPORT, 'Chapter 3 – Alternative Solutions' states the following:
The alternative solutions considered should be detailed in this chapter. Details of the following should be provided:

- a description of the existing environment, i.e. natural, social, cultural economic and technical.
- the extent to which the alternative solutions resolve the problem.
- the advantages and disadvantages of the alternative solutions.
- the effects of the alternative solutions on the environment.
- the decision-making process used to select the preferred solution.

Therefore, in the Phase 2 evaluation of alternative solutions, only the impacts on the environment are required. It is not until the Phase 3 evaluation of alternative designs, that the effects on the physical, natural, social, cultural, economic and technical environments of each of the alternative designs is required.

The PIC presentation was circulated to all stakeholders, and they are welcome to comments make suggestions on any aspect of the project including evaluation criteria.

9. **What were your criteria for measuring impact? For example, the term negligible was used for the expansion's Social impact. As a stakeholder/adjacent property owner, negligible is not the term I would use. How was this determined?**

The criteria for measuring impact were outlined in slide #9 of the PIC slideshow. Each point within the criteria were measured relative to one another. The social impact was evaluated based on the following:

- Impact to archaeological, built heritage, and cultural heritage
- Noise, vibration, odour, or air pollution emissions
- Permanent changes or impacts to society / community
- Development policies and agreements
- Ability to increase development and improve housing supply

The impact of the proposed work on archaeological, built heritage and cultural heritage is negligible compared to the existing conditions for Alternative 7. The proposed work involves an upgrade/expansion to the existing wastewater treatment plant.

In terms of the impact of noise, vibration, odour or air pollution emissions, the existing wastewater treatment would be expanded to comply with the MECP emission standards. Mitigation measures will be implemented so that the impact of the proposed work is negligible to the existing conditions.

In terms of permanent changes or impacts to society/community, the Alternative 7 for expansion of the existing facility will have less impact on the local community as opposed to Alternative 6. Mitigation measures will be taken to minimize the impact of the proposed work on the local community.

Regarding development policies and agreements, the development is still being reviewed by the Town.

Therefore, the term negligible was used because in comparison to Alternative 6, Alternative 7 would have overall significantly less social impact and the necessary mitigations measures will be taken to ensure the social impact is negligible.

10. **Where is this process going next? I see the option to go back to Phase 1 after Public Consultation. The lack of identifying and including adjacent property owners as Stakeholders in this process, I believe warrants taking a step back to properly follow the Municipal Class EA Planning and Design Process and include ALL relevant stakeholders.**

The main purpose of Phase 1 is to identify a problem or opportunity statement; therefore, it is not necessary to go back to Phase 1. Phase 2 includes identification and evaluation of alternative solutions to the problem, identification of environmental impacts of the alternative solutions, consultation with the public and review agencies, selection of the preferred solution and determination of the project schedule as a Schedule A, A+, B or C activity. This project is identified as a Schedule 'C' Class EA.

The PIC held on October 26th was held to include ALL relevant stakeholders and identify any additional interested parties.

All stakeholders are now encouraged to provide comments and feedback on the information presented at this open house and this will be taken into consideration before finalizing the preferred solution in completion of phase 2 as shown in the attached Municipal Class EA Planning and Design Process flow chart.

The next steps in this process will include reviewing all comments and public feedback received on the evaluation of alternative solutions and selecting the preferred solution. Upon completion of selecting the preferred solution we will move into Phase 3 which includes identification and evaluation of alternative design concepts, identification of environmental impacts and mitigating measures with respect to the design concepts, further consultation with the public and review agencies, and selection of the preferred design.

Another PIC will be held to present the alternative design concepts, it is anticipated that this will occur in 2023. We encourage stakeholders to provide comments throughout the entire process.

11. **How does this specific Municipal Class EA project fit into the Official Plan for development and infrastructure requirements for southern Essex County?**

The Municipal Class EA for the proposed work will be consistent with the current Official Plan of the Town of Essex.

12. **How will you be notifying adjacent property owners with respect to this Municipal Class EA Planning and Design process going forward?**

Anyone who provided their email address or contact information will be included in the stakeholder distribution list, in addition we will be hand delivering future notices of PIC to residents living near the Colchester WWTP, as it was requested at the PIC.

Summary of Concerns

- **Failure to advise the adjacent property owners of the undertaking of a Municipal Class EA Planning and Design process - The neighbourhood most directly impacted should have been included in Phase 1 however were not even informed about this Proposed Expansion project.**

  The Notice of Study Commencement was posted on the Town's website, the Town's social media and published in the Harrow News. The intention of the Notice of Study Commencement is to present the problem statement/opportunity statement and solicit comments from any parties that wish to provide input, as stated in the Notice of Study Commencement.

- **Failure to notify adjacent property owners of Public Consultation Meeting - We found out by word of mouth about the Phase 2 Public Hearing the same day it was held. Again, as an adjacent property owner, we should have been included in Phase 1. We arrived at the Public Consultation and to our surprise we found out that the process is already towards the end of Phase 2. And to further discover that you have already narrowed down to 2 Preferred Solutions, one directly impacting our property is concerning.**

  The Notice of Public Information Centre was posted on the Town's website, the Town's social media and published in the Harrow News to notify any interested parties.

- **Failure to include adjacent property owners as Stakeholders in the Municipal Class EA Planning and Design process.**

  The Notice of Public Information Centre was posted on the Town's website, the Town's social media and published in the Harrow News to notify any interested parties. Any additional parties that expressed interest in the project were added to the distribution list for future notices.

- **Failure to consult adjacent property owners with respect to Hot Button/Contentious issues. I did not see anything in your presentation that listed out anticipated issues.**

  The purpose of the PIC is to solicit comments and concerns regarding hot button/contentious issues raised by the public which will be considered in this study.

- **Failure to consult adjacent property owners on the current impacts – noise, smell, on the adjacent neighbours. These are impacts currently felt by adjacent property owners; an expansion would exacerbate the current situation. You did**

not ask us about our current experiences, instead identified impacts of expansion in your presentation as "Negligible". How do you know this? Did you know that we can hear the plant? Did you know that there is a constant "hum" in our neighbourhood? No .... you did not ask.

The potential impact on the surrounding area is included in the evaluation of alternative solutions. Mitigation measures will be implemented so that the impact of the proposed work is negligible.

- **It appears that the 2 preferred options do not address long term Residential Development plans in this area, only the Dunn Rd Development. The infrastructure requirements for long term Development should be addressed in this process, not specific to one development. Are you going to expand this plant again when you receive another development proposal? Is a band-aid strategy the best solution?**

  In Phase 3, identification, and evaluation of alternative design solutions, we will be using historical population growth data, the Town of Essex Official Plan, and consideration of future development growth to generate the most accurate estimate of population growth and future wastewater service demands in the area for the next 20 years.

- **No discussion of improving the efficiency of the existing facility seemed to be part of the process. What are these options? Cleaning out the existing ponds? Enhancing the current system with new technology?**

  Discussions of improving the efficiency of the existing facility will take place in Phase 3 of the Class EA process when the alternative design solutions are identified. The options have not yet been determined as we are still in Phase 2.

- **What are the alternative/preferred technologies for Sewage and Wastewater Treatment in Ontario? Why were these not explored as long term solutions in the overall Infrastructure Plan for Southern Essex County. Or were they explored? And if they were, why were they ruled out? We would have a better understanding if we had been included in this process from Phase 1.**

  The alternative/preferred technologies for Sewage and Wastewater Treatment in Ontario is not part of the Phase 1 Class EA process. We look further into these technologies in Phase 3 of the Class EA when the alternative design solutions are identified. Design technologies cannot be considered until a preferred solution is selected.

- **No acknowledgement of the Wetlands or the 100 year flood line relative to the proposed expansion. We were told ERCA had <u>no concerns</u>. I find this unlikely and would like to know what they actually had to say. I would expect there is a report on this somewhere and it should have been available at the meeting, or a representative of ERCA be available for questions.**

  ERCA was notified of the project commencement as well as the information presented at the PIC. It was not stated that ERCA had no concerns regarding the Wetlands or the 100-year flood line. ERCA provided a response to the PIC material and has notified us of potential permits and approvals required for any modifications to the Wetland District. ERCA's comments will be included in the ESR which will be available for public review in Phase 4.

- **By all appearances, cost was the deciding factor in narrowing down your options.**

  The alternative solutions were evaluated based on four criteria which consist of the effect on social, natural, economic, and technical environments.

- **This process has an overall appearance of already having a preferred conclusion and an attempt to fast-track this expansion with minimal public input is in play.**

  The Class EA study is in accordance with guidelines from the necessary regulatory agencies including the Municipal Class Environmental Assessment (MCEA) Class EA process and the Ministry of Environment, Conservation and Parks (MECP) sewage design guidelines.

  Please see section A.3.5.1 of the Municipal Class Environmental Assessment – Companion Guide attached which includes the Consultation Plan Outline for Mandatory Activities which was followed for this Class EA.

  The preferred solution will be identified at the end of Phase 2 after all comments are received. The public is still able to provide feedback through the Town's website up until November 30th, 2022.

Attached:
Municipal Class EA Planning and Design Process Flow Chart
Companion Guide for the Municipal Class Environmental Assessment Manual

Thank you.

Regards,

David McBeth
Manager, Capital Works & Asset Management | Infrastructure Services
P: 519.776.7336 ext. 1113 | F: 519.776.8811
E: dmcbeth@essex.ca | www.essex.ca
33 Talbot Street S. Essex, ON N8M 1A8

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From: Angela Ritchie <angelaritchie247@gmail.com>
Sent: Wednesday, November 2, 2022 10:37 AM
To: jian.li@stantec.com; McBeth, David <dmcbeth@essex.ca>
Cc: Kevin Ritchie <kevin.d.ritchie@gmail.com>; Bondy, Sherry <sbondy@essex.ca>
Subject: Colchester South Sewage Works Expansion ~ Comments and Concerns

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Thank you for your time at the meeting.

I have taken the time to digest the information you provided at the public meeting last week and reviewed the relevant legislation. Based on this, I have complied a list of questions, requests for documents and a Summary of Concerns.

1. Please send copy of the reports used to generate the information boards at the presentation.
2. Please confirm where we are at in this Municipal Class EA Planning and Design process. My understanding is that you are at the end of Phase 2. It was mentioned several times that we are early in the process yet you seem to have narrowed down the options to 2 without consulting adjacent property owners.
3. Upon consulting the Municipal Class EA Planning and Design Process, it appears that you could have had Discretionary Public Consultation in Phase 1. What was the thinking in choosing to not include the Public in Phase 1 before you narrowed the options down to 2?
4. Could we see a copy of your Consultation Plan Outline for Mandatory Activities? I would like to understand the methodologies.
5. Who were the stakeholders identified in this process? Why were adjacent property owners not included as stakeholders?
6. Please send a copy of the Comments received so far by the included Stakeholders with respect to the preferred 2 options identified – ERCA, MOE, Planning Dept.
7. The legislation suggests that you anticipate "hot button/contentious issues". What were the issues identified thus far in the process?
8. Were any stakeholders consulted in the development of the criteria for measurement of impacts of your options? Who did you include? What were their comments?
9. What were your criteria for measuring impact? For example, the term negligible was used for the expansion's Social impact. As a stakeholder/adjacent property owner, negligible is not the term I would use. How was this determined?
10. Where is this process going next? I see the option to go back to Phase 1 after Public Consultation. The lack of identifying and including adjacent property owners as Stakeholders in this process, I believe warrants taking a step back to properly follow the Municipal Class EA Planning and Design Process and include ALL relevant stakeholders.
11. How does this specific Municipal Class EA project fit into the Official Plan for development and infrastructure requirements for southern Essex County?
12. How will you be notifying adjacent property owners with respect to this Municipal Class EA Planning and Design process

going forward?

Summary of Concerns:

-

- Failure to advise the adjacent property owners of the undertaking of a Municipal Class EA Planning and Design process - The neighbourhood most directly impacted should have been included in Phase 1 however were not even informed about this Proposed Expansion project.
- Failure to notify adjacent property owners of Public Consultation Meeting - We found out by word of mouth about the Phase 2 Public Hearing the same day it was held. Again as an adjacent property owner, we should have been included in Phase 1. We arrived at the Public Consultation and to our surprise we found out that the process is already towards the end of Phase 2. And to further discover that you have already narrowed down to 2 Preferred Solutions, one directly impacting our property is concerning.
- Failure to include adjacent property owners as Stakeholders in the Municipal Class EA Planning and Design process.
- Failure to consult adjacent property owners with respect to Hot Button/Contentious issues. I did not see anything in your presentation that listed out anticipated issues.
- Failure to consult adjacent property owners on the current impacts – noise, smell, on the adjacent neighbours. These are impacts currently felt by adjacent property owners; an expansion would exacerbate the current situation. You did not ask us about our current experiences, instead identified impacts of expansion in your presentation as "Negligible". How do you know this? Did you know that we can hear the plant? Did you know that there is a constant "hum" in our neighbourhood? No .... you did not ask.
- It appears that the 2 preferred options do not address long term Residential Development plans in this area, only the Dunn Rd Development. The infrastructure requirements for long term Development should be addressed in this process, not specific to one development. Are you going to expand this plant again when you receive another development proposal? Is a band-aid strategy the best solution?
- No discussion of improving the efficiency of the existing facility seemed to be part of the process. What are these options? Cleaning out the existing ponds? Enhancing the current system with new technology?
- What are the alternative/preferred technologies for Sewage and Wastewater Treatment in Ontario? Why were these not explored as long term solutions in the overall Infrastructure Plan for Southern Essex County. Or were they explored? And if they were, why were they ruled out? We would have a better understanding if we had been included in this process from Phase 1.
- No acknowledgement of the Wetlands or the 100 year flood line relative to the proposed expansion. We were told ERCA had no concerns. I find this unlikely and would like to know what they actually had to say. I would expect there is a report on this somewhere and it should have been available at the meeting, or a representative of ERCA be available for questions.
- By all appearances, cost was the deciding factor in narrowing down your options.
- This process has an overall appearance of already having a preferred conclusion and an attempt to fast-track this expansion with minimal public input is in play.

I would like to see this Municipal Class EA Planning and Design process for the Colchester South Area take a step back and look at the bigger picture.

- Long term Development and Infrastructure planning
- Alternative technologies
- Waste Water reduction programs
- Great Lakes Water Quality Planning
- Efficiencies in Existing Serving

I look forward to receiving the requested information and your response.

Sincerely,
Angela & Kevin Ritchie
441 Lake Crest Cr
Harrow, ON
N0R 1G0
Angelaritchie247@gmail.com

From: Li, Jian
To: Amy Fitzgerald
Cc: Sean Demers; sandrajfitzgerald1950@gmail.com; Bondy, Sherry; dmcbeth@essex.ca; Rindlisbacher, Hannah; jmatyi@essex.ca
Subject: RE: 1656200266 Municipal Class Environmental Assessment (EA) for Colchester South Sewage Works Expansion
Date: Friday, November 11, 2022 11:00:42 AM

Hi Prof. Fitzgerald,

Please be advised that this study is being carried out in accordance with the following Municipal Class Environmental Assessment process :

Phase 1 – Identification of the problem
Phase 2 – Identification of alternative solutions to the problem, consultation with review agencies and the public, selection of the preferred solution, and identification of the project.
Phase 3 – Identification of alternative design concepts (technical alternatives) for the preferred solution, evaluation of the alternative designs and their impacts on the environment, consultation with review agencies and the public and selection of the preferred design.
Phase 4 – Preparation of an Environmental Study Report (ESR) to document the planning, design and consultation process for the project. The ESR is placed on the public registry for scrutiny by review agencies and the public.
Phase 5 – Final design, construction and commissioning of the selected technical alternative. Monitoring of construction for adherence to environmental provisions and commitments.

We are currently still in Phase 2 and collecting input from the public and review agencies in order to determine the preferred solution.

At this time, we have not yet identified and evaluated any alternatives for the lagoon expansions/upgrades. Your concerns will be certainly considered during the upcoming evaluation.

Upon the completion of Phase 2, we will move on to Phase 3, and evaluate how existing sewage works can be upgraded/expanded to accommodate the proposal development as well as future other development and population growth in the area serviced by existing sewage works. Phase 3 study will be presented at PIC No.2 next year.

Regards,

Jian Li Ph.D., P.Eng., PE
Principal & Business Centre Practice Leader, Water

Direct: 519 966-2250
Mobile: 519 562-7541
jian.li@stantec.com

Stantec
2555 Ouellette Ave
Windsor ON N8X 1L9

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From: Amy Fitzgerald <afitz@uwindsor.ca>

Sent: Friday, November 11, 2022 10:10 AM
To: Li, Jian <jian.li@stantec.com>
Cc: Sean Demers <seanrdemers@gmail.com>; sandrajfitzgerald1950@gmail.com; Bondy, Sherry <sbondy@essex.ca>; dmcbeth@essex.ca; Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>; jmatyi@essex.ca
Subject: RE: 1656200266 Municipal Class Environmental Assessment (EA) for Colchester South Sewage Works Expansion

Good morning,

Thank you very much for your response. I certainly understand that due to the recent/anticipated increased development it is necessary to improve infrastructure. I do, however, have a question I'm hoping you can answer: to what extent have you and the town considered developing a second lagoon at a separate site? I reviewed the power point slides from the public information session but there wasn't much information in this regard. I understand doing so would be more costly, however, as I'm sure you can understand there are concerns with expanding the present lagoon given the proximity to homes and due to potential environmental impact.

Kind regards,
Amy Fitzgerald

Amy J. Fitzgerald, PhD. (she/her)
Professor
Department of Sociology & Criminology
Great Lakes Institute for Environmental Research (GLIER)
University of Windsor

Personal website: https://amyfitzgerald.wordpress.com/

The University of Windsor sits on the traditional territory of the Three Fires Confederacy of First Nations, which includes the Ojibwa, the Odawa, and the Potawatomi.

From: Li, Jian <jian.li@stantec.com>
Sent: November 9, 2022 6:15 PM
To: Amy Fitzgerald <afitz@uwindsor.ca>
Cc: Sean Demers <seanrdemers@gmail.com>; sandrajfitzgerald1950@gmail.com; Bondy, Sherry <sbondy@essex.ca>; dmcbeth@essex.ca; Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: 1656200266 Municipal Class Environmental Assessment (EA) for Colchester South Sewage Works Expansion

Dear Prof. Fitzgerald,

Thank you for the response regarding the Municipal Class EA for Colchester South Sewage Works

Expansion.

Prior to the 1st Public Information Centre (PIC) held on October 26, the PIC notice was posted on the Town's website and published in the Harrow News. Although the PIC was held on October 26, the public is still able to review the PIC posters and provide feedback through the Town's website up until November 30th, 2022. Thus, we delivered physical letters of the Notice to the adjacent property owners.

In terms of your question "In what direction are you considering expanding the lagoon?", we will be holding PIC No.2 next year. The purpose of PIC No.2 is to consult with the regulatory agencies and the public to review how to upgrade/expand the existing lagoon to meet proposed development and future growth in the area. The impact of the proposed lagoon upgrades/expansion on the local community is one of the main criteria to be considered in the evaluation process. The preferred alternative for the lagoon upgrades/expansion is to be reviewed and identified based on feedback from the regulatory agencies and the public. Any upgrades/expansion to existing lagoon will have to comply with the requirements specified by the Ministry of Environment, Conservation and Parks (MECP), the Essex Region Conservation Authority (ERCA), and other regulatory agencies.

I trust this answers your questions. Should you wish to discuss this study further or require additional information, we are available to meet with you in person or virtually at your convenience.

Respectively yours,

Jian Li Ph.D., P.Eng., PE
Principal & Business Centre Practice Leader, Water

Direct: 519 966-2250
Mobile: 519 562-7541
jian.li@stantec.com

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From: Amy Fitzgerald <afitz@uwindsor.ca>
Sent: Wednesday, November 9, 2022 7:48 AM
To: dmcbeth@essex.ca; Li, Jian <jian.li@stantec.com>
Cc: Sean Demers <seanrdemers@gmail.com>; sandrajfitzgerald1950@gmail.com; Bondy, Sherry <sbondy@essex.ca>
Subject: Colchester South Expansion

Good morning,

We received a notice yesterday regarding "Phase 2 Public Consultation, Class Environmental Assessment, Colchester South Sewage Works Expansion." It's a shame that we did not receive it before the public information session that was apparently held last month, as we (and I suspect most, if not all, of our neighbours) were unaware of the proposal and would have appreciated an

opportunity to ask questions.

I do have a question that I'm hoping you'll be able to address. In what direction are you considering expanding the lagoon? I read through the materials on the Essex website but cannot locate any specific information regarding in what direction(s) it would be expanded. It is difficult to provide public feedback without receiving more specific information. For instance, expanding East would obstruct the road and contravene the necessary set-back for the houses on Wright Road (where I live). Expanding South poses the same problem for the houses on Erie Aire. Expanding North would require removing trees and wildlife habitat. As well, there is a historic cemetery in the woods that ought not be disturbed. Finally, expanding West would also require removal of trees and habitat, and I'm sure the houses on that beach road would have concerns.

As I'm sure you can appreciate, it is difficult to provide meaningful feedback without more information.

Thank you in advance for your assistance,
Amy Fitzgerald

Amy J. Fitzgerald, PhD. (she/her)
Professor
Department of Sociology & Criminology
Great Lakes Institute for Environmental Research (GLIER)
University of Windsor

Personal website: https://amyfitzgerald.wordpress.com/

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Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome

From: Rindlisbacher, Hannah
To: M.T
Cc: Li, Jian; McBeth, David
Subject: RE: Colchester South Sewage works Expansion
Date: Monday, January 9, 2023 3:28:00 PM

Good afternoon Dr. Tabib,

Thank you for providing your concerns in writing. Please see our response to your comments below in blue font.

Thanks,

Hannah Rindlisbacher B.A.Sc., E.I.T., LEED Green Associate
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

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From: M.T <rinad1003@gmail.com>
Sent: Tuesday, December 27, 2022 7:35 PM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Cc: Li, Jian <jian.li@stantec.com>; McBeth, David <dmcbeth@essex.ca>
Subject: Colchester South Sewage works Expansion

Dear Hannah,
In reference to the previous discussion at Stantec on November 14th regarding the Colchester South Sewage works Expansion, we would like to know the following:
How can the abutting landowners be part of the study and how can the land owners be informed about the impact of the future Sewage site expansion on the abutting lands to the north and to the west and their future developability.
The Class Environmental Assessment (EA) for this project is being carried out in accordance with guidelines from the necessary regulatory agencies including the Municipal Class Environmental Assessment (MCEA) Class EA process.
Public Information Centres (PICs) are hosted to solicit comments from the public as part of this Class EA. All interested residents and stakeholders, including abutting landowners are welcome to attend the PICs and provide feedback. You have been added to the distribution list for project notices. An Environmental Study Report (ESR) will be prepared to document the planning, design, and consultation process for the

project. Once the ESR is placed on the public registry, information on the impact of the sewage works upgrades/expansion will be available for public review.
We would also like to be aware of the criteria considered to minimize the effect on the abutting developable lands and what can Stantec do to get into an outcome that is equal to or better than the current situation with respect to noise and Odour.
Stantec's design alternatives are to be evaluated based on the Ministry of Environment, Conservation and Parks (MECP) sewage design guidelines, the Town's official plan and bylaws, and other applicable guidelines. Mitigation measures are to be taken to minimize impact of the proposed expansion on the surrounding areas, particularly existing residential houses.
Explore all the viable expansion solutions Including SBR, Membrane separation or any other filtering mechanism to minimize the Odour impact on the developability of the abutting lands despite the cost factor and would like to express that we could be part of the solution as well to help with the cost for the ideal solution.

We also would like Stantec and the Town to be aware that it is important that the expansion options address not only the capacity constraints but also provide an environmentally sound solution that includes technology and on-site mitigation that will improve air quality (odour and noise) for the surrounding neighbourhood. This solution needs to protect both existing and future residents living nearby to the greatest degree possible. They should not be adversely affected by this sewage treatment facility expansion.

As per the MCEA Class EA process, the alternative design concepts are to be evaluated based on the impacts to the physical, natural, social, cultural, economic and technical environments, and presented to the public at the PIC spring 2023.

The feasible design solution alternatives will be evaluated based on four criteria which consist of the effect on social, natural, economic, and technical environments. Any expansion/upgrade to the existing wastewater treatment facility would comply with the MECP emissions standards for noise, vibration, odour and air pollution.
Your feedback and future update is highly appreciated.

Warm Regards.
M.Tabib
5199842228

On Fri, Dec 9, 2022 at 4:46 PM Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com> wrote:

> Good afternoon,
>
> Feel free to reply to this email with your written comments.

Thanks,

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

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From: M.T <rinad1003@gmail.com>
Sent: Friday, December 9, 2022 4:44 PM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Cc: Li, Jian <jian.li@stantec.com>; McBeth, David <dmcbeth@essex.ca>
Subject: Re: Colchester Lagoon

Dear Hannah,

I met with Mr. Jian Li on November 14th at your stantec office and we discussed our concerns regarding the potential impact on the abuttuing lands that we own. Unfortunately I didn't submit our concerns in writing prior to the deadline of November 30th however we raised them verbally at your office and I would like to get the opportunity to submit them either to you or to the Town if it's not too late. Please be mindful that we didn't receive any notification from the town regarding the public meeting which was scheduled by the end of October. Mr.David McBeth is included in this email and I will try to reach his office for further discussion as well.

Regards.
M.Tabib

On Tue, Nov 8, 2022 at 4:08 PM Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com> wrote:

> Good afternoon Tabib,
>
> Please see attached the slideshow from the Public Information Centre and the feedback form. These items can also be found on the project webpage at:

https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

The Class Environmental Assessment (EA) for municipal projects follows a five-phase planning process that can be summarized as follows:

Phase 1 – Identification of the problem

Phase 2 – Identification of alternative solutions to the problem, consultation with review agencies and the public, selection of the preferred solution, and identification of the project as a Schedule A, A+, B or C activity.

Phase 3 – Identification of alternative design concepts (technical alternatives) for the preferred solution, evaluation of the alternative designs and their impacts on the environment, consultation with review agencies and the public and selection of the preferred design.

Phase 4 – Preparation of an Environmental Study Report (ESR) to document the planning, design and consultation process for the project. The ESR is placed on the public registry for scrutiny by review agencies and the public.

Phase 5 – Final design, construction and commissioning of the selected technical alternative. Monitoring of construction for adherence to environmental provisions and commitments.

We are currently still in Phase 2 of this EA and collecting input from the public and review agencies in order to determine the preferred solution.

If you have any further questions after reviewing the project material, feel free to respond to this email or give me a call.

Thanks,

Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

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From: M.T <rinad1003@gmail.com>
Sent: Tuesday, November 8, 2022 2:01 PM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: Colchester Lagoon

Hello Hannah,

This is Tabib from windsor. I would like to reach out and possibly meet to discuss the work you are doing on the Colchester Sanitary lagoon as we own the abuuting properties.

Kindly exchange contact and advise with the preference to communicate please.

Thanks.
M.Tabib

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Rindlisbacher, Hannah

From: Li, Jian
Sent: Monday, November 14, 2022 12:44 PM
To: budzo@hotmail.ca
Cc: McBeth, David; Rindlisbacher, Hannah
Subject: 165620266 Municipal Class Environmental Assessment (EA) for Colchester South Sewage Works Expansion

Dear Mr. Kelly,

Thank you for your comments on the Municipal Class Environmental Assessment (EA) for Colchester South Sewage Works Expansion.

Please see my response (in blue font) to the comments in your email below.

Please contact the undersigned should you have any questions or require additional information.

Regards,

Jian

Jian Li, Ph.D., P.Eng., PE
Project Manager

Direct: 519 966-2250
Mobile: 519 562-7541

Stantec
2555 Ouellette Ave
Windsor ON N8X 1L9 CA



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From: Bud Zoman <budzo@hotmail.ca>
Sent: Friday, November 4, 2022 4:14 PM
To: jian.li@stantec.com; McBeth, David <dmcbeth@essex.ca>
Subject: Expansion of Colchester South sewage works

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For a variety of reasons I submit this to address issues surrounding the proposed expansion of the Colchester South sewage works.

First thing on my mind relates to a complete lack of notice for this project. As a resident situated in close proximity to this facility I find it offensive the 20+ residents living in this location were not notified,

personally. In fact, the ONLY reason I/we even knew about this was by rumour. Even at that we only learned of it just over a week before the public meeting took place.

Prior to the 1st Public Information Centre (PIC) held on October 26, the PIC notice was posted on the Town's website and published in the Harrow News. We also delivered physical letters of the Notice to the adjacent property owners on November 8. Although the PIC was held on October 26, the public including the adjacent residents is still able to review the PIC posters and provide feedback through the Town's website up until November 30th, 2022. Should any residents wish to discuss this study further or require additional information, we are available to meet with them in person or virtually at their convenience.

The study overview in the second bullet point states ... Present an evaluation of alternative solutions to accommodate increased development within the community. One question I ask is why? The second I ask on this point is why ONLY look at very short term options. Given the announcements of the Dunn Road development and the not so public knowledge of the LIPP Beach property (obviously to most for residential development) it should be clear by now that this area is ripe for residential development. Given those two considerations alone might make one at least consider looking at a bigger picture.

This study is initiated by the proposed development. However, this study will determine a long-term solution to accommodate increased wastewater servicing demands from the proposed development as well as other future developments and population growth in the Colchester South service area.

I am not against residential development provided the infrastructure supports the same but I believe the thinking on this capacity issues is short term, at best.
The capacity issues are to be addressed to meet the long-term wastewater servicing demand.

I'd like some feed back on some issues that have been circulating for years in this area.

- Information had been circulating for years the current facility was out of date. That it could not be expanded due to antiquated design features and it's open water (vs preferred closed container) set-up. We believed that the MOE had made that designation.
  We will review existing sewage works to identify the upgrades/expansion to meet the effluent criteria acceptable to the Ministry of Environment, Conservation and Parks (MECP).
- Can you advise on the current quality of the effluent being returned to Lake Erie NOW and what is to be expected in the future post any expansion.
  Existing sewage works is current operated to meet the effluent criteria specified in the Environmental Compliance Approval issued by the MECP. Any upgrades/expansion to existing sewage works will have to meet the effluent criteria set by the MECP.

- Can you advise what the outcome of and the realistic expectation of what was formally know as a 100 year old flooding event might have on the nearby residents currently and with expansion.
  The Colchester South service area is serviced by separate sanitary and storm sewer systems. This study involves sewage works consisting sanitary sewer system and lagoon facility. We are not aware of any flooding events caused by sewage works in this area. Stormwater management will be considered for the proposed work, any potential negative impact of the proposed work on stormwater management will be mitigated.

On Page 4 of the handout it speaks of 'socio-economic and environmental benefits as a result of a proposed residential development along County Road 50 from Dunn to Wright. In the paragraph it clearly states (should this come to fruition) it would exceed the capacity of the current Colchester South Sewer work. I accept that will be the case but have objections to the focus of the study and the short term solutions proposed.

This study is triggered by the proposed development that is not in the original area serviced by the existing sewage works. However, this study will determine a long-term solution to accommodate increased wastewater servicing demands from the proposed development as well as other future developments and population growth in the Colchester South service area.

What is obvious, given the data presented is should Colchester South residential units go forward the capacity of the CWWTP would be of concern. I note that to this point in the hand out there is no mention of the LiPPS Beach pending sale.
This study will determine a long-term solution to accommodate increased wastewater servicing demands from the proposed development as well as other future developments and population growth in the Colchester South service area

On the opportunity statement the last point states 'This study will evaluate design solutions and concepts to accommodate wastewater flows from this development'. Assuming this was a statement only about the DUNN road project (need for expansion of CWWTP) why are there add on capacity issues related to the study in the document?
This study is triggered by the proposed development that is not included in the original area serviced by the existing sewage works.

In the Alternative Solutions the study was undertaken to identify current and future needs for waste water. Under the Social group it identifies issues such as Noise, Vibration, Odour, or air pollution emissions. I can advise that on occasion the smell emitting from this facility is not pleasant.
Any expansion/upgrade to the existing facility will be carried out to comply with MECP standards for noise, vibration, odour or air pollution emissions.

Again I believe that 'other' alternatives were not considered and I struggle to understand why. With the projected growth of Essex County would it not be in the Town of Essex best interest to look beyond managing this issue with a 20 year outlook? Even given that, with no additional growth won't the current facility will still be outdated in 20 years. So, why not look beyond that and plan for a future. A future where the CWWTP can accommodate growth for 50 years with expansion capabilities (additional land area).
This study will determine a long-term solution to accommodate increased wastewater servicing demands from the proposed development as well as other future developments and population growth in the Colchester South service area

I suggest the a/m because in the Alternative Solutions Overview I read that:
A-1 Not even a consideration given announcements
A-2 Again, given announcements and housing issues not a consideration
A-3 Not sure what this means
A-4 Speaks only and specifically to expansion of current WW facility
A-5 Adds a 'modern' solution to a proposed residential development and also 'contains' the untreated sewage in tanks not susceptible to flood plain issues
A-6 Seems this was written to address A-5 and again it is not in a flood plain
A-7 Very short term solution at best. Adding capacity to a plant in a flood plain, open sewers that on occasion irritate local residents 'trapped' in a bowl of sorts due to tree lines on three sides (don't cut them down we love them) and subjects them to the vibration of the pumps mostly in the winter when the ground is frozen.

The Alternative Solutions page is even more concerning to me.

It seems that EVERYTHING is related to cost issues. I acknowledge that there has to be something done to accommodate growth but why is the study ONLY looking at SHORT TERM solutions and using COSTS as a basis from which to propose solutions. Given the Federal Government and Provincial Government concerns about environment would it be advisable to at least put some consideration into building a new, modern and efficient facility. One that could even reduce the effluent deposits back into a Lake that not long ago was considered as 'dying'?

The focus of this section seems directly related to 'growth'. Bullet points 1-3 speak almost directly to that issue.

Point 4 virtually eliminates any opportunity to dredge out the existing facility of waste (which I understand was done last year) and actually speaks to the problem with the existing design commenting that sludge removal would exceed the design standards of the existing facility.

Point 5 again speaks directly to costs. Is this really OR should it be the MAJOR consideration to an issue that involves water standards and environmental issues?

Point 6 speaks to establishing an independent WWTP within the area of growth as proposed. While this is a much preferred option in my opinion verses the expansion of the Colchester Treatment Facility and one that is environmentally superior to any within this proposal it is, in MY humble opinion it also VERY short term thinking.

Point 7 Speaks to the expansion of the Colchester facility. Of the two options, the two ONLY options considered for this report.

The alternative solutions have been evaluated based on technical suitability, social, natural environment, and economic factors. The evaluation process has been carried out in accordance with the standard Municipal Class Environmental Assessment. Although our initial evaluation identified two options for further evaluation, and Alternative 7 appears to be favourable to accommodate increased wastewater servicing demands from the proposed development as well as other future developments and population growth in the Colchester South service area. We are currently still in Phase 2 and collecting input from the public and review agencies in order to determine the preferred solution.

ALTERNATIVE SOLUTIONS:

At the onset I'd suggest that the variety of alternative solutions should be considered.

I do note that the use of verbiage in the report points strongly to the likelihood that the only viable solution from the engineers point of view is to expand the Colchester facility.

I acknowledge that seeking alternative solutions (to a problem the Town is not **currently** facing) is not desirable nor is it inexpensive or easy. Further the easiest option is to pitch the least cost affecting solution. Kind of like picking the low hanging fruit.

Life is complicated, so are the measures for which municipal governments must stand on. None of that changes my opinion or thought process with the regard to the current proposal.

I'd suggest revising this whole process and expanding the view of the whole of Essex south end.

I am suggesting a new study be undertaken to review the entire south end with a view for long term (50 years) sustained area growth. Building a modern treatment facility capable of expanding beyond the 50 year proposal will service the area needs for generations. Building a facility on the north side of County Road 50,

NOT in the 100 year flood plain path is an option that should be considered verses expanding a WW facility that is already past it's prime.

We ALL know that the 100 year floods occur a far bit closer to <>5 years. Global warming and rising lake levels are a constant threat to our environment. Add to that the health of Lake Erie and the green algae that forms in the wester basin of Lake Erie every year which, in its self is a health issue that the Colchester facility is already contributing to.

ALTERNATIVE 7 All but puts the existing structure in as the ONLY option.

Under the 'select the preferred design....' bullet point the notes about social, economic and acceptable to the public comes after the need/desire to satisfy (builders) proposed development. I can say with almost 100% certainty that all of the residents of Lake Crest Beach are not in favour of the current proposal as laid out.

Please be advised that this study is being carried out in accordance with the following Municipal Class Environmental Assessment process :

Phase 1 – Identification of the problem
Phase 2 – Identification of alternative solutions to the problem, consultation with review agencies and the public, selection of the preferred solution, and identification of the project.
Phase 3 – Identification of alternative design concepts (technical alternatives) for the preferred solution, evaluation of the alternative designs and their impacts on the environment, consultation with review agencies and the public and selection of the preferred design.
Phase 4 – Preparation of an Environmental Study Report (ESR) to document the planning, design and consultation process for the project. The ESR is placed on the public registry for scrutiny by review agencies and the public.
Phase 5 – Final design, construction and commissioning of the selected technical alternative. Monitoring of construction for adherence to environmental provisions and commitments.

We are currently still in Phase 2 and collecting input from the public and review agencies in order to determine the preferred solution.

At this time, we have not yet identified and evaluated any alternatives for the lagoon expansions/upgrades. Upon the completion of Phase 2, we will move on to Phase 3. The design alternatives for existing sewage works upgrades/expansions will be evaluated based on the proposed development as well as consideration of the following:

- Population growth projection
- Town of Essex Official Plan
- Future development within the service area

As part of this study, we will continue to consult with the public, the MECP, the Essex Region Conservation Authority (ERCA), and other regulatory agencies. Phase 3 study will be presented at PIC No.2 next year.

Everyone I have spoke to understand municipalities grow and housing is needed.

I remain,
Mike Kelly,
487 Lake Crest Beach Road, Essex, Ontario

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From: Rick and Diana Glass
To: Rindlisbacher, Hannah
Subject: Re: Phase 2 public consultation
Date: Tuesday, December 13, 2022 6:19:41 PM

Thanks for listening.

On Tue, Dec 13, 2022 at 3:10 PM Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com> wrote:

> Hi Rick and Diana,
>
> Thank you for your comments. Please see our response to your comments below in blue font.
>
> Regards,
>
> **Hannah Rindlisbacher** B.A.Sc., E.I.T., LEED Green Associate
>
> Environmental Engineer in Training
>
> Direct: 519 966-2250 ext 258
> Mobile: 226 268-3033
> hannah.rindlisbacher@stantec.com
>
> Stantec
> 100-2555 Ouellette Avenue
> Windsor ON N8X 1L9
>
> 
>
> 
>
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-----Original Message-----
From: Rick and Diana Glass glassdearborn@gmail.com
Sent: Sunday, December 11, 2022 10:41 PM
To: dmcbeth@essex.ca; Rindlisbacher, Hannah Hannah.Rindlisbacher@stantec.com; Li, Jian jian.li@stantec.com
Subject: Phase 2 public consultation

We found a letter in the door the other day at our cottage at Lake Crest Beach regarding a possible waste treatment plant just across the street. It should have been mailed to the address used for taxes, since we don't use the place in winter. Please accept these late comments.

We are at 435 Lake Crest Court. Concerns:

1) Smell. We currently cannot open the windows when there is a northeast wind because it sometimes smells like human waste. If a treatment center is directly opposite the house, it will be worse due to closeness and increased likelihood of north wind.

At this time, we have not yet identified and evaluated any technical alternatives for the lagoon expansion/upgrades. Any expansion/upgrade to the existing facility will be carried out to comply with MECP standards for noise, vibration, odour or air pollution emissions. The evaluation of lagoon expansion/upgrade alternatives will be presented at PIC No.2 next year.

2) Potential flooding - please ensure that there is a drainage path that doesn't include this house as a lowest lying property. Right now, the drainage point is through the cottages at the corner of Lake Crest Beach and Lake Crest Court roads.

Stormwater management will be considered for the proposed expansion/upgrade to the existing facility, any potential negative impact of the proposed work on site drainage will be mitigated.

3) This proposition becomes more desirable if Lake Crest Court becomes a publicly maintained road. Currently, everyone pays and annual fee for grading and plowing.

Upgrading Lake Crest Court to a publicly maintained road is not part of the EA process. Changing the status of the road would require a Local Improvement Initiative brought for by the residents to the Town's Clerks Department, separately from this project.

4) We store our boat trailers across the road from the cottage in the field. If this area goes away, the we have a big problem - nowhere to store them.

The location and layout of the proposed expansion/upgrades to the Colchester South sewage works has not yet been determined at this stage in the Class EA. The evaluation of lagoon expansion/upgrade alternatives will be presented at PIC No.2 next year.

5) The trees in this area are good for the environment. The beach residents fought hard for this land to be ERCA controlled so that trees could be planted. I assume these would all be torn down.

Potential impacts on the ecosystem will be identified as part of this study. Any expansion/upgrade to the existing facility will be carried out in accordance with MECP standards for environmental impacts. The ESR report will describe proposed mitigation measures and how project planning will protect and enhance the local ecosystem. As part of this Class Environmental Assessment we will continue to consult with the Ministry of Environment, Conservation and Parks (MECP), the Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and the Essex Region Conservation Authority (ERCA) to determine special measures necessary to preserve and protect sensitive features.

Please reply to this email to confirm that our input will be considered, given that we weren't notified by mail, which we might have received before the comment cutoff date.

Sincerely, Diana and Rick Glass

313-565-6016

Sent from my iPhone

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APPENDIX D

Response from Public – Public Information Centre No.2

TOWN OF ESSEX
CLASS ENVIRONMENTAL ASSESSMENT
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
PUBLIC INFORMATION CENTRE NO.2
Colchester Community Centre
March 22nd, 2023 – 4:00 p.m. to 7:00 p.m.
SIGN-IN SHEET

No.	Name (Please Print)	Address	Telephone Number
1	LINDA Duggan	61 Harrison St	519-987-3788
2	PERRY BASSON	70 HARRISON ST	519 972-5949
3	GLORIA BASSON	70 HARRISON ST	519 972-5949.
4	Ann + Jon Taylor	432 Cty Rd 50 West	226-344-7080.
5	Jim + Erika Valvasori	843 Erie Blvd	226 788 9180
6	Doug Swol	37 Talbot	519-776-7336
7	JASON MATYI	687 FOX PLACE	519-259-5401
8	DAN BRUNOR	255 PRADO	519-738 9469
9	Mr. JABIB	Lasalle.	519 984 2228
10	JOSEPH GIORGI	333 Wyandotte St. E	519-258-5033
11	Rudhammond	Harrow	
12	BLAKE CUTCLIFFE	445 DUNN RD	905-842-8292

TOWN OF ESSEX
CLASS ENVIRONMENTAL ASSESSMENT
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
PUBLIC INFORMATION CENTRE NO.2
Colchester Community Centre
March 22nd, 2023 – 4:00 p.m. to 7:00 p.m.
SIGN-IN SHEET

No.	Name (Please Print)	Address	Telephone Number
13	Eric and Allison Campbell	431 Lake Crest Ct.	519 566 8961
14	ROB DIMENNA	457 LAKE CREST CT	519-996-0451
15	Bob & Mary Riberdy	433 Lake Crest Ct.	519.239-3075
16	MARK LABUTE	439 LAKE Crest	519-981-2232
17	Jim Lowberry	308 county Rd 50	519-816-5233
18	Angela & Kevin Ritchie	441 Lake Crest Crt	519-830-4958
19	John Rojek JR	215 Richardson lane	226 347 9000
20	KEN PRESTON	460 JACKSON	519 991 2005
21	Sherry Body	255 wellington	5195663105
22	Anne Macintate	145 Islandview	519-551-1041
23	SANDRA MCKEE	225 Prado Ave	519 981-1485
24			

PUBLIC INFORMATION CENTRE NO.2
COMMENT FORM

COLCHESTER SOUTH SEWAGE WORKS EXPANSION

The southern portion, or Urban Area, of Colchester South Community of the Town of Essex is serviced with a communal sewage system. Wastewater within this service area is collected by sanitary sewer systems and then conveyed to the existing Colchester South wastewater treatment facility for treatment. The Town has been realizing increasing wastewater servicing demands from significant development pressures within the community area. To ascertain this impact, the Town has initiated a Class Environmental Assessment (Class EA) to upgrade the existing Colchester South Sewage Works and expand the original service area.

This study will include an opportunity and problem statement, evaluation of alternative solutions, evaluation of alternative design concepts, and recommendations for the preferred design. This assessment will include consideration for potential environmental, social, and economic impacts as well as measures to mitigate adverse impacts.

THANK YOU

Public participation will form an integral part of this Class EA study to ensure that the concerns of the public and affected groups within the study area are identified, documented, and assessed. Thank you for your interest in this project and attendance at this public information centre.

Copies of the Public Information Centre No.2 material are available on the Town's project website below:

https://www.essex.ca/en/news/colchester-south-sewage-works-expansion.aspx

Please return your completed comment form on or before April 30th, 2023, to:

Hannah Rindlisbacher, E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 226-268-3033
hannah.rindlisbacher@stantec.com

Attention: Hannah Rindlisbacher
Stantec Consulting Ltd.
2555 Ouellette Avenue, Unit 100
Windsor ON
N8X 1L9

Stantec

COLCHESTER SOUTH SEWAGE WORKS EXPANSION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the Colchester South Sewage Works Expansion:

The SBR proposal to by
far the better way to go.

NAME Jon TAYLOR

EMAIL ADDRESS jtaylor225@hotmail.com

TELEPHONE NO. (519) 890 4326

DATE Mar 22/2023 SIGNATURE Jon Taylor

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PUBLIC INFORMATION CENTRE NO.2
COMMENT FORM

COLCHESTER SOUTH SEWAGE WORKS EXPANSION

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Please return your completed comment form on or before April 30th, 2023, to:

Hannah Rindlisbacher, E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 226-268-3033
hannah.rindlisbacher@stantec.com

Attention: Hannah Rindlisbacher
Stantec Consulting Ltd.
2555 Ouellette Avenue, Unit 100
Windsor ON
N8X 1L9

Stantec

COLCHESTER SOUTH SEWAGE WORKS EXPANSION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the Colchester South Sewage Works Expansion:

I feel that the developers and the new homes being built (including the new hotel should absorb the costs of any new sewage requirements. The homes in the village already have paid for their portion of sewage

NAME Linda Duggan

EMAIL ADDRESS lduggan52@hotmail.com

TELEPHONE NO. (519) 987-3788

DATE March 22/2022 SIGNATURE L Dugg

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From: Rindlisbacher, Hannah
To: Girard, Kevin; Li, Jian; McBeth, David
Cc: Jung, Chrissy
Subject: RE: 165620266 Colchester South EA - Assimilative Capacity Study Draft Report
Date: Thursday, April 27, 2023 12:38:00 PM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image006.png
image007.png
image008.png
165620266_G-101-).pdf

Hi Kevin,

Thanks for the update. We will include a section including the justification for utilizing the D-2 Guideline and an evaluation of the Town's OP in the ESR.

Please see the attached figure from PIC No.2 with the 100-m separation distance.

Thanks,

Hannah Rindlisbacher B.A.Sc., E.I.T., LEED Green Associate
Environmental Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From: Girard, Kevin <kgirard@essex.ca>
Sent: Thursday, April 27, 2023 12:28 PM
To: Li, Jian <jian.li@stantec.com>; Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>; McBeth, David <dmcbeth@essex.ca>
Cc: Jung, Chrissy <Chrissy.Jung@stantec.com>
Subject: RE: 165620266 Colchester South EA - Assimilative Capacity Study Draft Report

Good Afternoon

The Town had a meeting yesterday with the owner of the property to the northwest of the proposed sewage plant (Dr. Tabib). A few things were discussed, but a couple of things I needed to reach out to you for.

1. There was a conversation regarding the D-2 Guideline and the separation distance from the proposed development of Tabib's lands. I want to ensure that within the ESR, Stantec will include language on the minimum separation distance of 100m within the report. In addition, in that same section there should be an evaluation of the Town's Official Plan separation distance and the justification for utilizing the D-2 guideline as opposed to the Town's OP for minimum separation distance. For instance, the current wording of our OP is:

   > *A consent to sever or plan of subdivision application for the purpose of creating a residential lot or a lot for any other sensitive land use shall not be granted, if it would result in the construction of a new dwelling or other sensitive land use within 400 metres of a lot on which a sanitary sewage lagoon or sanitary sewage treatment facility is located (shown in Schedule "B" to this Plan) , whether or not the facility is within the boundaries of the Town, unless the proposed development meets the guideline provisions of MOE Guideline D-2, Compatibility Between Sewage Treatment and Sensitive Land Use' which will serve to determine setbacks and buffering requirements between any treatment works and a sensitive land use.*

   For this reason, it is important to make the justification for utilizing the D-2 guideline within the EA Planning process, as it will be reviewed by all stakeholders as well as the MECP. In addition, I spoke with the Ministry today who indicated that this may be a good route to proceed. Please include in the ESR.

2. Can you please send me the figure that shows the 100m separation distance of the plant. I recall seeing it at the PIC#2, but I don't think we received a digital copy of it. It would be helpful to have when discussing implications with landowners, developers and our Planning Department.

Thanks,

Kevin Girard, P.Eng, MBA
Director, Infrastructure Services | Office of the CAO
P: 519.776.7336 ext. 1119 | F: 519.776.8811
E kgirard@essex.ca | www.essex.ca
33 Talbot Street S. Essex, ON N8M 1A8

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From: Li, Jian <jian.li@stantec.com>
Sent: Thursday, April 6, 2023 10:58 AM
To: Girard, Kevin <kgirard@essex.ca>; Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>; McBeth, David <dmcbeth@essex.ca>
Cc: Jung, Chrissy <Chrissy.Jung@stantec.com>; Iskra, Igor <Igor.Iskra@stantec.com>
Subject: RE: 165620266 Colchester South EA - Assimilative Capacity Study Draft Report

From: Girard, Kevin
To: M.TABIB
Cc: Li, Jian; Rindlisbacher, Hannah; Chadwick, Lori; Jabbour, Rita
Subject: RE: Colchester South Sewage Works Expansion
Date: Thursday, May 25, 2023 11:29:49 AM
Attachments: essex_logo_colour_d7c21922-3a94-4fef-bf7a-752e7ad9fdb1.png
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yardwaste_emailsig_24131d07-d8cd-41a2-b103-8750e9e92bf2.png

Good Morning Mohamed,

Please see my responses below.

Thanks,

Kevin Girard, P.Eng, MBA
Director, Infrastructure Services | Office of the CAO
P: 519.776.7336 ext. 1119 | F: 519.776.8811
E: kgirard@essex.ca | www.essex.ca
33 Talbot Street S. Essex, ON N8M 1A8



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From: M.TABIB <rinad1003@gmail.com>
Sent: Thursday, May 25, 2023 10:39 AM
To: Girard, Kevin <kgirard@essex.ca>
Cc: Li, Jian <jian.li@stantec.com>; Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: Re: Colchester South Sewage Works Expansion

WARNING: This email originated from someone who is not sending from a Town of Essex email address. Reply only if you recognize the senders email address. Do not click links or open attachments unless you recognize the sender, the senders email address and know the content is safe.

Good morning Kevin,

I am looking forward to receiving a reply to our April 20th correspondence. Can you please let us know when we can expect a reply?

Regards.
Mohamed.

On Thu, Apr 20, 2023 at 11:56 AM M.TABIB <rinad1003@gmail.com> wrote:

> **Re: Municipal Class EA, Colchester South Sewage Works Expansion**
>
> **On March 22nd I attended the Open House for PIC No. 2, and I have reviewed the information presented at that time.**
>
> **I was pleased to see that the preferred solution now includes a proposed SBR Plant for the Colchester South WWTP. I do however have two questions, as follows:**
>
> - **On PIC Board No. 18 it states that *"the proposed site layout is positioned such that there is a minimum of 100 metres from existing residents and potential future residential developments on adjacent properties as per MECP Design Sewage Guidelines."* Please confirm that this solution, when implemented, will allow us to subdivide and create new residential building lots on our property, provided we maintain this 100 metre setback distance as shown on the attached figure prepared by Stantec Consulting?; The proposed SBR facility in the Colchester South EA is being proposed using recommended buffer distances from the MECP D-2 Guideline, which is 100 metres for plants between 500 m^3/day and 25,000 m^3/day. Whether you can subdivide and create lots on your adjacent property is not only governed by this setback, but potentially any other Town Planning policies. These questions will need to be directed to our Planning Department who is cc'd.**
> - ***W*e are currently working on the preparation of the supporting natural heritage, archaeological, and other reports/studies needed to file as part of a complete draft plan of subdivision application for these residentially designated lands located to the north and west of the expanded WWTP site. When does the Town intend to move forward with the detailed design, tendering and construction of this new SBR Plant. The Town is currently undertaking the Colchester South EA as part of the Environmental Planning process. The timing for Phase 5 of the EA planning process (implementation phase) is not known at this time.**



Thank you in advance for your assistance in this regard.

Sincerely,

M. Tabib

Caution: This email originated from outside of Stantec. Please take extra precaution.

Attention: Ce courriel provient de l'extérieur de Stantec. Veuillez prendre des précautions supplémentaires.

Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

APPENDIX D

Response from Review Agencies – Notice of Draft ESR

Ministry of Citizenship and Multiculturalism

Heritage Planning Unit
Heritage Branch
Citizenship, Inclusion and Heritage Division
5th Flr, 400 University Ave
Tel.: 613.242.3743

Ministère des Affaires civiques et du Multiculturalisme

Unité de la planification relative au patrimoine
Direction du patrimoine
Division des affaires civiques, de l'inclusion et du patrimoine
Tél.: 613.242.3743

June 14, 2023 EMAIL ONLY

Hannah Rindlisbacher B.A.Sc., E.I.T.,
Process Engineer in Training
Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9
hannah.rindlisbacher@stantec.com

MCM File	**:**	**0017422**
Proponent	**:**	**Town of Essex**
Subject	**:**	**Municipal Class EA – Schedule C – Notice of draft Environmental Study Report**
Project	**:**	**Colchester South Sewage Works Expansion**
Location	**:**	**Town of Essex**

Dear Hannah Rindlisbacher:

Thank you for making the Draft Environmental Study Report (ESR) (dated May 26, 2023, prepared by Stantec) available for the Ministry of Citizenship and Multiculturalism (MCM) review and comment.

MCM's interest in this project relates to its mandate of conserving Ontario's cultural heritage.

Project Summary
The Town has experienced increased wastewater servicing demands from significant development pressures within the community area. To ascertain this impact, the Town has initiated a Class Environmental Assessment (Class EA) to expand the existing Colchester South Sewage Works. The Colchester South Wastewater Treatment Facility (WWTF) is located on a 12.16 hectare parcel of land approximately 500 metres south of County Road 50 with access off Cornwall Beach Road. A new WWTF is proposed adjacent to the existing facility. The study is being undertaken in accordance with the planning and design process for 'Schedule C' projects outlined in the Municipal Class Environmental Assessment (June 2000, as amended in 2007, 2011 and 2015) under the Ontario *Environmental Assessment Act.*

Comments

We have reviewed the above referenced draft ESR and have the following comments and observations:

Archaeological Assessment

A Stage 1 archaeological assessment (AA) and report (under Project Information Form (PIF) P422-0030-2023) has yet to be submitted to MCM for review.

Please note that archaeological concerns have not been addressed until reports have been entered into the Ontario Public Register of Archaeological Reports where those reports recommend that:

1. the archaeological assessment of the project area is complete and
2. all archaeological sites identified by the assessment are either of no further cultural heritage value or interest (as per Section 48(3) of the *Ontario Heritage Act*) or that mitigation of impacts has been accomplished through excavation or an avoidance and protection strategy.

Approval authorities and proponents typically wait to receive the ministry's review letter for an archaeological assessment report before issuing a decision on the application as it can be used, for example, to document that due diligence has been undertaken. Depending on your timelines, we recommend that you reach out to your licensed archaeological to submit a request for expedited review through our online PastPort system.

MCM recommends that any further recommended archaeological assessments (e.g., Stage 2, 3 and 4) be undertaken by a licensed archaeologist as early as possible during detailed design and prior to any ground disturbing activities.

Built Heritage Resources and Cultural Heritage Landscapes

A Heritage Review – Colchester South Sewage Works Expansion, Schedule 'C' Municipal Class Environmental Assessment (dated June 1, 2023 and prepared by Stantec) was undertaken in support of this EA. The Heritage Review was undertaken to identify known and potential built heritage resources and cultural heritage landscapes, present within and adjacent to the Cultural Heritage Study Area. The Cultural Heritage Study Area for this Heritage Overview includes a 50-metre buffer around the proposed WWTF. The Heritage Review identified one heritage property - the Hutchins Cemetery, which has been designated by the Town under Part IV of the OHA. The Heritage Review does not include a preliminary impact assessment of the project on the Hutchins Cemetery's cultural heritage value or interest (CHVI) – impacts to above ground and identified heritage attributes identified in the designation bylaw.

MCM recommends that a Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment be undertaken and summarized in the ESR. This study will:

1. Describe the existing baseline cultural heritage conditions within the study area by identifying all known or potential built heritage resources and cultural heritage landscapes, including a historical summary of the study area. This would be based on the Heritage Review.

2. Identify preliminary potential project-specific impacts on the known and potential built heritage resources and cultural heritage landscapes that have been identified. The report should include a description of the anticipated impact, if any, to the Hutchins Cemetery's CHVI.

3. Recommend measures to avoid or mitigate potential negative impacts to known or potential built heritage resources and cultural heritage landscapes. The proposed mitigation measures are to inform the next steps of project planning and design.

The Heritage Review partially addresses Step 1. Therefore, we recommend that the Heritage Report be updated to include Steps 2 and 3. The updated Heritage Report (or Cultural Heritage Report) shall be completed within the EA process and submitted to MCM and other interested parties, including Indigenous communities, for review and comment.

More detailed comments to support the ESR's documentation of cultural heritage due diligence are in the attached table.

Please note that the responsibility for administration of the Ontario Heritage Act and matters related to cultural heritage have been transferred from the Ministry of Tourism, Culture and Sport (MTCS) to the Ministry of Citizenship and Multiculturalism (MCM). Individual staff roles and contact information remain unchanged. Please continue to send any notices, report and/or documentation to both Karla Barboza and myself.

- Karla Barboza, Team Lead - Heritage | Heritage Planning Unit (Citizenship and Multiculturalism) | 416-660-1027 | karla.barboza@ontario.ca
- Joseph Harvey, Heritage Planner | Heritage Planning Unit (Citizenship and Multiculturalism) | 613-242-3743 | joseph.harvey@ontario.ca

Thank you for providing us with the opportunity to review the draft ESR. If you have any questions or require clarification, please do not hesitate to contact me.

Sincerely,

Joseph Harvey
Heritage Planner
Heritage Planning Unit
joseph.harvey@Ontario.ca

Copied to: Jian Li, Project Manager, Stantec Consulting Ltd.
David McBeth, Manager, Capital Works and Asset Management
Mark Badali, Environmental Resource Planner & EA Coordinator, MECP

It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. The Ministry of Citizenship and Multiculturalism (MCM) makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MCM be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

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

The *Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33* requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with *Ontario Regulation 30/11* the coroner shall notify the Registrar, Ontario Ministry of Public and Business Service Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*.

Item	Document Section	Given Text	MCM Comments
1.	2.0 (Existing Conditions) p. 9	n/a	This section should address the existing conditions as they relate to the cultural heritage environment. We recommend including the following new sub section under section 2.0: *Cultural Heritage Environment* This section describes the cultural heritage component of the environment, which includes archaeological resources, built heritage resources-and cultural heritage landscapes. *Archaeological Resources* A Stage 1 archaeological assessment (AA) (under Project Information Form number (PIF) P422-0030-2023) was undertaken on May 16, 2023, by Stantec Inc. for the study area. A Stage 1 AA consists of a review of geographic, land use and historical information for the property and the relevant surrounding area, and contacting MCM to find out whether, or not, there are any known archaeological sites on or near the property. Its purpose is to identify areas of archaeological potential and further archaeological assessment (e.g., Stage 2-4) as necessary. The Stage 1 AA report is included in Appendix E. [Then include the outcomes and recommendations of the report, as is in the Executive Summary – just copy and paste, don't summarize] Any further recommended assessment (e.g., Stage 2-4) will be completed as early as possible in the detailed design phase and prior to any ground disturbing activities. *Built Heritage Resources and Cultural Heritage Landscapes* A Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment [date & consultant] was undertaken to assess the preferred alternatives for known (previously recognized) or potential built heritage

Item	Document Section	Given Text	MCM Comments
			resources and cultural heritage landscapes (BHR/CHLs). Based on the report, it was determined that there is one heritage property - the Hutchins Cemetery - designated by the Town under Part IV of the OHA. The Cultural Heritage Report is included in Appendix X. [Insert the recommendations of the Cultural Heritage Report – Copy and paste do not summarize] A copy of the designation bylaw for the Hutchins Cemetery should also be included as an appendix to the Cultural Heritage Report. See also comments in the cover letter. We may have additional comments on how cultural heritage due diligence has been addressed once the Stage 1 AA has been entered into the Register and the Cultural Heritage Report has been completed.
2.	4.1 (Introduction – Alternative Design Solutions) p. 27	… The seven alternative solutions were evaluated based on a variety of social, natural environmental, economic, and technical criteria. These evaluation criteria were developed based on servicing needs at the wastewater treatment facility, applicable municipal plans / commitments, design principles, and past industrial experience. The evaluation criteria are as follows: … Social Criteria: • Impact to archaeological, built heritage, and cultural heritage	We recommend including a separate list of criteria relating to the cultural heritage environment. Please see the suggested revision below: … The seven alternative solutions were evaluated based on a variety of social, natural environmental, economic, and technical criteria. These evaluation criteria were developed based on servicing needs at the wastewater treatment facility, applicable municipal plans / commitments, design principles, and past industrial experience. The evaluation criteria are as follows: … Social Criteria: • ~~Impact to archaeological, built heritage, and cultural heritage~~ • …

Item	Document Section	Given Text	MCM Comments
		• …	Cultural Heritage Criteria • Impacts to archaeological sites or areas of archaeological potential • Impacts to known or potential built heritage resources and cultural heritage landscapes
3.	4.2 (Description of Alternative Solutions – Alternative Design Solutions) p. 28-32	n/a	This section will need to be revised to reflect our suggested revisions to table 4.1 below.
4.	4.3 (Evaluation of Alternative Design Solutions – Alternative Design Solutions) Table 4.1 p. 34	Evaluation Criteria • Social Alternative 6: Independent Onsite WWTP • WWTP would be <1 km from the Town Center • Outlet would be approximately 600 m upstream of the Colchester Harbor and Beach • Higher impacts to society • Low potential for archaeological, • built heritage, and/or cultural heritage resources Alternative 7: Expand & Upgrade Colchester South Sewage Works • No changes to the existing outlet • Lower impacts to society • Low potential for archaeological, built heritage, and/or cultural heritage resources	Table 4.1 will need to be revised to reflect our suggested revisions to the terminology included in section 4.1 above. See comment 2 above. Evaluation Criteria • Social Alternative 6: Independent Onsite WWTP • WWTP would be <1 km from the Town Center • Outlet would be approximately 600 m upstream of the Colchester Harbor and Beach • Higher impacts to society ~~• Low potential for archaeological,~~ ~~• built heritage, and/or cultural heritage resources~~ Alternative 7: Expand & Upgrade Colchester South Sewage Works • No changes to the existing outlet • Lower impacts to society ~~• Low potential for archaeological, built heritage, and/or cultural heritage resources~~

Item	Document Section	Given Text	MCM Comments
			Evaluation Criteria • **Cultural Heritage** **Alternative** [1-7] … • [For each alternative a bullet should reflect the findings of the Stage 1 archaeological assessment] • [For each alternative a bullet should reflect the findings of the Cultural Heritage Report]
5.	9.1 (Overview – Environmental Impacts and Mitigations) Table 9.1	Operation - Trenching /tunnelling, excavation, and construction for wastewater treatment facilities at the Colchester South Sewage Works site Impact - Archaeological and heritage resources. Mitigation Measures - The MCM's "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes" checklist was completed for the study area and a Stage 1 Archaeological Assessment was completed, and archaeological potential was identified. - The Hutchin's Cemetery, a pioneer family cemetery was identified in the Stage 1 assessment.	We recommend making the following revisions to table 9.1. Operation - Trenching /tunnelling, excavation, and construction for wastewater treatment facilities at the Colchester South Sewage Works site Impact - Archaeological ~~and heritage~~ resources. Mitigation Measures - ~~The MCM's "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes" checklist was completed for the study area and a Stage 1 Archaeological Assessment was completed, and archaeological potential was identified.~~ - The Hutchin's Cemetery, a pioneer family cemetery was identified in the Stage 1 archaeological assessment and the Heritage Review. - A Stage 2 Archaeological Assessment <u>and any further recommended assessment (e.g., Stage 3-4)</u> will be completed as early as possible during detailed design and prior to any ground disturbance. - Discussions with the MCM and Bereavement Authority of Ontario (BAO) will take place to determine avoidance & protection and/or

Item	Document Section	Given Text	MCM Comments
		- A Stage 2 Archaeological Assessment will be completed prior to any ground disturbance. - Discussions with the MCM and Bereavement Authority of Ontario (BAO) will take place to determine avoidance & protection and/or mitigation measures around the Hutchin's Cemetery.	mitigation measures around the Hutchin's Cemetery. - Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out an archaeological assessment, in compliance with Section 48(1) of the *Ontario Heritage Act*. - The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with Ontario Regulation 30/11 the coroner shall notify the Registrar, Ontario Ministry of Public and Business Service Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*. Impact - Built Heritage Resources and Cultural Heritage Landscapes Mitigation Measures - [Insert the recommendations of the Cultural Heritage Report. Copy and paste, do not summarize]

Item	Document Section	Given Text	MCM Comments
6.	9.3 (Cultural Heritage Environment – Environmental Impacts and Mitigation Measures) p. 94-95	9.3 Cultural Heritage Environment The study area (proposed work site) is situated on part of Lot 83, Concession 1 in the Town of Essex, refer to Figure 9.4 in Appendix A. The area is a former agricultural field which is now a restoration area consisting of woodlot, scrubland, and an unnamed creek. 9.3.1 Archaeological Resources A Stage 1 Archaeological Assessment was undertaken by Stantec of the Project's study area (under Project Information Form [PIF] number P422-0030-2022). Stage 1 Archaeological Assessments are conducted in compliance with the provincial standards and guidelines set out by the Ministry of Citizenship and Multiculturalism (MCM) in the 2011 … 9.3.2 Built Heritage Resources and Cultural Heritage Landscapes The MCM's Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes checklist was completed for the Study Area. The Checklist determined that the Hutchins Family Cemetery is situated adjacent to the Study Area and …	Section 9.3 appears to address the existing conditions for the cultural heritage environment. We recommend that the cultural heritage component of the environment be addressed in a new sub-section under section 2.0 (Existing Conditions). Please see comment 1 above.

Item	Document Section	Given Text	MCM Comments
7.	9.6 (Permitting Considerations) p. 99	n/a	This section does not address potential impacts to cultural heritage resources. We recommend including the following new sub-section to align with current legislation and terminology. Ministry of Citizenship and Multiculturalism Archaeological assessment(s) are required for areas of archaeological potential. Archaeological concerns have not been addressed until the Ministry of Citizenship and Multiculturalism's has provided its letter indicating that all reports have been entered into the Ontario Public Register of Archaeological Reports and those reports recommend that: • the archaeological assessment of the project area is complete and • all archaeological sites identified by the assessment are either of no further cultural heritage value or interest (as per Section 48(3) of the *Ontario Heritage Act*) or that mitigation of impacts has been accomplished through an avoidance and protection strategy. Please note that there may be a need to include a section on municipal requirements as any alterations to a heritage property (designated under the *Ontario Heritage Act*) would require a heritage permit and Council's consent.

Stantec Consulting Ltd.
100-140 Ouellette Place, Windsor ON N8X 1L9

June 23, 2023
File: 165620266

Attention: Mr. Joseph Harvey, Heritage Planner

Ministry of Citizenship and Multiculturalism
400 University Avenue, 5th Floor
Toronto ON, M7A 2R9

Dear Mr. Harvey,

Reference: Municipal Class Environmental Assessment – Schedule C – Colchester South Sewage Works Expansion

Thank you for your prompt response to the May 30, 2023, Draft ESR for Colchester South Works Expansion, Town of Essex. The following is in response to your comments on the draft ESR, which was received on June 14, 2023.

Archaeological Assessment

The Stage 1 archaeological assessment report was submitted to the MCM for review on June 15, 2023, with a request for expedited review that was granted on June 21, 2023, with an expected review date by August 2, 2023.

The required Stage 2 archaeological assessment and any further recommended archaeological assessments will be undertaken by a licensed archaeologist early in the detailed design stage prior to any ground disturbance.

Built Heritage Resources and Cultural Heritage Landscapes

The Heritage Overview fulfills the current needs of the Municipal Class EA for Colchester South Sewage Works Expansion as the EA team works to develop a conceptual design for the wastewater treatment facility (WWTF). If a Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment was prepared, it would come to the same recommendations at this stage, as we have included within the Heritage Overview for the Hutchins Cemetery. We included as a recommendation in the Heritage Overview, that the Cultural Heritage Specialists and Archaeologists review the design for the WWTF at 30%, 60%, 90%, and 100% stages to provide feedback, if any, on the potential interactions of the cemetery. As a cemetery, any potential impacts identified during the detailed design stages will be assessed and mitigated through additional archaeological assessments. If potential impacts to above ground heritage attributes are identified by the Cultural Heritage Specialist during the detailed design stages, a heritage impact assessment may be required.

Reference: **Municipal Class Environmental Assessment – Schedule C – Colchester South Sewage Works Expansion**

Item No.1: 2.0 Existing Conditions p.9

Section 2.0 Existing Conditions will be updated to include a sub-section called 'Cultural Heritage Environment' which will address existing conditions as they relate to the cultural heritage environment.

Item No.2: 4.1 Introduction – Alternative Design Solutions p.27

A separate list of criteria relating to the cultural heritage environment will be added to this section.

Item No.3: 4.2 Description of Alternative Solutions p.28-32

This comment refers to revisions for Table 4.1, but it seems that the comment was referring to Table 4.2.

Section 4.2 Description of Alternative Solutions will be revised to reflect the revisions made to Table 4.2 as mentioned in Item No.4.

Item No.4: Evaluation of Alternative Design Solutions p.34

This comment refers to revisions for Table 4.1, but it seems that the comment was referring to Table 4.2.

Table 4.2 only evaluates the alternatives that were carried forward for evaluation, Alternatives 6 and 7. This Environmental Study Report is based on the Alternative 7 solution, Expand & Upgrade Colchester South Sewage Works which is identified as the recommended solution. Therefore, the Stage 1 Archaeological Assessment and the Heritage Overview Memo were only completed for the recommended solution. At this stage of evaluation, the exact site locations are not confirmed, so the evaluation is only based on archaeological/heritage information that was available on the Town of Essex, Heritage Register webpage for the general areas of these alternatives. Table 4.2 will be revised to reflect revisions to the terminology in Section 4.1 and 4.2 and include the cultural heritage evaluation criteria based on the information that was available at that point in the evaluation of alternative solutions.

Item No.5: 9.1 Overview – Environmental Impacts and Mitigations Table 9.1

The revisions to Table 9.1 will be made as recommended.

Item No.6: 9.3 Cultural Heritage Environment p.94-95

Section 9.3 Cultural Heritage Environment will be addressed under Section 2.0 Existing Conditions.

Reference: **Municipal Class Environmental Assessment – Schedule C – Colchester South Sewage Works Expansion**

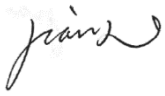
Item No.7: 9.6 Permitting Considerations p.99

Section 9.6 Permitting Considerations will be updated to include a new sub-section called Ministry of Citizenship and Multiculturalism to align with current legislation and terminology.

Stantec Consulting Ltd.



Hannah Rindlisbacher B.A.Sc., E.I.T.
Environmental Engineer in Training
Phone: 519 966 2250
hannah.rindlisbacher@stantec.com



Jian Li Ph.D., P.Eng., PE
Project Manager
Phone: 519 966 2250
jian.li@stantec.com

c. Mr. David McBeth, Manager Capital Works & Asset Management, Town of Essex

From:	Rivard, Meaghan
To:	Harvey, Joseph (MCM)
Cc:	Barboza, Karla (MCM); Li, Jian; Jones, Lashia; Rindlisbacher, Hannah; Hatcher, Laura (MCM)
Subject:	RE: 165620266 Colchester South Sewage Works Expansion - MCM Draft ESR Comments
Date:	Monday, July 31, 2023 2:11:25 PM

Hi Joseph,

This looks good to us!

We'll revise the memo and provide you with a copy for MCM records.

Thanks again to you and Karla for the discussion here.

Best,
Meaghan

From: Harvey, Joseph (MCM) <Joseph.Harvey@ontario.ca>
Sent: Friday, July 28, 2023 1:11 PM
To: Rivard, Meaghan <Meaghan.Rivard@stantec.com>
Cc: Barboza, Karla (MCM) <Karla.Barboza@ontario.ca>; Li, Jian <jian.li@stantec.com>; Jones, Lashia <Lashia.Jones@stantec.com>; Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>; Hatcher, Laura (MCM) <Laura.E.Hatcher@ontario.ca>
Subject: FW: 165620266 Colchester South Sewage Works Expansion - MCM Draft ESR Comments

Hi Meaghan,

Thanks for getting back to us so quickly. Overall we support the suggested approach.

Our main concern is whether the heritage attributes and boundaries of the cemetery have been sufficiently defined. At a minimum we recommend the Reasons for Designation included in the designating by-law be revisited prior to undertaking the HIA. I've included a minor revision to the suggested text in bold below:

- Complete a property-specific ~~CHER~~/HIA for the Hutchins Cemetery, prior to detailed design and any alterations. The ~~CHER~~ HIA will include **a reassessment of** the Reasons for Designation contained within *Schedule "B" to Bylaw No. 1059 of the Corporation of the Town of Essex Reasons for Designation – Hutchins* Cemetery ~~evaluation of the property against O.Reg. 9/06~~ and confirm the heritage attributes and boundaries of the cemetery as a protected heritage property. The Impact Assessment will include recommendations and specific mitigation measures for impacts to identified heritage attributes.

Thanks,

Joseph Harvey | Heritage Planner
Citizenship, Inclusion and Heritage Division | Heritage Branch | Heritage Planning Unit
Ministry of Citizenship and Multiculturalism
613.242.3743
Joseph.Harvey@ontario.ca

Effective October 17, 2022, units responsible for cultural heritage matters have been transferred from the Ministry of Tourism, Culture and Sport (MTCS) to the Ministry of Citizenship and Multiculturalism (MCM). Responsibility for the Ontario Heritage Act and associated Provincial functions is now held by MCM. Individual staff roles and contact information remain unchanged.

From: Rivard, Meaghan <Meaghan.Rivard@stantec.com>
Sent: July 26, 2023 3:23 PM
To: Harvey, Joseph (MCM) <Joseph.Harvey@ontario.ca>
Cc: Barboza, Karla (MCM) <Karla.Barboza@ontario.ca>; Li, Jian <jian.li@stantec.com>; Jones, Lashia <Lashia.Jones@stantec.com>; Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - MCM Draft ESR Comments

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Joseph,

Thank you so much for sending this along!

The below looks great. One point of clarification. I've reviewed the Reasons for Designation included in the designating by-law (these will be attached to the revised memo) and found them to be reasonably comprehensive. See here: https://www.heritagetrust.on.ca/oha/details/file?id=239

May we amend the text below to reference the need for an HIA (and not CHER) given that the property has already been assessed according to 9/06?

Feel free to give me a call to discuss if it's easier (226-268-9025).

Best,
Meaghan

From: Harvey, Joseph (MCM) <Joseph.Harvey@ontario.ca>
Sent: Friday, July 21, 2023 2:57 PM
To: Rivard, Meaghan <Meaghan.Rivard@stantec.com>
Cc: Barboza, Karla (MCM) <Karla.Barboza@ontario.ca>; Li, Jian <jian.li@stantec.com>; Jones, Lashia <Lashia.Jones@stantec.com>; Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: FW: 165620266 Colchester South Sewage Works Expansion - MCM Draft ESR Comments

Hi Meaghan,

Thanks for meeting with us and for getting back to us so quickly with the proposed language.

We recommend revising the text provided for the "Alternate Option" so that it includes the following recommendations:

- Complete a property-specific ~~CHER~~/HIA for the Hutchins Cemetery, prior to detailed design and any alterations. The ~~CHER~~ HIA will include the Reasons for Designation contained within *Schedule "B" to Bylaw No. 1059 of the Corporation of the Town of Essex Reasons for Designation – Hutchins* Cemetery ~~evaluation~~

~~of the property against O.Reg. 9/06~~ and confirm the heritage attributes and boundaries of the cemetery as a protected heritage property. The Impact Assessment will include recommendations and specific mitigation measures for impacts to identified heritage attributes.
- The ~~CHER~~/HIA will also consider the compatibility of new structures or landscape features with the cemetery's heritage attributes.
- The ~~CHER~~/HIA shall be submitted to MCM, municipality and other interested parties for review and comment.

In addition, we recommend revising the second paragraph under Recommendations so that it is consistent with the Preferred and Alternate Options and the recommendations provided above.

Please let me know if you have any additional questions or concerns,

Joseph Harvey | Heritage Planner
Citizenship, Inclusion and Heritage Division | Heritage Branch | Heritage Planning Unit
Ministry of Citizenship and Multiculturalism
613.242.3743
Joseph.Harvey@ontario.ca

Effective October 17, 2022, units responsible for cultural heritage matters have been transferred from the Ministry of Tourism, Culture and Sport (MTCS) to the Ministry of Citizenship and Multiculturalism (MCM). Responsibility for the Ontario Heritage Act and associated Provincial functions is now held by MCM. Individual staff roles and contact information remain unchanged.

From: Rivard, Meaghan <Meaghan.Rivard@stantec.com>
Sent: July 19, 2023 5:09 PM
To: Harvey, Joseph (MCM) <Joseph.Harvey@ontario.ca>; Barboza, Karla (MCM) <Karla.Barboza@ontario.ca>
Cc: Li, Jian <jian.li@stantec.com>; Jones, Lashia <Lashia.Jones@stantec.com>; Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - MCM Draft ESR Comments

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Joseph and Karla,

Hope you have both had good starts to the week!

Please find below the language we are proposing to add to the Heritage Memo, as discussed on Friday. We have also added the requirement in the Recommendations that the Cultural Heritage Specialist and Archaeologist advise on the appropriate mitigation measures.

Let us know if this works and we will make the change and distribute the memo.

Thanks again for a great conversation!

Best,
Meaghan

4 Preliminary Impact Assessment

Based on consultation with the appropriate regulatory bodies and completion of the MCM Checklist, one municipal heritage property, the Hutchins Cemetery, designated by the Town under Part IV of the OHA, was identified within the Cultural Heritage Study Area. As a cemetery, recommendations in this Heritage Overview have been coordinated with the Stage 1 Archaeological Assessment that was completed by Stantec for the EA (Stantec 2023).

A legal survey of the Hutchins Cemetery and its exact boundaries could not be completed during the course of the Heritage Overview or the Stage 1. Therefore, the absence of burial activities that extend beyond legal boundaries could not be confirmed. Depending on the future proposed locations of the construction footprint or staging areas for the WWTF, there may be potential for impacts to the cemetery. As a result, the following preliminary mitigation measures should be considered when preparing detailed design:

Preferred Option: Avoid the cemetery by establishing a buffer zone around the currently understood boundaries to limit construction activity to more than 50 metres away. This should use appropriate preventive measures such as mapping the cemetery on construction maps and using temporary fencing to denote the cemetery. Staging and laydown areas should also be non-invasive and avoid the cemetery. Where avoidance is not feasible, the alternative option should be applied.

Alternative Option: Where construction activities are anticipated within the 50 metre buffer zone, a pre-construction vibration assessment by a qualified engineer is recommended to determine if vibration monitoring or site plan controls are required. In addition, as required by the OHA, archaeological assessments should be completed as per the *Standards and Guidelines for Consultant Archaeologists*.

5 Recommendations

The final design and the construction footprint for the WWTF should be designed in a manner that avoids potential impacts to the Hutchins Cemetery. Detailed designs for the WWTF should be provided to the Cultural Heritage Specialists and Archaeologists for review at 30%, 60%, 90%, and 100% stages to provide feedback, if any, on the potential interactions with the cemetery and advise on the mitigation measures identified above. The location of the cemetery should be mapped on construction maps and temporary fencing should be installed. Staging and laydown areas should be selected to be non-invasive and avoid the cemetery's currently understood property boundaries.

It is recommended that if the project footprint, including construction and staging spaces, is situated within 10 metres of the cemetery's currently understood boundaries, further investigation may be warranted in consultation with MCM and the BAO. This may include further background research to determine if the original property boundaries can be identified. If they can not be identified, construction impacts within a minimum of 10 metres of the cemetery's currently understood property boundaries, must be subject to further investigation. This would include Stage 2 test pit survey of the areas with topsoil followed by a Stage 3 cemetery investigation under the supervision of a licensed archaeologist. See the Stage 1 for further details (Stantec 2023).

-----Original Appointment-----
From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: Tuesday, July 11, 2023 10:35 AM

To: Rindlisbacher, Hannah; Rindlisbacher, Hannah; Jones, Lashia; Rivard, Meaghan; Harvey, Joseph (MCM); Li, Jian
Cc: Barboza, Karla (MCM)
Subject: 165620266 Colchester South Sewage Works Expansion - MCM Draft ESR Comments
When: Friday, July 14, 2023 2:00 PM-2:30 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Microsoft Teams Meeting

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Ministry of the Environment, Conservation and Parks

Environmental Assessment Branch

1st Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax.: 416 314-8452

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction des évaluations environnementales

Rez-de-chaussée
135, avenue St. Clair Ouest
Toronto ON M4V 1P5
Tél. : 416 314-8001
Téléc. : 416 314-8452

Via E-mail Only

June 27, 2023

Hannah Rindlisbacher
Process Engineer in Training
Stantec Consulting Ltd.
hannah.rindlisbacher@stantec.com

Re: Colchester South Sewage Works Expansion
Town of Essex
Municipal Class Environmental Assessment – Schedule C
Project Review Unit Comments – Draft Environmental Study Report

Dear Hannah Rindlisbacher,

Thank you for providing the ministry with an opportunity to comment on the draft Environmental Study Report (ESR) for the above noted Class Environmental Assessment (EA) project. Our understanding is that in order to accommodate increased wastewater servicing demands in the Colchester South community, the Town of Essex (the proponent) has determined that the preferred alternative is to expand the existing service area and upgrade the existing Colchester South Sewage Works including the Wastewater Treatment Facility (WWTF) and Pumping Stations No. 1, 2, 3, 5, 6, and 7. Sequencing Batch Reactor was identified as the preferred treatment technology and trucking liquid sludge from the Colchester South WWTF to the Essex Pollution Control Plant was identified at the preferred biosolids management strategy. The Ministry of the Environment, Conservation and Parks (ministry) provides the following comments for your consideration.

General

1) Section 1.2.1 of the ESR states, "*As part of the Class EA procedure, the proponent is required to state how the project is to proceed and gain approval under the Act. There are four approval mechanisms available to the proponent under the Class EA*:"

a. The ministry notes that while the Municipal Class EA process is approved under the *Environmental Assessment Act* (EAA), projects included within the Class EA may be implemented without further approval under the EAA provided that the appropriate approved Class EA planning process is followed.

b. Following the above-mentioned statement, the ESR lists three classifications of undertakings, Eligible for Screening to Exempt, Schedule B, and Schedule C, despite having just noted that there are "…*four approval mechanisms available…*".

2) In order to reflect the 2023 amended version of the Municipal Class EA that is referenced in section 1.2.1 of the ESR, the ministry recommends revising section 1.2.2 from, "*Phase 2 – Identification of alternative solutions to the problem…, and identification of the project as a Schedule A, A+, B or C activity.*" to, "*Phase 2 – Identification of alternative solutions to the problem…, and identification of the project as Exempt, Eligible for Screening to Exempt, or a Schedule B or C activity.*"

3) In the Indigenous Consultation Log in Appendix D of the ESR, every row that documents correspondence of the 2nd Open House states, "*The 1st Open House was held on March 22nd, 2023*." The ministry presumes that these statements should be corrected to, "*The 2nd Open House was held on March 22nd, 2023.*"

4) Section 3.2.5 of the Appendix E: Natural Heritage Impact Assessment Report for the ESR states, "*The list of SAR identified as potentially present in the Study Area is provided in Table*." Presumably, this should be corrected to reference Table 4.

Planning and Policy

5) Sections 9.2.1 and 9.2.11 of the ESR discuss how policies of the Provincial Policy Statement (PPS) relate to this project's potential environmental impacts on the aquatic and terrestrial habitat and climate change. As noted in Section C.1.1 of the Municipal Class EA document, the PPS is a key consideration for identifying land-use planning objectives and evaluating alternative solutions in Phases 2 and 3 of the Class EA process for water/wastewater projects. Please be advised that it is the ministry's preference that reports documenting the Municipal Class EA process include a distinct section to discuss the provincial planning and policy context for the project, particularly the Provincial Policy Statement, 2020.

6) Section 9.2.11 of the ESR references the Provincial Policy Statement (2014). Please ensure that the ESR includes a discussion on any relevant changes that came into effect in 2020, when the Provincial Policy Statement was last updated

Indigenous Consultation

7) The proponent should continue to engage with all communities that have been engaged with to date as the Class EA process proceeds.

Monitoring

8) The ministry recommends that a discrete section be added to the ESR that discusses development and implementation of a monitoring program, as described in section A.4.2.1

of the Municipal Class EA parent document. Where possible, the program should monitor and review the environmental impacts predicted and the commitments made to mitigation throughout the planning and design process, and describe how unexpected environmental effects identified during the monitoring program will be addressed.

Surface Water

9) The ministry offers the following preliminary comments with respect to the Appendix C: Assimilative Capacity Study for the ESR. The ministry's final assessment of the Assimilative Capacity Study (ACS) is pending the proponent's responses to these comments:

    a. The approach taken to assess assimilative capacity of the receiver, Lake Erie, is reasonable and acceptable according to the guidance provided in the ministry's Procedure B-1-5 (MOE 1994b).

    b. Water quality data to analyze background water quality of Lake Erie were taken from the Lake Erie Water Quality Monitoring database (Great Lakes Data Stream 2023) for stations 971, 971A, 1297, 1328, 1461, and 1466. Please provide all water quality monitoring data used in this ACS.

    c. It was noted that station #1466 is spatially closest to the outfall location and technically should only be used for assessing background water quality of the receiver at the effluent discharge location. Please provide rationale for using data from multiple monitoring stations for this purpose. If the water quality data only from station #1466 were to use in the assessment of ambient water quality, please provide an explanation of how that would affect the final results of the ACS and more importantly the values of proposed effluent limits and objectives. It would be more interesting to see if TP data for station #1466 would still characterize the receiver as policy 1.

    d. Please provide parameter values (more specifically pH and temperature) used in the analysis of unionized ammonia for both summer and winter worse-case scenarios.

    e. Since there are often uncertainties in parameter values used in the modelling, please conduct a sensitivity analysis of modelling parameters on the results.

    f. Since the results presented in this ACS are based on the effluent discharge rate of 42 L/S, this value would be set as the maximum daily effluent discharge rate under the proposed expansion for the Environmental Compliance Approval (ECA) amendment.

    g. The proposed effluent limits and objectives are considered protective of the environment based on the modelling results presented in this report. However, the final approval is pending on responses for the comments #9b, 9c, 9d and 9e above.

10) The ESR suggests that the ultimate design flow for the WWTF expansion is estimated to be average 7500 m3/day, to be implemented in stages. However, the ACS submitted is for the initial increase in the effluent discharge flow up to 42 L/s (3628 m3/day). Therefore, please note that the ministry's tentative acceptance of this ACS would be conditional for the effluent discharge flow of 42 L/s (3628 m3/day). Any increase in the flow would require further

assessment of assimilative capacity of the receiver, Lake Erie, which currently has limited capacity to assimilate total phosphorus as realised in the current ACS. It should be noted that acceptance of this ESR does not inherently guarantee the approval of a future ECA amendment to allow the additional effluent discharge into Lake Erie exceeding the average daily rate of 3628 m3/day. A review by the ministry's Technical Support Staff is only one of many components of the ECA amendment/approval process.

11) Review of the design projections and calculations for the proposed expansion presented in Section 8 (Conceptual Design) of the ESR are deferred to the ministry's Wastewater Engineer.

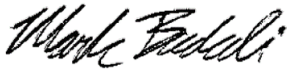
12) The mitigation measures for protection of fish and fish habitat as well as Sediment and Erosion Control that are proposed for the construction and operation of the WWTF expansion are adequate.

13) Portions of the Colchester South service area fall within a Surface Water Intake Protection Zone IPZ-2, which includes the on- and off-shore areas where flowing water and any pollution would reach the intake pipe within two hours. The ministry agrees that the proposed work may require approval by the Essex Region Risk Management Official to ensure that threats to potential drinking water are mitigated.

Thank you for circulating this draft Report for the ministry's consideration. Please document the provision of the draft Report to the ministry as well as this Project Review Unit Comments letter in the final report, and please provide an accompanying response letter to support our review of the final report. A copy of the final Notice should be sent to the ministry's Southwest Region EA notification email account (eanotification.swregion@ontario.ca).

Should you or any members of your project team have any questions regarding the material above, please contact me at mark.badali1@ontario.ca.

Sincerely,



Mark Badali
Senior Project Evaluator
Environmental Assessment Program Support, Environmental Assessment Branch
Ontario Ministry of the Environment, Conservation and Parks

cc Marcelina Wilson, Supervisor, Windsor Area Office, MECP
Marc Bechard, Water Compliance Supervisor, Sarnia District Office, MECP
David McBeth, Manager, Capital Works and Asset Management, Town of Essex
Kevin Girard, Director, Infrastructure Services, Town of Essex
Jian Li, Project Manager, Stantec Consulting Ltd.

Stantec Consulting Ltd.
100-140 Ouellette Place, Windsor ON N8X 1L9

July 13, 2023
File: 165620266

Attention: Mr. Mark Badali, Senior Project Evaluator

Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue W, 1st Floor
Toronto ON, M4V 1P5

Dear Mr. Badali,

Reference: Colchester South Sewage Works Expansion, Town of Essex
Municipal Class Environmental Assessment – Schedule C Project Review Comments – Draft Environmental Study Report

Thank you for your review and comments on the May 30, 2023, 'Draft' Environmental Study report for the Colchester South Sewage Works Expansion, Town of Essex. The following is in response to your comments on the Class EA, which was received on June 27, 2023.

General

1. *Section 1.2.1 of the ESR states, "As part of the Class EA procedure, the proponent is required to state how the project is to proceed and gain approval under the Act. There are four approval mechanisms available to the proponent under the Class*
    a. *The ministry notes that while the Municipal Class EA process is approved under the Environmental Assessment Act (EAA), projects included within the Class EA may be implemented without further approval under the EAA provided that the appropriate approved Class EA planning process is followed.*
    b. *Following the above-mentioned statement, the ESR lists three classifications of undertakings, Eligible for Screening to Exempt, Schedule B, and Schedule C, despite having just noted that there are "…four approval mechanisms available…".*

Response: The wording in this section was updated to note that provided the approved planning process is followed, projects included within the Class EA may be implemented without further approval under the Act.

The following correction was made to this section, "As part of the Class EA procedure, the proponent is required to state how the project is to proceed and gain approval under the Act. There are ~~four~~ **three** approval mechanisms available to the proponent under the Class EA:".

2. *In order to reflect the 2023 amended version of the Municipal Class EA that is referenced in section 1.2.1 of the ESR, the ministry recommends revising section 1.2.2 from, "Phase 2 – Identification of alternative solutions to the problem…, and identification of the project as a Schedule A, A+, B or C activity." to, "Phase 2 – Identification of alternative solutions to the problem…, and identification of the project as Exempt, Eligible for Screening to Exempt, or a Schedule B or C activity."*

Response: Section 1.2.2 was updated to reflect the 2023 MCEA Amendment.

3. *In the Indigenous Consultation Log in Appendix D of the ESR, every row that documents correspondence of the 2nd Open House states, "The 1st Open House was held on March 22nd,*

Reference: **Colchester South Sewage Works Expansion, Town of Essex Municipal Class Environmental Assessment – Schedule C Project Review Comments – Draft Environmental Study Report**

2023." The ministry presumes that these statements should be corrected to, "The 2nd Open House was held on March 22nd, 2023."

Response: The statements regarding the 2nd Open House in the Indigenous Consultation Log in Appendix D were corrected.

4. *Section 3.2.5 of the Appendix E: Natural Heritage Impact Assessment Report for the ESR states, "The list of SAR identified as potentially present in the Study Area is provided in Table." Presumably, this should be corrected to reference Table 4.*

Response: The reference to Table 4 was made in Section 3.2.5 of Appendix E: Natural Heritage Impact Assessment Report.

Planning and Policy

5. *Sections 9.2.1 and 9.2.11 of the ESR discuss how policies of the Provincial Policy Statement (PPS) relate to this project's potential environmental impacts on the aquatic and terrestrial habitat and climate change. As noted in Section C.1.1 of the Municipal Class EA document, the PPS is a key consideration for identifying land-use planning objectives and evaluating alternative solutions in Phases 2 and 3 of the Class EA process for water/wastewater projects. Please be advised that it is the ministry's preference that reports documenting the Municipal Class EA process include a distinct section to discuss the provincial planning and policy context for the project, particularly the Provincial Policy Statement, 2020.*

Response: A new section was added in the draft ESR to discuss the Provincial Policy Statement, (2020).

6. *Section 9.2.11 of the ESR references the Provincial Policy Statement (2014). Please ensure that the ESR includes a discussion on any relevant changes that came into effect in 2020, when the Provincial Policy Statement was last updated.*

Response: Section 9.2.1.1 of the draft ESR was updated to include information from the Provincial Policy Statement, (2020).

Indigenous Consultation

7. *The proponent should continue to engage with all communities that have been engaged with to date as the Class EA process proceeds.*

Response: The following communities have been included in the list of stakeholders identified as potentially affected by the proposed project:

- Aamjiwnaang First Nation
- Bkejwanong (Walpole Island)
- Caldwell First Nation
- Chippewas of Kettle and Stoney Point
- Chippewas of the Thames First Nation
- Oneida Nation of the Thames First Nation

Consultation with these communities will continue as the Class EA process proceeds.

Reference: **Colchester South Sewage Works Expansion, Town of Essex Municipal Class Environmental Assessment – Schedule C Project Review Comments – Draft Environmental Study Report**

Monitoring

8. *The ministry recommends that a discrete section be added to the ESR that discusses development and implementation of a monitoring program, as described in section A.4.2.1 of the Municipal Class EA parent document. Where possible, the program should monitor and review the environmental impacts predicted and the commitments made to mitigation throughout the planning and design process, and describe how unexpected environmental effects identified during the monitoring program will be addressed.*

Response: A new section was added to the draft ESR that discusses the development of a monitoring program; the specific monitoring requirements will be determined during the detailed design stage.

Surface Water

9 a*. The approach taken to assess assimilative capacity of the receiver, Lake Erie, is reasonable and acceptable according to the guidance provided in the ministry's Procedure B-1-5 (MOE 1994b).*

Response: Acknowledged. Thank you.

9 b. *Water quality data to analyze background water quality of Lake Erie were taken from the Lake Erie Water Quality Monitoring database (Great Lakes Data Stream 2023) for stations 971, 971A, 1297, 1328, 1461, and 1466. Please provide all water quality monitoring data used in this ACS.*

Response: Please see **Appendix A** with the raw water quality data that was used in the ACS.

9 c. *It was noted that station #1466 is spatially closest to the outfall location and technically should only be used for assessing background water quality of the receiver at the effluent discharge location. Please provide rationale for using data from multiple monitoring stations for this purpose. If the water quality data only from station #1466 were to use in the assessment of ambient water quality, please provide an explanation of how that would affect the final results of the ACS and more importantly the values of proposed effluent limits and objectives. It would be more interesting to see if TP data for station #1466 would still characterize the receiver as policy 1.*

Response: Appendix A presents the raw water quality data that was used in the ACS. Station #1466 has only two samples between 2000 and 2021, which is insufficient for any statistical analysis, therefore, other neighboring stations were added to our statistical analysis.

9 d. *Please provide parameter values (more specifically pH and temperature) used in the analysis of unionized ammonia for both summer and winter worse-case scenarios.*

Response: Please see Section 4.2.4 of the report: "In summer, the 75th percentile of water temperature in the lake is 23.9 ºC and pH is 8.55. In wintertime, water temperature in the lake is 5 ºC and pH is 8.3. The ambient 75th percentile concentration of total ammonia is 0.017 mg/L".

Reference: **Colchester South Sewage Works Expansion, Town of Essex Municipal Class Environmental Assessment – Schedule C Project Review Comments – Draft Environmental Study Report**

9 e. Since there are often uncertainties in parameter values used in the modelling, please conduct a sensitivity analysis of modelling parameters on the results.

Response:
Sensitivity analysis aims to describe how model output is affected by changes in model input values. Sensitivity analysis is an important part of model calibration. The most and least sensitive parameters affecting the size of the mixing zone in CORMIX were identified. Key parameters in the dilution and mixing model are related to effluent flow rate, bathymetry, ambient velocity, wind, and bottom roughness. A change in parameter values of +/- 10% was used in the sensitivity analysis. The results of the sensitivity analysis are presented in **Tables 1** to **5**. The most sensitive parameter that impacts the results is the effluent flow rate. It was found that an increase in effluent flow of 10% results in insignificant changes (<3%) in dilution in a 50 m mixing zone. However, the further away from the outfall, the greater the impact of the effluent rate, which results in a 29% reduction in dilution at 100 m. Water depth and ambient velocity are also relatively sensitive parameters. A 10% change in Manning's *n* and wind speed has no appreciable impact on the results. Though effluent flow rate, ambient velocity, and bathymetry have relatively high sensitivity, they are derived based on empirical observations, and their uncertainty is relatively low. Results presented in the AC study are based on conservative modelling conditions (e.g., low lake levels, low velocities in the receiver, high effluent rate, and ignoring decay, sedimentation, and bioaccumulation) and sensitive parameters used in the modeling have relatively low uncertainty. Therefore, the results are considered conservative and representative of the modeled conditions.

Table 1. Sensitivity Analysis (10% Change of Effluent Flow)

Scenario	Distance from Diffuser and Dilution Ratio							
	1 m	2 m	5 m	10 m	25 m	50 m	75 m	100 m
Effluent Flow, 37.8 L/s	22.3	31.2	48.8	54.8	60.0	93.0	135.1	182.1
Effluent Flow, 42 L/s	21.5	30.0	46.9	52.8	58.1	66.0	94.3	133.5
Effluent Flow, 46.2 L/s	20.8	29.0	45.3	51.2	56.6	64.7	71.9	94.6

Table 2. Sensitivity Analysis (10% Change of Ambient Velocity)

Scenario	Distance from Diffuser and Dilution Ratio							
	1 m	2 m	5 m	10 m	25 m	50 m	75 m	100 m
Water Depth at Outfall, 4.32 m	20.0	28.0	43.6	49.2	54.3	61.9	72.0	105.7
Water Depth at Outfall, 4.8 m	21.5	30.0	46.9	52.8	58.1	66.0	94.3	133.5
Water Depth at Outfall, 5.28 m	22.9	32.0	50.0	56.3	61.8	77.6	117.5	162.2

Table 3. Sensitivity Analysis (10% Change of Ambient Velocity)

Scenario	Distance from Diffuser and Dilution Ratio							
	1 m	2 m	5 m	10 m	25 m	50 m	75 m	100 m
Ambient Velocity, 0.018 m/s	20.7	28.9	45.2	51.0	56.5	64.6	71.8	92.5
Ambient Velocity, 0.02 m/s	21.5	30.0	46.9	52.8	58.1	66.0	94.3	133.5
Ambient Velocity, 0.022 m/s	22.3	31.1	48.6	54.6	59.8	86.9	124.0	165.1

Reference: **Colchester South Sewage Works Expansion, Town of Essex Municipal Class Environmental Assessment – Schedule C Project Review Comments – Draft Environmental Study Report**

Table 4. Sensitivity Analysis (10% Change of Manning's n)

Scenario	Distance from Diffuser and Dilution Ratio							
	1 m	2 m	5 m	10 m	25 m	50 m	75 m	100 m
Manning 's n, 0.027	21.5	30.0	46.9	52.8	58.1	66.0	94.3	133.5
Manning 's n, 0.03	21.5	30.0	46.9	52.8	58.1	66.0	94.3	133.5
Manning 's n, 0.033	21.5	30.0	46.9	52.8	58.1	66.0	94.3	133.5

Table 5. Sensitivity Analysis (10% Change of Wind Speed)

Scenario	Distance from Diffuser and Dilution Ratio							
	1 m	2 m	5 m	10 m	25 m	50 m	75 m	100 m
Wind Speed, 3.87 m/s	21.5	30.0	46.9	52.8	58.1	66.0	94.3	133.5
Wind Speed, 4.3 m/s	21.5	30.0	46.9	52.8	58.1	66.0	94.3	133.5
Wind Speed, 4.73 m/s	21.5	30.0	46.9	52.8	58.1	66.0	94.3	133.5

9 f. Since the results presented in this ACS are based on the effluent discharge rate of 42 L/S, this value would be set as the maximum daily effluent discharge rate under the proposed expansion for the Environmental Compliance Approval (ECA) amendment.

Response: Noted.

9 g. The proposed effluent limits and objectives are considered protective of the environment based on the modelling results presented in this report. However, the final approval is pending on responses for the comments #9b, 9c, 9d and 9e above.

Response: Acknowledged. Thank you.

Stantec Consulting Ltd.

Hannah Rindlisbacher B.A.Sc., E.I.T.
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Igor Iskra, Ph.D., P.Eng.
Associate, Senior Water Resources Engineer
Phone: 289-923-7237
igor.iskra@stantec.com

c. Mr. David McBeth, Manager, Capital Works & Asset Management, Town of Essex

From:	Badali, Mark (MECP)
To:	Rindlisbacher, Hannah
Cc:	Li, Jian; Iskra, Igor; McBeth, David; Girard, Kevin; Wilson, Marcelina (MECP); Bechard, Marc (MECP)
Subject:	RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report
Date:	Wednesday, August 9, 2023 7:51:01 AM
Attachments:	165620266 Responses to MECP Comments_July 13_.pdf Appendix A - WQ Data Lake Erie 2000-2021.pdf

Hi Hannah,

The ministry has reviewed the attached responses and anticipates having no further questions or concerns, provided that the draft ESR is updated as described.

With respect to surface water, the ministry's technical support staff is satisfied with the dataset provided and the outcomes of the sensitivity analysis conducted for the modelling exercise. Overall, the results of the Assimilative Capacity Study and proposed effluent objectives/limits are considered protective of the environment and are recommended for the ECA amendment for the proposed WWTP expansion.

I look forward to receipt of the Notice of Completion at the ministry's Southwest Region Class EA email inbox, at which time the ministry will review how the described responses have been integrated into the final ESR.

Best regards,

Mark Badali (he/him) | Senior Project Evaluator
Environmental Assessment Program Support | Environmental Assessment Branch
Ontario Ministry of the Environment, Conservation and Parks
Mark.Badali1@ontario.ca | (416) 457-2155

From: Badali, Mark (MECP)
Sent: August 4, 2023 2:55 PM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Hi Hannah,

Thank you for this follow-up.

I need to update the anticipated date for our feedback on Stantec's responses to Tuesday, August 8th, end of day. Apologies for the delay in our review.

Thank you,

Mark Badali (he/him) | Senior Project Evaluator
Environmental Assessment Program Support | Environmental Assessment Branch
Ontario Ministry of the Environment, Conservation and Parks

Mark.Badali1@ontario.ca | (416) 457-2155

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: August 4, 2023 2:34 PM
To: Badali, Mark (MECP) <Mark.Badali1@ontario.ca>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Mark,

Just following up to see when we can expect the MECP's feedback.

Thanks,

Hannah Rindlisbacher E.I.T., LEED Green Associate
Environmental Engineer in Training

Direct: 226-704-3060
Fax: 519-966-2253
hannah.rindlisbacher@stantec.com

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100-2555 Ouellette Avenue
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From: Badali, Mark (MECP) <Mark.Badali1@ontario.ca>
Sent: Wednesday, July 26, 2023 9:12 AM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Hi Hannah,

Thank you for sharing the responses to MECP's comments on the draft ESR and ACS.

MECP is intending to provide any feedback we may have on these responses by August 4, 2023. Please let me know if that works with the timeline of this project.

Best regards,

Mark Badali (he/him) | Senior Project Evaluator
Environmental Assessment Program Support | Environmental Assessment Branch
Ontario Ministry of the Environment, Conservation and Parks
Mark.Badali1@ontario.ca | (416) 457-2155

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: July 24, 2023 11:27 AM
To: Badali, Mark (MECP) <Mark.Badali1@ontario.ca>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

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Good morning Mark,

Do you have an estimate of when the MECP will be able provide an update on the draft ESR and ACS?

Thanks,

Hannah Rindlisbacher E.I.T., LEED Green Associate
Environmental Engineer in Training

Direct: 226-704-3060
Direct: 519-966-2250 ext
hannah.rindlisbacher@stantec.com

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From: Rindlisbacher, Hannah
Sent: Friday, July 14, 2023 4:36 PM
To: Badali, Mark (MECP) <Mark.Badali1@ontario.ca>
Cc: Li, Jian <jian.li@stantec.com>; Iskra, Igor <Igor.Iskra@stantec.com>; McBeth, David <dmcbeth@essex.ca>; Girard, Kevin <kgirard@essex.ca>; Wilson, Marcelina (MECP) <Marcelina.Wilson@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental

Study Report

Hi Mark,

Thank you for your review of the draft Environmental Study Report and Assimilative Capacity Study for the Colchester South Sewage Works Expansion project. Please see the attached for our response to your comments.

Have a great weekend,

Hannah Rindlisbacher E.I.T., LEED Green Associate
Environmental Engineer in Training

Direct: 226-704-3060
Direct: 519-966-2250 ext
hannah.rindlisbacher@stantec.com

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From: Badali, Mark (MECP) <Mark.Badali1@ontario.ca>
Sent: Tuesday, June 27, 2023 12:24 PM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Cc: Li, Jian <jian.li@stantec.com>; Iskra, Igor <Igor.Iskra@stantec.com>; McBeth, David <dmcbeth@essex.ca>; Girard, Kevin <kgirard@essex.ca>; Wilson, Marcelina (MECP) <Marcelina.Wilson@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Hi Hannah,

Thank you for your follow-up email.

In response to the draft Environmental Study Report and Assimilative Capacity Study provided for the Colchester South Sewage Works Expansion project (Municipal Class EA, Schedule C) being completed by the Town of Essex, please find the ministry's comments attached for your consideration.

Thank you for providing the ministry with an opportunity to comment on the above noted draft Report.

Best regards,

Mark Badali (he/him) | Senior Project Evaluator
Environmental Assessment Program Support | Environmental Assessment Branch
Ontario Ministry of the Environment, Conservation and Parks
Mark.Badali1@ontario.ca | (416) 457-2155

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: June 27, 2023 10:22 AM
To: Badali, Mark (MECP) <Mark.Badali1@ontario.ca>
Cc: Li, Jian <jian.li@stantec.com>; Iskra, Igor <Igor.Iskra@stantec.com>; McBeth, David <dmcbeth@essex.ca>; Girard, Kevin <kgirard@essex.ca>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Good morning Mark,

I just wanted to follow up on this review. When do you expect to return the MECP's comments on the draft ESR and Assimilative Capacity Study?

We were hoping to finalize the ESR for this Friday, June 30th.

Thanks,

Hannah Rindlisbacher E.I.T., LEED Green Associate
Environmental Engineer in Training

Direct: 226-704-3060
Direct: 519-966-2250 ext
hannah.rindlisbacher@stantec.com

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From: Badali, Mark (MECP) <Mark.Badali1@ontario.ca>
Sent: Friday, June 2, 2023 12:10 PM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Cc: Li, Jian <jian.li@stantec.com>; Iskra, Igor <Igor.Iskra@stantec.com>; McBeth, David <dmcbeth@essex.ca>; Girard, Kevin <kgirard@essex.ca>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Hi Hannah,

Thank you for providing this draft Environmental Study Report of the above-noted Class EA project for the ministry's consideration, in advance of the final Notice of Completion. I was able to successfully download the report. I will coordinate the ministry's review and aim to return any comments that we may have both on this ESR and on the Assimilative Capacity Study report provided previously on April 18th.

I anticipate that the earliest I can return MECP comments will be **Monday, June 26th**, given the current capacity of our technical review staff. Would this extension be acceptable for the Town's timeline?

Thank you,

Mark Badali (he/him) | Senior Project Evaluator
Environmental Assessment Program Support | Environmental Assessment Branch
Ontario Ministry of the Environment, Conservation and Parks
Mark.Badali1@ontario.ca | (416) 457-2155

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: May 30, 2023 1:32 PM
To: Badali, Mark (MECP) <Mark.Badali1@ontario.ca>
Subject: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Dear Mark,

The Town of Essex initiated a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the expansion of the existing Colchester South Sewage Works to accommodate ongoing and future development within the community. This study will satisfy Phases 1, 2, 3 and 4 of the Class EA process which will involve the evaluation of alternative solutions and design concepts, and selection of the preferred design for the proposed Colchester South Sewage Works Expansion. This "Draft" Environmental Study Report was prepared to document the activities and recommendations from the Class EA process.

The Town is looking for comments and feedback on the "Draft" Environmental Study Report from review agencies and Indigenous communities. In an effort to conserve paper and reduce printing costs, the report is being distributed in electronic format.

Please visit the following link and login information to access the report:

Login Information
FTP link: https://tmpsftp.stantec.com
Login name: s0606110854
Password: 8974393
Disk Quota: 20 GB
Expiry Date: 6/13/2023

Additional project details are available on the Town's project webpage: Colchester South Sewage Works Expansion - Town of Essex

If you have any comments or concerns regarding this "Draft" Environmental Study Report, please contact the undersigned. We would appreciate receiving any comments on the draft report by June 16th, 2023.

Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T., LEED Green Associate
Process Engineer in Training

Direct: 226-704-3060
Direct: 519-966-2250 ext
hannah.rindlisbacher@stantec.com

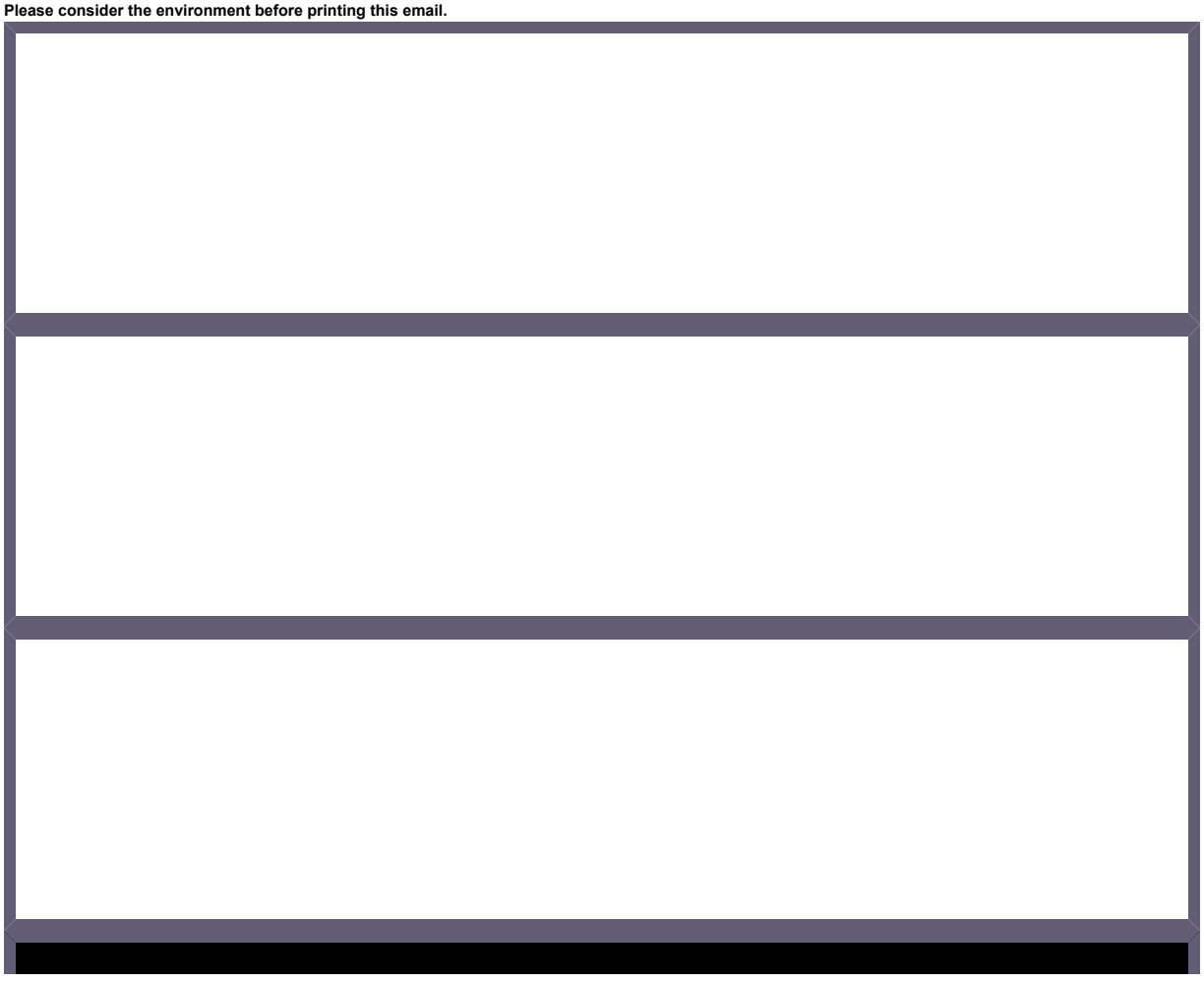
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APPENDIX A. WATER QUALITY DATA

ID	Lake	Latitude	Longitude	NAD	StartDate	Depth	tUnit	Characteristic	Speciation	SampleFraction	Result	Unit	# Samples	Min	Max	Average	75th %
971	Lake Erie	41.95	-83.05	NAD83	2002-04-18	-1	m	Ammonia	as N	Filtered, field	0.008	mg/L	**10**	**0.004**	**0.065**	**0.016**	**0.017**
971	Lake Erie	41.95	-83.05	NAD83	2006-04-27	-1	m	Ammonia	as N	Filtered, field	0.014	mg/L					
971	Lake Erie	41.95	-83.05	NAD83	2007-04-19	-1	m	Ammonia	as N	Filtered, field	0.023	mg/L					
971	Lake Erie	41.95	-83.05	NAD83	2009-04-20	-1	m	Ammonia	as N	Filtered, field	0.018	mg/L					
971	Lake Erie	41.95	-83.05	NAD83	2012-05-01	-1	m	Ammonia	as N	Filtered, field	0.005	mg/L					
971	Lake Erie	41.95	-83.05	NAD83	2013-04-24	-1	m	Ammonia	as N	Filtered, field	0.065	mg/L					
971	Lake Erie	41.95	-83.05	NAD83	2014-05-02	-1	m	Ammonia	as N	Filtered, field	0.01	mg/L					
971	Lake Erie	41.95	-83.05	NAD83	2015-04-29	-1	m	Ammonia	as N	Filtered, field	0.004	mg/L					
971	Lake Erie	41.95	-83.05	NAD83	2016-05-13	-1	m	Ammonia	as N	Filtered, field	0.006	mg/L					
971	Lake Erie	41.95	-83.05	NAD83	2019-04-30	-1	m	Ammonia	as N	Filtered, field	0.004	mg/L					
971	Lake Erie	41.95	-83.05	NAD83	2000-09-01	-7	m	pH			8.71	None	**44**	**7.67**	**8.86**	**8.34**	**8.55**
971	Lake Erie	41.95	-83.05	NAD83	2000-09-01	-1	m	pH			8.65	None					
971	Lake Erie	41.95	-83.05	NAD83	2002-04-18	-1	m	pH			8.05	None					
971	Lake Erie	41.95	-83.05	NAD83	2002-08-02	-6.5	m	pH			8.34	None					
971	Lake Erie	41.95	-83.05	NAD83	2002-08-02	-1	m	pH			8.36	None					
971	Lake Erie	41.95	-83.05	NAD83	2004-08-20	-7	m	pH			8.3	None					
971	Lake Erie	41.95	-83.05	NAD83	2004-08-20	-1	m	pH			8.31	None					
971	Lake Erie	41.95	-83.05	NAD83	2006-04-27	-1	m	pH			7.99	None					
971	Lake Erie	41.95	-83.05	NAD83	2006-08-03	-1	m	pH			8.13	None					
971	Lake Erie	41.95	-83.05	NAD83	2007-04-19	-1	m	pH			7.67	None					
971	Lake Erie	41.95	-83.05	NAD83	2009-04-20	-1	m	pH			8.29	None					
971	Lake Erie	41.95	-83.05	NAD83	2009-07-29	-1	m	pH			8.4	None					
971	Lake Erie	41.95	-83.05	NAD83	2010-07-30	-1	m	pH			8.22	None					
971	Lake Erie	41.95	-83.05	NAD83	2012-05-01	-1	m	pH			7.82	None					
971	Lake Erie	41.95	-83.05	NAD83	2012-07-23	-1	m	pH			8.16	None					
971	Lake Erie	41.95	-83.05	NAD83	2013-04-24	-1	m	pH			7.73	None					
971	Lake Erie	41.95	-83.05	NAD83	2013-07-31	-1	m	pH			8.16	None					
971	Lake Erie	41.95	-83.05	NAD83	2014-05-02	-1	m	pH			7.78	None					
971	Lake Erie	41.95	-83.05	NAD83	2014-07-21	-7	m	pH			8.48	None					
971	Lake Erie	41.95	-83.05	NAD83	2014-07-21	-1	m	pH			8.41	None					
971	Lake Erie	41.95	-83.05	NAD83	2015-04-29	-1	m	pH			8.38	None					
971	Lake Erie	41.95	-83.05	NAD83	2015-07-20	-1	m	pH			8.62	None					
971	Lake Erie	41.95	-83.05	NAD83	2016-05-13	-1	m	pH			8.09	None					
971	Lake Erie	41.95	-83.05	NAD83	2016-07-11	-1	m	pH			8.48	None					
971	Lake Erie	41.95	-83.05	NAD83	2017-02-10	-7	m	pH			8.56	None					
971	Lake Erie	41.95	-83.05	NAD83	2017-02-10	-1	m	pH			8.6	None					
971	Lake Erie	41.95	-83.05	NAD83	2017-02-10	-0.5	m	pH			8.62	None					
971A	Lake Erie	41.9997	-83.0575	NAD83	2017-02-10	-4.5	m	pH			8.55	None					
971A	Lake Erie	41.9997	-83.0575	NAD83	2017-02-10	-1	m	pH			8.53	None					
971A	Lake Erie	41.9997	-83.0575	NAD83	2017-02-10	-0.5	m	pH			8.43	None					
1461	Lake Erie	41.9481	-82.9817	NAD83	2017-05-10	-7.5	m	pH			8.4	None					
1461	Lake Erie	41.9481	-82.9817	NAD83	2017-05-10	-1	m	pH			8.42	None					
1461	Lake Erie	41.9481	-82.9817	NAD83	2017-05-10	-0.5	m	pH			8.44	None					
1297	Lake Erie	42.0367	-83.1344	NAD83	2017-06-10	-7.5	m	pH			8.1	None					
1297	Lake Erie	42.0367	-83.1344	NAD83	2017-06-10	-1	m	pH			8.05	None					
1466	Lake Erie	41.9972	-82.9806	NAD83	2017-06-10	-5.5	m	pH			8.65	None					
1466	Lake Erie	41.9972	-82.9806	NAD83	2017-06-10	-1	m	pH			8.64	None					
1466	Lake Erie	41.9972	-82.9806	NAD83	2017-06-10	-0.5	m	pH			8.68	None					
971	Lake Erie	41.95	-83.05	NAD83	2017-07-31	-1	m	pH			8.86	None					
971	Lake Erie	41.95	-83.05	NAD83	2018-08-30	-0.1	m	pH			8.28	None					
971	Lake Erie	41.95	-83.05	NAD83	2019-04-30	-1	m	pH			8.29	None					
971	Lake Erie	41.95	-83.05	NAD83	2019-07-31	-7.5	m	pH			8.4	None					
971	Lake Erie	41.95	-83.05	NAD83	2019-07-31	-1	m	pH			8.46	None					
971	Lake Erie	41.95	-83.05	NAD83	2021-09-10	-1	m	pH			8.56	None					
971	Lake Erie	41.95	-83.05	NAD83	2000-09-01	0	m	Temperature, water			24.3	deg C	**34**	**5.0**	**27.1**	**18.1**	**23.9**
971	Lake Erie	41.95	-83.05	NAD83	2002-04-18	0	m	Temperature, water			13.8	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2002-08-02	0	m	Temperature, water			26.1	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2004-06-23	0	m	Temperature, water			20.6	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2004-08-20	0	m	Temperature, water			21.2	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2004-10-20	0	m	Temperature, water			11.5	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2006-04-27	0	m	Temperature, water			12.8	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2006-08-03	0	m	Temperature, water			27.1	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2007-04-19	0	m	Temperature, water			5	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2009-04-20	0	m	Temperature, water			6	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2009-07-29	0	m	Temperature, water			23.4	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2010-07-30	0	m	Temperature, water			25.5	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2012-05-01	0	m	Temperature, water			10.9	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2012-05-10	0	m	Temperature, water			13.3	deg C					
1328	Lake Erie	41.9186	-82.9717	NAD83	2012-05-11	0	m	Temperature, water			13	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2012-07-23	0	m	Temperature, water			25.7	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2013-04-24	0	m	Temperature, water			7.5	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2013-07-31	0	m	Temperature, water			22.3	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2014-05-02	0	m	Temperature, water			9.7	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2014-07-21	0	m	Temperature, water			24.2	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2015-04-29	0	m	Temperature, water			9	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2015-07-20	0	m	Temperature, water			23	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2016-05-13	0	m	Temperature, water			12	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2016-07-11	0	m	Temperature, water			24	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2017-02-10	0	m	Temperature, water			20	deg C					
971A	Lake Erie	41.9997	-83.0575	NAD83	2017-02-10	0	m	Temperature, water			19.5	deg C					
1461	Lake Erie	41.9481	-82.9817	NAD83	2017-05-10	0	m	Temperature, water			20.3	deg C					
1297	Lake Erie	42.0367	-83.1344	NAD83	2017-06-10	0	m	Temperature, water			19	deg C					
1466	Lake Erie	41.9972	-82.9806	NAD83	2017-06-10	0	m	Temperature, water			20.8	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2017-07-31	0	m	Temperature, water			23.5	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2018-08-30	0	m	Temperature, water			24.5	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2019-04-30	0	m	Temperature, water			7	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2019-07-31	0	m	Temperature, water			25.2	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2021-09-10	0	m	Temperature, water			22	deg C					
971	Lake Erie	41.95	-83.05	NAD83	2000-09-01	-7	m	Total Phosphorus, as P		Unfiltered	0.0129	mg/L	**42**	**0.0054**	**0.0642**	**0.0148**	**0.0151**

971	Lake Erie	41.95	-83.05	NAD83	2000-09-01	-1	m	Total Phosphorus, as P	Unfiltered	0.013	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2002-04-18	-1	m	Total Phosphorus, as P	Unfiltered	0.0113	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2002-08-02	-6.5	m	Total Phosphorus, as P	Unfiltered	0.009	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2002-08-02	-1	m	Total Phosphorus, as P	Unfiltered	0.0098	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2004-08-20	-7	m	Total Phosphorus, as P	Unfiltered	0.0099	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2004-08-20	-1	m	Total Phosphorus, as P	Unfiltered	0.0106	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2006-04-27	-1	m	Total Phosphorus, as P	Unfiltered	0.0102	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2006-08-03	-1	m	Total Phosphorus, as P	Unfiltered	0.0109	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2007-04-19	-1	m	Total Phosphorus, as P	Unfiltered	0.0419	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2009-04-20	-1	m	Total Phosphorus, as P	Unfiltered	0.0642	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2009-07-29	-1	m	Total Phosphorus, as P	Unfiltered	0.0261	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2010-07-30	-1	m	Total Phosphorus, as P	Unfiltered	0.0104	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2012-05-01	-1	m	Total Phosphorus, as P	Unfiltered	0.0126	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2012-05-10	-6.5	m	Total Phosphorus, as P	Unfiltered	0.0126	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2012-05-10	-4.3	m	Total Phosphorus, as P	Unfiltered	0.0115	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2012-07-23	-1	m	Total Phosphorus, as P	Unfiltered	0.0079	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2013-04-24	-1	m	Total Phosphorus, as P	Unfiltered	0.0296	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2013-07-31	-1	m	Total Phosphorus, as P	Unfiltered	0.0094	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2014-05-02	-1	m	Total Phosphorus, as P	Unfiltered	0.0332	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2014-07-21	-7	m	Total Phosphorus, as P	Unfiltered	0.008	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2014-07-21	-1	m	Total Phosphorus, as P	Unfiltered	0.0079	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2015-04-29	-1	m	Total Phosphorus, as P	Unfiltered	0.0146	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2015-07-20	-1	m	Total Phosphorus, as P	Unfiltered	0.0072	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2016-05-13	-1	m	Total Phosphorus, as P	Unfiltered	0.0099	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2016-07-11	-1	m	Total Phosphorus, as P	Unfiltered	0.0084	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2017-02-10	-7	m	Total Phosphorus, as P	Unfiltered	0.0144	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2017-02-10	-1	m	Total Phosphorus, as P	Unfiltered	0.0153	mg/L				
971A	Lake Erie	41.9997	-83.0575	NAD83	2017-02-10	-4.5	m	Total Phosphorus, as P	Unfiltered	0.0131	mg/L				
971A	Lake Erie	41.9997	-83.0575	NAD83	2017-02-10	-1	m	Total Phosphorus, as P	Unfiltered	0.0118	mg/L				
1461	Lake Erie	41.9481	-82.9817	NAD83	2017-05-10	-7.5	m	Total Phosphorus, as P	Unfiltered	0.0172	mg/L				
1461	Lake Erie	41.9481	-82.9817	NAD83	2017-05-10	-1	m	Total Phosphorus, as P	Unfiltered	0.0164	mg/L				
1297	Lake Erie	42.0367	-83.1344	NAD83	2017-06-10	-7.5	m	Total Phosphorus, as P	Unfiltered	0.0054	mg/L				
1297	Lake Erie	42.0367	-83.1344	NAD83	2017-06-10	-1	m	Total Phosphorus, as P	Unfiltered	0.0059	mg/L				
1466	Lake Erie	41.9972	-82.9806	NAD83	2017-06-10	-5.5	m	Total Phosphorus, as P	Unfiltered	0.025	mg/L				
1466	Lake Erie	41.9972	-82.9806	NAD83	2017-06-10	-1	m	Total Phosphorus, as P	Unfiltered	0.0165	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2017-07-31	-1	m	Total Phosphorus, as P	Unfiltered	0.0122	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2018-08-30	-0.1	m	Total Phosphorus, as P	Unfiltered	0.0141	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2019-04-30	-1	m	Total Phosphorus, as P	Unfiltered	0.0156	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2019-07-31	-7.5	m	Total Phosphorus, as P	Unfiltered	0.0079	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2019-07-31	-1	m	Total Phosphorus, as P	Unfiltered	0.0092	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2021-09-10	-1	m	Total Phosphorus, as P	Unfiltered	0.0082	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2016-05-13	-1	m	Total suspended solids	Filtered, field	4.2	mg/L	**7**	**2.6**	**11.2**	**4.7**	**4.8**
971	Lake Erie	41.95	-83.05	NAD83	2016-07-11	-1	m	Total suspended solids	Filtered, field	2.87	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2017-07-31	-1	m	Total suspended solids	Filtered, field	3.8	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2018-08-30	-0.1	m	Total suspended solids	Filtered, field	5.4	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2019-04-30	-1	m	Total suspended solids	Filtered, field	11.2	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2019-07-31	-1	m	Total suspended solids	Filtered, field	2.6	mg/L				
971	Lake Erie	41.95	-83.05	NAD83	2021-09-10	-1	m	Total suspended solids	Filtered, field	2.85	mg/L				

From: Rindlisbacher, Hannah
To: Wing On Li; Edmunds, Kyle
Cc: Muir, Melanie; Li, Jian; McBeth, David
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report
Date: Thursday, June 22, 2023 9:53:00 AM
Attachments: image001.png

Hi Wing,

The Lypps Beach development is located in the original wastewater service area. Existing sewage works including sanitary sewers were sized with the use of 35 persons per hectare (for low-medium density residential). The density for individual developments is to be reviewed by the Town. However, with Bill 23, the total density of dwelling units is permitted to be 3 (2 in one building and 1 in a separate building if zoning regulations can be met), which helps justify the 35 persons per hectare.

Thanks,

Hannah Rindlisbacher B.A.Sc., E.I.T., LEED Green Associate
Process Engineer in Training

Direct: 226-704-3060
Direct: 519-966-2250 ext
hannah.rindlisbacher@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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Please consider the environment before printing this email.

From: Wing On Li <wingon.li@horizoninv.ca>
Sent: Tuesday, June 20, 2023 11:51 AM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>; Edmunds, Kyle <kedmunds@dillon.ca>
Cc: Muir, Melanie <mmuir@dillon.ca>; Li, Jian <jian.li@stantec.com>; McBeth, David <dmcbeth@essex.ca>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Hi, Hannah,
A quick question regarding Point 7: Who suggested that higher density dwellings could be allowed in the Lypps Beach development? The developer or the Town?
We were told that by the Town's Planning Manager that under the R.1 residential zoning, all lands lying in the Lakeshore West Corridor south of CR 50 are only permitted to have single detached homes. No rezoning for higher density dwellings would be allowed. We reckon the proposed 1,257 population is mere wishful thinking.

Wing On LI
CHIEF EXECUTIVE OFFICER/DIRECTOR
Email: wingon.li@horizoninv.ca
Cell: (647) 866-1200

HORIZON

HORIZONS GROUP SUBSIDIARIES:
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GANATCHIO GARDENS INC
LAKEFRONT HEIGHTS INC
EASTSIDE CONSTRUCTORS LTD
NEW HEAD OFFICE: 4510 RHODES DRIVE, SUITE 520, WINDSOR ON N8W 5K5
O: (226) 722-8328

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: Tuesday, June 20, 2023 10:22 AM
To: Edmunds, Kyle <kedmunds@dillon.ca>
Cc: Wing On Li <wingon.li@horizoninv.ca>; Muir, Melanie <mmuir@dillon.ca>; Li, Jian <jian.li@stantec.com>; McBeth, David <dmcbeth@essex.ca>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Hi Kyle,

Thank you for reviewing the draft ESR. Please see my responses to your questions below in blue font.

Thanks,

Hannah Rindlisbacher B.A.Sc., E.I.T., LEED Green Associate
Process Engineer in Training

Direct: 226-704-3060
Direct: 519-966-2250 ext
hannah.rindlisbacher@stantec.com

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From: Edmunds, Kyle <kedmunds@dillon.ca>
Sent: Friday, June 16, 2023 11:39 AM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Cc: Wing On Li <wingon.li@horizoninv.ca>; Muir, Melanie <mmuir@dillon.ca>
Subject: Re: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Good morning Hannah,

I have reviewed the document and overall agree with the approach and conclusions, but I do have a few questions and comments.

1. Section 2.4.2 - A sanitary sewer flow of 454 L/c/d was used. Was the actual water usage rate for Essex reviewed and considered? For example other Municipalities have a lower per capita flow rate.
   This section falls under '2.0 Existing Conditions' and refers to the design basis for the original sewage system design and construction in the 1980's. A sanitary sewage flow of 454 L/c/d is typical of MECP Design Guidelines and the Town of Essex Development Standards.

2. Table 2.2 - The 2021 Census Data for Essex states a 2.5 ppd. Would this value not be used for existing developed areas versus the 3.25 ppd? This section also falls under '2.0 Existing Conditions' and refers to the design basis for the original sewage system design and construction. The values in Table 2.2 were taken from the original sewage system design sheets in the 1980's which were likely standard values at the time based on MOE Design Guidelines.

3. Table 2.3. - Would the values in this table update if the above flow and population changes were made?
   Please refer to the response to question #1 and #2, these values will not be updated since they represent the original system design.

4. Table 2.6 - Should the equiv. population be 5,090 as shown in Table 2.3?
   The equivalent population of 5,090 was used in Table 2.3 as it corresponds to the equivalent population that Pumping Station No. 1 was designed for. Section 2.4.3 states, "Pumping Station No. 1 was designed to service an average sewage flow of 21 L/s, and total peak flow of 94 L/s (8.1 MLD) which corresponds to 5,090 equivalent persons".

   Although Pumping Station No.1 was designed for an equivalent population of 5,090, the existing lagoons were only designed to service an equivalent population of 4,000. Section 2.5.2 states, "The wastewater treatment facility was constructed in the 1980s, to service an equivalent population of 4,000 persons, with a rated capacity of 1,816 m^3/d."

5. Section 4.2.2.1 - Should the population be 5,090, this would be less than 454 L/c/d, but it was what the original design was based on.
   The existing lagoons were originally designed to service an equivalent population of 4,000. See response to question #4 for more detail.

6. Section 4.2.2.1 - An existing population of 2,334 persons with a 3yr avg of 1,062m3/d would yield a flowrate of 455 L/c/d, but would this include some I&I or cross connection flow. Could the existing flows per capita be less?
   The population of 2,334 is the 2021 population of Colchester as per The Canadian Census Program. The 3 year average (2019-2021) of 1,062 m^3/d was calculated based on flow monitoring data at the WWTP, it is likely this include some I&I or cross connection flow.

7. Table 5.1 - Estimated population for Lypps Beach appears to be quite high, considering approximately 30% of the site is PSW. This population would be more in the 600 range. This would change the Total Existing Service Area number.
   In the original sewer design sheets, the Lypps Beach Property was assigned an equivalent population based on the 35 ppl/ha regardless of the land type. Based on this the developer of the Lypps Beach Property would be allowed to develop the land for an equivalent population of 1,257. Although a significant portion of the land is PSW, upon the town's approval, the developer may choose to incorporate higher density dwellings on the allowable areas of this land up to an equivalent population of 1,257.

8. Table 5.3. - Existing Service Area would change if changes are made to Table 5.1.
   Please refer to the answer for question #7.

If you need to talk to get any clarification on the comments above, please feel free to contact me.

Regards,

Kyle Edmunds P.Eng.
Partner
Dillon Consulting Limited
3200 Deziel Drive Suite 608
Windsor, Ontario, N8W 5K8
T - 519.948.4243 ext. 3248
F - 519.948.5054
M - 519.818.4282

KEdmunds@dillon.ca
www.dillon.ca

On Tue, May 30, 2023 at 1:29 PM Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com> wrote:

> Dear Kyle,
>
> The Town of Essex initiated a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the expansion of the existing Colchester South Sewage Works to accommodate ongoing and future development within the community. This study will satisfy Phases 1, 2, 3 and 4 of the Class EA process which will involve the evaluation of alternative solutions and design concepts, and selection of the preferred design for the proposed Colchester South Sewage Works Expansion. This "Draft" Environmental Study Report was prepared to document the activities and recommendations from the Class EA process.
>
> The Town is looking for comments and feedback on the "Draft" Environmental Study Report from review agencies and Indigenous communities. In an effort to conserve paper and reduce printing costs, the report is being distributed in electronic format.
>
> Please visit the following link and login information to access the report:
>
> **Login Information**
> **FTP link:** https://tmpsftp.stantec.com
> **Login name:** s0606110854
> **Password:** 8974393
> **Disk Quota:** 20 GB
> **Expiry Date: 6/13/2023**
>
> Additional project details are available on the Town's project webpage: Colchester South Sewage Works Expansion - Town of Essex
> **If you have any comments or concerns regarding this "Draft" Environmental Study Report, please contact the undersigned. We would appreciate receiving any comments on the draft report by June 16th, 2023.**
>
> Sincerely,
>
> **Hannah Rindlisbacher** B.A.Sc., E.I.T., LEED Green Associate
> Process Engineer in Training
>
> Direct: 226-704-3060
> Direct: 519-966-2250 ext
> hannah.rindlisbacher@stantec.com
>
> Stantec
> 100-2555 Ouellette Avenue
> Windsor ON N8X 1L9
>
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APPENDIX D

Indigenous Consultation Log

Indigenous Consultation Log
Municipal Class Environmental Assessment
Colchester South Sewage Works Expansion, Town of Essex

Contact Information	Date/Method of Communication	Correspondence Received and/or Project Information Distributed	Consultant Response
Ministry of Indigenous Affairs Molly Mann molly.mann@ontario.ca Manager, Indigenous Relations Unit Heather Levecque heather.levecque@ontario.ca Director, Indigenous Relations Unit Suite 400, 160 Bloor Street East Toronto, ON M7A 2E6	**Notice of Commencement** Date: August 15th, 2022 Method: Via Email	The Notice of Commencement was sent to Molly Mann and Heather Levecque, on August 15th, 2022, via Email.	N/A
	1st Open House Date: October 18th, 2022 Method: Online and Email	The Notice of 1st Open House was published on the Town of Essex's Website on October 14th, 2022. The Notice of Open House was sent to Molly Mann and Heather Levecque on October 18th, 2022, via Email. The 1st Open House was held on October 26th, 2022.	N/A
	2nd Open House Date: March 9th, 2023 Method: Online and Email	The Notice of 2nd Open House was published on the Town of Essex's Website on March 9th, 2023. The Notice of Open House was sent to Molly Mann and Heather Levecque on March 9th, 2023, via Email. The 2nd Open House was held on March 22nd, 2023.	N/A
	Notice of Draft ESR Date: May 30th, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was sent to individual Indigenous communities to solicit comments and inputs on May 30th, 2023.	N/A
Southern First Nations Secretariat Ms. Jennifer Whiteye jenwhiteye@sfns.on.ca Executive Director 22361 Austin Line Bothwell, ON N0L 1Y0	**Notice of Commencement** Date: August 15th, 2022 Method: Via Email	The Notice of Commencement was sent to Jennifer Whiteye on August 15th, 2022, via Email.	N/A
	1st Open House Date: October 18th, 2022 Method: Online and Email	The Notice of 1st Open House was published on the Town of Essex's Website on October 14th, 2022. The Notice of Open House was sent to Jennifer Whiteye on October 18th, 2022, via Email. The 1st Open House was held on October 26th, 2022.	N/A
	2nd Open House Date: March 9th, 2023 Method: Online and Email	The Notice of 2nd Open House was published on the Town of Essex's Website on March 9th, 2023. The Notice of Open House was sent to Jennifer Whiteye on March 9th, 2023, via Email. The 2nd Open House was held on March 22nd, 2023.	N/A
	Notice of Draft ESR Date: May 30th, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was sent to individual Indigenous communities to solicit comments and inputs on May 30th, 2023.	N/A
Walpole Island First Nation / Bkejwanong Territory Dr. Dean Jacobs dean.jacobs@wifn.org Independent Consultant Janet MacBeth janet.macbeth@wifn.org Consultation Manager 117 Tahgahoning Road,R.R. #3 Wallaceburg, ON N8A 4K9	**Notice of Commencement** Date: August 15th, 2022 Method: Via Email	The Notice of Commencement was sent to Dr. Dean Jacobs and Janet MacBeth on August 15th, 2022, via Email.	N/A
	1st Open House Date: October 18th, 2022 Method: Online and Email	The Notice of 1st Open House was published on the Town of Essex's Website on October 14th, 2022. The Notice of Open House was sent to Dean Jacobs and Janet MacBeth on October 18th, 2022, via Email. The 1st Open House was held on October 26th, 2022.	N/A
	2nd Open House Date: March 9th, 2023 Method: Online and Email	The Notice of 2nd Open House was published on the Town of Essex's Website on March 9th, 2023. The Notice of Open House was sent to Dean Jacobs and Janet MacBeth on March 9th, 2023, via Email. The 2nd Open House was held on March 22nd, 2023.	N/A
	Notice of Draft ESR Date: May 30th, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was sent to individual Indigenous communities to solicit comments and inputs on May 30th, 2023.	N/A
Métis Nation of Ontario, Thames Bluewater Métis Council Kathleen Anderson	**Notice of Commencement** Date: August 15th, 2022 Method: Via Email	The Notice of Commencement was sent to Kathleen Anderson on August 15th, 2022, via Email.	N/A

Indigenous Consultation Log
Municipal Class Environmental Assessment
Colchester South Sewage Works Expansion, Town of Essex

Contact Information	Date/Method of Communication	Correspondence Received and/or Project Information Distributed	Consultant Response
tbwmc.president@gmail.com President 183 Summerset Crescent London, ON N6K 3S5	**1st Open House** Date: October 18th, 2022 Method: Online and Email	The Notice of 1st Open House was published on the Town of Essex's Website on October 14th, 2022. The Notice of Open House was sent Kathleen Anderson on October 18th, 2022, via Email. The 1st Open House was held on October 26th, 2022.	N/A
	2nd Open House Date: March 9th, 2023 Method: Online and Email	The Notice of 2nd Open House was published on the Town of Essex's Website on March 9th, 2023. The Notice of Open House was sent to Kathleen Anderson on March 9th, 2023, via Email. The 2nd Open House was held on March 22nd, 2023.	N/A
	Notice of Draft ESR Date: May 30th, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was sent to individual Indigenous communities to solicit comments and inputs on May 30th, 2023.	N/A
Caldwell First Nation Zack Hamm ecd.manager@caldwellfirstnation.ca Environment & Consultation Department Manager 14 Orange Street Leamington, ON N8H 1P5	**Notice of Commencement** Date: August 15th, 2022 Method: Via Online Consultation Tool	The Notice of Commencement was submitted online through the online consultation tool: www.consultwithcaldwell.ca on August 15th, 2022.	~~N/A~~
	1st Open House Date: October 18th, 2022 Method: Online Consultation Tool	The Notice of 1st Open House was published on the Town of Essex's Website on October 14th, 2022. The Notice of Open House was submitted to www.consultwithcaldwell.ca on October 18th, 2022, via email. The 1st Open House was held on October 26th, 2022.	N/A
	2nd Open House Date: March 9th, 2023 Method: Online and Email	The Notice of 2nd Open House was published on the Town of Essex's Website on March 9th, 2023. The Notice of Open House was submitted to www.consultwithcaldwell.ca on March 9th, 2023, via Email. The 2nd Open House was held on March 22nd, 2023.	N/A
	Notice of Draft ESR Date: May 30th, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was sent to individual Indigenous communities to solicit comments and inputs on May 30th, 2023.	On June 23rd, 2023, The Town of Essex signed a Technical Review Agreement with Caldwell First Nation for the review of the draft ESR. Zack Hamm provided comments on the draft ESR on August 11th, 2023. Response was sent to Caldwell First Nation on September 14th.
Aamjiwnaang First Nation Chris Plain cplain@aamjiwnaang.ca Chief Joanne Rogers jrogers@aamjiwnaang.ca Councillor Cathleen O'Brien cobrien@aamjiwnaang.ca Environmental Coordinator Courtney Jackson cjackson@aamjiwnaang.ca Environment Worker 978 Tashmoo Avenue Sarnia, ON N7T 7H5	**Notice of Commencement** Date: August 15th, 2022 Method: Via Email	The Notice of Commencement was sent to Chief Chris Plain, Joanne Rogers, Cathleen O'Brien and Courtney Jackson on August 15th, 2022, via Email.	N/A
	1st Open House Date: October 18th, 2022 Method: Online and Email	The Notice of 1st Open House was published on the Town of Essex's Website on October 14th, 2022. The Notice of Open House was sent to on October 18th, 2022, via Email. The 1st Open House was held on October 26th, 2022.	N/A
	2nd Open House Date: March 9th, 2023 Method: Online and Email	The Notice of 2nd Open House was published on the Town of Essex's Website on March 9th, 2023. The Notice of Open House was sent to Chris Plain, Joanne Rogers, Cathleen O'Brien and Courtney Jackson on March 9th, 2023, via Email. The 2nd Open House was held on March 22nd, 2023.	N/A
	Notice of Draft ESR Date: May 30th, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was sent to individual Indigenous communities to solicit comments and inputs on May 30th, 2023.	Aamjiwnaang First Nation requested a presentation at their Environment Committee Council Meeting. Stantec presented the findings of the draft ESR virtually at the August 15th, 2023 meeting. No additional comments were received following the meeting.

Indigenous Consultation Log
Municipal Class Environmental Assessment
Colchester South Sewage Works Expansion, Town of Essex

Contact Information	Date/Method of Communication	Correspondence Received and/or Project Information Distributed	Consultant Response
Delaware Nation (Moravian of the Thames) Denise Stonefish denise.stonefish@delawarenation.on.ca Chief 14760 School House Line Thamesville ON N0P 2K0	**Notice of Commencement** Date: August 15th, 2022 Method: via Email	The Notice of Commencement was sent to Denise Stonefish on August 15th, 2022, via Email.	N/A
	1st Open House Date: October 18th, 2022 Method: Online and Email	The Notice of 1st Open House was published on the Town of Essex's Website on October 14th, 2022. The Notice of Open House was sent to on October 18th, 2022, via Email. The 1st Open House was held on October 26th, 2022.	N/A
	2nd Open House Date: March 9th, 2023 Method: Online and Email	The Notice of 2nd Open House was published on the Town of Essex's Website on March 9th, 2023. The Notice of Open House was sent to Denise Stonefish on March 9th, 2023, via Email. The 2nd Open House was held on March 22nd, 2023.	N/A
	Notice of Draft ESR Date: May 30th, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was sent to individual Indigenous communities to solicit comments and inputs on May 30th, 2023.	N/A
Metis Nation of Ontario Margaret Froh margaretF@metisnation.org Director, Lands, Resources and Consultations 75 Sherbourne Street, Unit 311 Toronto ON M5A 2P9	**Notice of Commencement** Date: August 15th, 2022 Method: via Email	The Notice of Commencement was sent to Margaret Froh on August 15th, 2022, via Email.	N/A
	1st Open House Date: October 18th, 2022 Method: Online and Email	The Notice of 1st Open House was published on the Town of Essex's Website on October 14th, 2022. The Notice of Open House was sent to on October 18th, 2022, via Email. The 1st Open House was held on October 26th, 2022.	N/A
	2nd Open House Date: March 9th, 2023 Method: Online and Email	The Notice of 2nd Open House was published on the Town of Essex's Website on March 9th, 2023. The Notice of Open House was sent to Margaret Froh on March 9th, 2023, via Email. The 2nd Open House was held on March 22nd, 2023.	N/A
	Notice of Draft ESR Date: May 30th, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was sent to individual Indigenous communities to solicit comments and inputs on May 30th, 2023.	
Chippewas of Kettle and Stony Point First Nation Jason Henry Jason.Henry@kettlepoint.org Chief 6247 Indian Lane, R.R. #2 Forest, ON N0N 1J1	**Notice of Commencement** Date: August 15th, 2022 Method: via Email	The Notice of Commencement was sent to Jason Henry on August 15th, 2022, via Email.	N/A
	1st Open House Date: October 18th, 2022 Method: Online and Email	The Notice of 1st Open House was published on the Town of Essex's Website on October 14th, 2022. The Notice of Open House was sent to on October 18th, 2022, via Email. The 1st Open House was held on October 26th, 2022.	N/A
	2nd Open House Date: March 9th, 2023 Method: Online and Email	The Notice of 2nd Open House was published on the Town of Essex's Website on March 9th, 2023. The Notice of Open House was sent to Jason Henry on March 9th, 2023, via Email. The 2nd Open House was held on March 22nd, 2023.	N/A
	Notice of Draft ESR Date: May 30th, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was sent to individual Indigenous communities to solicit comments and inputs on May 30th, 2023.	
Chippewas of the Thames First Nation Jacqueline French jfrench@cottfn.com	**Notice of Commencement** Date: August 15th, 2022 Method: via Online Consultation Tool	The Notice of Commencement was sent to Chief Jacqueline French, Kelly Riley and Fallon Burch August 15th, 2022, via Email. The Notice of Commencement was also submitted to NationsConnect.ca on August 23rd, 2022.	

Indigenous Consultation Log
Municipal Class Environmental Assessment
Colchester South Sewage Works Expansion, Town of Essex

Contact Information	Date/Method of Communication	Correspondence Received and/or Project Information Distributed	Consultant Response
Chief Kelly Riley kriley@cottfn.com Director of Treaties, Lands & Environment Fallon Burch fburch@cottfn.com Consultation Coordinator 320 Chippewa Road Muncey, ON N0L 1Y0	**1st Open House** Date: October 18th, 2022 Method: Online and Email	The Notice of 1st Open House was published on the Town of Essex's Website on October 14th, 2022. The Notice of Open House October 18th, 2022, via Email. The 1st Open House was held on October 26th, 2022.	N/A
	2nd Open House Date: March 9th, 2023 Method: Online and Email	The Notice of 2nd Open House was published on the Town of Essex's Website on March 9th, 2023. The Notice of Open House was submitted to nationsconnect.ca on March 9th, 2023, via Email. The 2nd Open House was held on March 22nd, 2023.	N/A
	Notice of Draft ESR Date: May 30th, 2023 Method: Online	The access information to the electronic copy of draft ESR report, was submitted to nationsconnect.ca to solicit comments and inputs from Chippewas of the Thames First Nation on May 30th, 2023.	N/A
Oneida Nation of the Thames ONYOTA'A:KA Adrian Chrisjohn adrian.chrisjohn@oneida.on.ca Chief Cherilyn Hill cherilyn.hill@oneida.on.ca Political Office Manager 2212 Elm Avenue Southwold, ON N0L 2G0	**Notice of Commencement** Date: August 15th, 2022 Method: via Email	The Notice of Commencement was sent to Chief Adrian Chrisjohn and Cherilyn Hill on August 15th, 2022, via Email.	N/A
	1st Open House Date: October 18th, 2022 Method: Online and Email	The Notice of 1st Open House was published on the Town of Essex's Website on October 14th, 2022. The Notice of Open House was sent to on October 18th, 2022, via Email. The 1st Open House was held on October 26th, 2022.	N/A
	2nd Open House Date: March 9th, 2023 Method: Online and Email	The Notice of 2nd Open House was published on the Town of Essex's Website on March 9th, 2023. The Notice of Open House was sent to Adrian Chrisjohn and Cherilyn Hill on March 9th, 2023, via Email. The 2nd Open House was held on March 22nd, 2023.	N/A
	Notice of Draft ESR Date: May 30th, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was sent to individual Indigenous communities to solicit comments and inputs on May 30th, 2023.	N/A

Deshkan Ziibiing
Chippewas of the Thames
First Nation Treaties, Lands
and Environment

320 Chippewa Road
Muncey, ON, N0L 1Y0
Tel: 519-289-5555
Fax: 519-289-2230
info@cottfn.com

Project Name:
Colchester South Sewage Works Expansion Class EA

FN Consultation ID:
165620266

Consulting Org Contact:
Jian Li
Hannah Rindlisbacher

Consulting Organization:
Stantec

Date Received:
Tuesday, August 23, 2022

September 6, 2022

Dear: Jian

We have received information concerning the Colchester South Sewage Works Expansion Class EA, submitted August 23, 2022. The proposed project is located within the McKee Treaty area to which Chippewas of the Thames First Nation (COTTFN) is a signatory. It is also located within the Big Bear Creek Additions to Reserve (ATR) land selection area, as well as COTTFN Traditional Territory.

Based on the information that has been provided at this time, we have identified minimal concerns with your proposed project. We ask that as more information becomes available that you provide COTTFN the opportunity to review and provide comments. If there is an Archaeology Assessment conducted, we require notification and the opportunity to actively participate by sending First Nation Field Liaisons on behalf of this First Nation.

We look forward to continuing this open line of communication. To implement meaningful consultation, COTTFN has developed its own protocol - a document and a process that will guide positive working relationships. As per Appendix ‘D’ of the Wiindmaagewin please find attached Invoice 0385.

If you have any questions, please feel free to contact me.

Sincerely,

Original Signed
Fallon Burch
Consultation Coordinator
Chippewa of the Thames First Nation
(519) 289-5555 Ext 251

From: CFN Consultation Coordinator
To: Rindlisbacher, Hannah
Subject: consultwithcaldwell.ca - Project Submission
Date: Monday, August 15, 2022 4:03:43 PM

Michelle McCormack
Consultation Coordinator

Zack Hamm
Consultation Coordinator

Caldwell First Nation
14 Orange Street
Leamington | ON | N8H 1P5

We have received your inital submission

Please note that before the project is ready for review, **you must provide some additional information**:

The remaining information involves questions that were marked as "unsure"

- Habitat or flight paths
- Archaeological assessment
- Archaeological info

When you have this information ready, you can return to this website and submit your information.

If you have questions, please contact CFN's Consultation Coordinator: ecc@caldwellfirstnation.ca or 519-322-1766 ext. #1243.

*Please note that simply sending an email to the Consultation Coordinator or to a Chief and Council member does not constitute consultation.

*Please be advised that an administrative fee will be charged for a meeting with Chief and Council.

From: Rindlisbacher, Hannah
To: Zack Hamm
Cc: Michelle McCormack; Michael McMaster; Li, Jian; McBeth, David
Subject: RE: FW: 165620266 Colchester South Sewage Works Expansion Class Environmental Assessment
Date: Friday, June 23, 2023 9:08:00 AM
Attachments: Technical Review Agreement July 15 final.pdf

Good morning Zack,

Please see the attached Technical Review Agreement signed by the Town of Essex.

Thanks,

Hannah Rindlisbacher E.I.T., LEED Green Associate
Environmental Engineer in Training

Direct: 226-704-3060
Direct: 519-966-2250 ext
hannah.rindlisbacher@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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Please consider the environment before printing this email.

From: Zack Hamm <ecd.manager@caldwellfirstnation.ca>
Sent: Monday, June 19, 2023 11:45 AM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Cc: Michelle McCormack <ecc@caldwellfirstnation.ca>; Michael McMaster <ecd.assistant@caldwellfirstnation.ca>
Subject: Re: FW: 165620266 Colchester South Sewage Works Expansion Class Environmental Assessment

Good morning Hannah,

I appreciate your using the CCT according to our protocols of Consultation. Michelle has forwarded your correspondence to me; I will facilitate agreements between the Town of Essex and CFN regarding technical review and any fieldwork going forward.

For reference, our Department's scope of work for this will be thus: reviewing all materials associated with the project and providing comments if necessary (including arch and EA), judging the necessity of informing leadership and the community, judging the necessity of community engagement and internal meetings, and communicating with your and/or the Town of Essex regarding CFN's position, interests, and consent regarding the proposed project.

For further reference, an average Stage 2 or 3 AA takes 3-5 hours to review; an average EA takes 5-10 hours for our review. This means that our soft upset limit for this project will be 15 hours assuming there is no work aside from technical review.

Escalating EAs and sewage plans to leadership is rare, but if we judge it necessary, you might expect requests for a meeting with a CFN Councilor regarding your study's content. I've attached our fee schedule in the event of escalation toward community engagement and/or leadership involvement.

Best,

Zack Hamm
Environment and Consultation Department Manager
Environment and Consultation Department (ECD)



Caldwell First Nation
14 Orange Street
Leamington | ON | N8H 1P5
Phone: 226-936-2940
ecd.manager@caldwellfirstnation.ca

From: Rindlisbacher, Hannah
To: ecc@caldwellfirstnation.ca
Subject: FW: 165620266 Colchester South Sewage Works Expansion Class Environmental Assessment
Date: Tuesday, May 30, 2023 1:59:00 PM

Hello,

This is a notification of the draft Environmental Study Report. I was unable to upload it under the project on consultwithcaldwell.ca due to the size of it.

Please see the notice below with details to download the report.

Thank you for your time.

The Town of Essex initiated a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the expansion of the existing Colchester South Sewage Works to accommodate ongoing and future development within the community. This study will satisfy Phases 1, 2, 3 and 4 of the Class EA process which will involve the evaluation of alternative solutions and design concepts, and selection of the preferred design for the proposed Colchester South Sewage Works Expansion. This "Draft" Environmental Study Report was prepared to document the activities and recommendations from the Class EA process.

The Town is looking for comments and feedback on the "Draft" Environmental Study Report from review agencies and Indigenous communities. In an effort to conserve paper and reduce printing costs, the report is being distributed in electronic format.

Please visit the following link and login information to access the report:

Login Information

FTP link: https://tmpsftp.stantec.com
Login name: s0606110854
Password: 8974393
Disk Quota: 20 GB
Expiry Date: 6/13/2023

Additional project details are available on the Town's project webpage: Colchester South Sewage Works Expansion - Town of Essex

If you have any comments or concerns regarding this "Draft" Environmental Study Report, please contact the undersigned. We would appreciate receiving any comments on the draft report by June 16th, 2023.

Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T., LEED Green Associate
Process Engineer in Training

Direct: 226-704-3060
Direct: 519-966-2250 ext
hannah.rindlisbacher@stantec.com

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Windsor ON N8X 1L9

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From: Rindlisbacher, Hannah
Sent: Wednesday, May 17, 2023 1:15 PM
To: ecc@caldwellfirstnation.ca
Cc: McBeth, David <dmcbeth@essex.ca>
Subject: 165620266 Colchester South Sewage Works Expansion Class Environmental Assessment

Hello,

My name is Hannah Rindlisbacher, I work for Stantec Consulting Ltd. We are currently working with the Town of Essex to complete a Schedule 'C' Class Environmental Assessment to develop a long-term solution to accommodate increasing wastewater servicing demands due to significant development pressures within the Colchester South community, in the Town of Essex, Ontario. This study will involve the identification and description of the problem, and the evaluation of alternative solutions and design concepts for the expansion of the existing Colchester South Sewage Works.

I initially submitted this project for review through your consultation tool on August 15th, 2022. We have recently completed a draft 'Stage 1 Archaeological Assessment' report which I've included in the project submission and attached to this email. We would greatly appreciate your feedback on the report prior to submission to the Ministry of Citizenship and Multiculturalism. The Town of Essex is willing to pay your consultation fees. By the end of this month, we will also submit the draft Environmental Study Report for your review.

Thank you,

Hannah Rindlisbacher B.A.Sc., E.I.T., LEED Green Associate
Process Engineer in Training

Direct: 519 966-2250 ext 258
Mobile: 226 268-3033
hannah.rindlisbacher@stantec.com

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100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From: Rindlisbacher, Hannah
To: Courtney Jackson
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report
Date: Tuesday, June 27, 2023 3:33:00 PM

Hi Courtney,

I apologize for the inconvenience you experienced due to the expired link. The use of the temporary file sharing site was used as opposed to a public website as the report was only to be shared with review agencies and Indigenous communities at this time.

Please let me know when you expect to provide the Environment Committee's comments as this report will be presented at the Town's Council meeting on July 17th.

Thanks,
Hannah

From: Courtney Jackson <cjackson@aamjiwnaang.ca>
Sent: Tuesday, June 27, 2023 10:39 AM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Hi Hannah,

Unfortunately, the information is going to our Environment Committee on July 6th. The link was not active when it was originally planned for the committee and then I had to review the 500 plus page document once I received the USB and then pull useful information from the document to provide to the committee. Our committee only has two scheduled meetings per month. In the future, I feel that having the information available on a website could be more effective when you have deadlines to get comments.

Sincerely,
Courtney Jackson

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: Tuesday, June 27, 2023 10:24 AM
To: Courtney Jackson <cjackson@aamjiwnaang.ca>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Hi Courtney,

Just wondering if you would be able to send your review comments on the draft ESR soon? We were hoping to finalize the report this Friday, June 30th.

Thanks,

Hannah Rindlisbacher E.I.T., LEED Green Associate
Environmental Engineer in Training

Direct: 226-704-3060
Direct: 519-966-2250 ext
hannah.rindlisbacher@stantec.com

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100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From: Courtney Jackson <cjackson@aamjiwnaang.ca>
Sent: Wednesday, June 7, 2023 4:28 PM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Hi Hannah,
This email is to confirm I received the USB and had no issues opening the file.

Thank you,
Courtney

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: Monday, June 5, 2023 3:42 PM
To: Courtney Jackson <cjackson@aamjiwnaang.ca>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Hi Courtney,

Just to let you know, we mailed the USB to you on Thursday June 1st.

Please let me know when you receive it.

Thanks,
Hannah

From: Courtney Jackson <cjackson@aamjiwnaang.ca>
Sent: Thursday, June 1, 2023 9:13 AM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Thank you Hannah, and yes please send it to the address below.

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: Thursday, June 1, 2023 9:11 AM
To: Courtney Jackson <cjackson@aamjiwnaang.ca>
Cc: Caradonna, Sandra <Sandra.Caradonna@stantec.com>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Good morning Courtney,

That is no problem, we can mail it to you. Would you like it mailed to this address? 978 Tashmoo Ave. Sarnia, ON N7T 7H5

Thanks,
Hannah

From: Courtney Jackson <cjackson@aamjiwnaang.ca>
Sent: Thursday, June 1, 2023 9:04 AM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Good morning Hannah,
I would prefer it on a usb for large files. I was able to open the document but unable to save it to my computer. There is also an expiry date, we might run into issues accessing it when I take it to the meeting.

Thank you,
Courtney

From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: Wednesday, May 31, 2023 10:29 AM
To: Courtney Jackson <cjackson@aamjiwnaang.ca>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Hi Courtney,

Thank you for your quick response!

Were you able to download the report using the link and login information below? Did you need the report on a USB specifically for the meeting? I just worry about the arrival time for the USB if we mail it, which may delay the process further.

Let me know what you require.

Thanks,

Hannah Rindlisbacher B.A.Sc., E.I.T., LEED Green Associate
Process Engineer in Training

Direct: 226-704-3060
Direct: 519-966-2250 ext
hannah.rindlisbacher@stantec.com

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From: Courtney Jackson <cjackson@aamjiwnaang.ca>
Sent: Tuesday, May 30, 2023 2:25 PM
To: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Subject: RE: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Hi Hanna,

Thank you for your email and login information for the report. Can you please send the file on a USB? In the meantime, I will provide a brief summary to Aamjiwnaang's Environment Committee on Tuesday, June 6, 2023 and then their comments will be provided to Chief and Council. Unfortunately, there may be a delay in our response as our committee and Chief and Council only meets twice per month. I anticipate round June 22, 2023 for comments. There could also be the chance that the Environment Committee is ok with the report and then I can issue our response sooner.

Thank you,
Courtney Jackson

Courtney Jackson
Consultation Worker
Aamjiwnaang First Nation
978 Tashmoo Ave.
Sarnia, ON
N7T 7H5
Tel: (519) 336-8410 ext. 250
Fax: (519) 336-0382
https://www.facebook.com/AamjiwnaangEnvironment
www.aamjiwnaang.ca

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From: Rindlisbacher, Hannah <Hannah.Rindlisbacher@stantec.com>
Sent: Tuesday, May 30, 2023 1:49 PM
To: Courtney Jackson <cjackson@aamjiwnaang.ca>
Subject: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report

Dear Courtney,

The Town of Essex initiated a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the expansion of the existing Colchester South Sewage Works to accommodate ongoing and future development within the community. This study will satisfy Phases 1, 2, 3 and 4 of the Class EA process which will involve the evaluation of alternative solutions and design concepts, and selection of the preferred design for the proposed Colchester South Sewage Works Expansion. This "Draft" Environmental Study Report was prepared to document the activities and recommendations from the Class EA process.

The Town is looking for comments and feedback on the "Draft" Environmental Study Report from review agencies and Indigenous communities. In an effort to conserve paper and reduce printing costs, the report is being distributed in electronic format.

Please visit the following link and login information to access the report:

Login Information
FTP link: https://tmpsftp.stantec.com
Login name: s0606110854
Password: 8974393
Disk Quota: 20 GB
Expiry Date: 6/13/2023

Additional project details are available on the Town's project webpage: Colchester South Sewage Works Expansion - Town of Essex
If you have any comments or concerns regarding this "Draft" Environmental Study Report, please contact the undersigned. We would appreciate receiving any comments on the draft report by June 16th, 2023.

Sincerely,

Hannah Rindlisbacher B.A.Sc., E.I.T., LEED Green Associate
Process Engineer in Training

Direct: 226-704-3060
Direct: 519-966-2250 ext
hannah.rindlisbacher@stantec.com

Stantec

Stantec

To:	Courtney Jackson 978 Tashmoo Avenue Sarnia, ON N7T 7H5	From:	Hannah Rindlisbacher 100-2555 Ouellette Avenue Windsor ON N8X 1L9
File:	Colchester South Sewage Works Expansion Draft ESR	Date:	June 1, 2023

Reference: Colchester South Sewage Works Class EA

As requested, please see USB drive enclosed. The USB is encrypted and includes a copy of the Colchester South Sewage Works Expansion Draft Environmental Study Report, for your review.

Password: colchestersouth (all lowercase)

Stantec Consulting Ltd.

Hannah Rindlisbacher B.A.Sc., E.I.T., LEED Green Associate
Process Engineer in Training

Phone: 226-704-3060
hannah.rindlisbacher@stantec.com

From: Courtney Jackson
To: Rindlisbacher, Hannah
Cc: Lynn Rosales
Subject: 165620266 Colchester South Sewage Works Expansion - Notice of Draft Environmental Study Report
Date: Wednesday, July 26, 2023 11:47:07 AM

Hi Hannah,
The information was provided to Aamjiwnaang's Environment Committee and unfortunately, the report was too large for me to provide them and they have recommended a presentation in order to provide meaningful participation. I've included my colleague (Lynn Rosales – Environment Worker) to this email and she will be able to provide you with upcoming committee dates/times. You will have the option to present in-person or virtually. She will be able to go more into detail. What is the next steps after the Draft Environmental Study Report? If you have any questions, please let me know.

Thank you,
Courtney Jackson

Courtney Jackson
Consultation Worker
Aamjiwnaang First Nation
978 Tashmoo Ave.
Sarnia, ON
N7T 7H5
Tel: (519) 336-8410 ext. 250
Fax: (519) 336-0382
https://www.facebook.com/AamjiwnaangEnvironment
www.aamjiwnaang.ca

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Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

Caldwell First Nation

14 Orange Street, Leamington, Ontario, N8H 1P5
Phone: **519-322-1766** Fax: **519-322-1533**

To: Hannah Rindlisbacher E.I.T., LEED Green Associate, Environmental Engineer in Training

RE: 165620266 Colchester South Sewage Works Expansion Class Environmental Assessment, Environmental Study Report

Report Review and Comments

Reference	Text Example	Comments
Stantec Consulting Ltd. (2023). *Colchester South Sewage Works Expansion – Schedule 'C' Municipal Class Environmental Assessment: Environmental Study Report.* p63	"Based on the evaluation, Alternative No. 2 – Sequencing Batch Reactor was identified as the preferred treatment process because it is proven to generate good effluent quality within a moderate footprint at a moderate capital and O&M cost."	CFN agrees with the analysis that concluded SBR is the preferred alternative design for wastewater treatment technology. However, considering that SBR technology is energy intensive and the known impacts of energy consumption on the global climate, CFN requests that impactful mitigation measures are prioritized in the design phase. For example, significant savings in electricity consumption can be achieved by using renewable energy sources and utilising new WWTP technologies (Li et al., 2020).
Mamathoni, P., & Harding, K. G. (2021). Environmental performance of extended activated sludge and sequential batch reactor using life cycle assessment. *Cleaner Environmental Systems*, 2, 100039.	"Aeration in the three biological reactors was responsible for high electricity consumption in the secondary treatment phase of the SBR technology."	
Dutta, A., & Sarkar, S. (2015). Sequencing batch reactor for wastewater treatment:	"SBR-based treatment plants can easily address additional [effluent] requirements without addition of any new infrastructure, only by	It is stated both in the ESR and in additional sources (Mamathoni & Harding, 2021; Dutta & Sarkar, 2015) that an advantage to SBR technology is its adaptability and simpler expansion requirements to meet stricter effluent requirements set by the MECP in the future.

recent advances. *Current Pollution Reports*, 1, 177-190. Li, Y., Xu, Y., Fu, Z., Li, W., Zheng, L., & Li, M. (2021). Assessment of energy use and environmental impacts of wastewater treatment plants in the entire life cycle: A system meta-analysis. *Environmental Research*, 198, 110458.	optimizing the sequence of aerobic, anoxic, and anaerobic phases during the different stages of SBR process."	CFN requests that the design for the SBR be proactive, utilizing the best available optimization techniques.
Stantec Consulting Ltd. (2023). *Colchester South Sewage Works Expansion – Schedule 'C' Municipal Class Environmental Assessment: Environmental Study Report.* p71	"This [Aerobic digestion] process is simple to operate and maintain and is commonly applied at small wastewater treatment facilities. Although, this sludge stabilization process is energy intensive and comes at a moderate capital cost it is considered a beneficial addition to the wastewater treatment facility."	Similar to above, CFN requests that impactful measures are prioritized in the design phase to mitigate the environmental impacts of high energy consumption.
(ibid..p83)	"Use of erosion control measures (i.e. sediment traps, silt fences, etc.)"	It is important to consider that effective erosion and sediment control must move beyond the installation of devices such as silt fences and move towards an ongoing process within a project framework - from conception to construction. CFN requests that focus is placed on nature-based solutions and mitigation techniques for erosion control, for example: ● Vegetative filter strips; ● Mechanical seedings; ● Mulching; ● Growth media erosion control blanket.

(ibid. p84)	"Restore site by replacing topsoil and reinstate vegetation to prevent erosion."	CFN also requests that, where possible, original topsoil be stockpiled for reuse, seeding or sodding opposed to relying solely on replacement of the topsoil. Along with a focus on native species when restoring the site.
(ibid. p88)	"The potential environmental impacts and corresponding mitigation measures described in Section 9.1 will require monitoring during construction and operation of the proposed facility. The monitoring program is to track impacts to the natural, social, archaeological, and cultural heritage environments, as applicable."	CFN is interested in fielding staff to participate in aspects of the monitoring program and in training opportunities for CFN field staff/community members that would build capacity. This must include financial compensation via our standard agreements.
(ibid. p93)	"The sensitive nature of this feature will be considered because these areas are at a greater risk for contamination from land use activities. Proper mitigation measures will be taken to ensure that the proposed work does not result in increased risk of contamination of the aquifer."	Text is referencing that portions of the study area for this EA fall within a Highly Vulnerable Aquifer (HVA) / Significant Groundwater Recharge Area (SGRA). CFN requires a clear and detailed outline of what mitigation measures will be taken, and how they will be maintained.
(ibid. p95)	"In the last decade alone, this region has experienced six (6) significant storm events that have surpassed current 1:100-year regulatory standards and have resulted in urban flooding issues and sewer backups that have impacted hundreds of homes and businesses in the region." p 95	The report acknowledges that increased rainfall in the region, as a result of the climate crisis, will have a significant impact on municipal sewer systems, and that solutions which increase system resilience are necessary, it is not enough. CFN requests that a discrete section be included in the report about climate change mitigation and adaptation measures for the

		development. For example, the ways development will mitigate high energy use of SBR & aerobic digestion technology. Additionally, CFN requests updates and access to said reporting.
(ibid. p471, 472)	"Based on preliminary assessment, impacts to SAR and/or SAR habitat may occur due to the Project. As such, targeted surveys to determine the presence/absence of SAR are recommended for the Study Area" Appendix E: Natural Heritage Impact Assessment report; Section 6.4 Recommended Surveys	Any impacts to the 19 Species at Risk (SAR), 13 Species of Conservation Concern (SOCC) or their habitats, should be avoided. Additionally, local First Nations have culturally specific Species of Interest that the Proponent should take special care toward. CFN requests the completion of all the MECP recommended target surveys for birds, insects, plants and fish; and to be provided with any supplementary species-specific protection/ monitoring reports.

The Study Area has 13 SOCC and 19 SAR identified as potentially present, and contains suitable wildlife habitat for 10 SAR. Additionally, the Study Area contains provincially rare lowland floodplain forest dominated by black walnut (FODM7-4), is immediately adjacent to the Lypps Beach Provincially Significant Wetland (PSW) and portions also fall within an HVA/SGRA. Considering this environmental significance, CFN requires consultation for all potential aspects of the project that could impact ecosystems, emphasizes the avoidance of all significant habitat, and requests that thorough and enforceable mitigation measures be outlined going forward.

One of the main evaluation criteria for the preference of alternative design solution, i.e. Upgrade Colchester South Sewage Works and Expand Existing Service Area, was the current development pressure from Colchester Bay Development, in addition to six other potential future developments that would increase the service area. These potential projects are on CFN's Traditional Territory, therefore CFN, as a rightsholding community, expects to be notified and initiate a consent-based consultation process in accordance with the *United Nations Declaration on the Rights of Indigenous Peoples,* and UNDRIPA, specifically with reference to the right to free, prior and informed consent (FPIC).

Respectfully,



Zack Hamm
Department Manager, Environmental & Consultation
Caldwell First Nation
226-936-2940
ecd.manager@caldwellfirstnation.ca

Stantec Consulting Ltd.
100-140 Ouellette Place, Windsor ON N8X 1L9

September 14, 2023
File: 165620266

Attention: Mr. Zack Hamm, Department Manager, Environmental & Consultation

Caldwell First Nation
14 Orange Street
Leamington ON, N8H 1P5

Dear Mr. Hamm,

Reference: 165620266 Colchester South Sewage Works Expansion Class Environmental Assessment, Environmental Study Report

Thank you for your comments on the Draft ESR for the Colchester South Works Expansion, Town of Essex. The following is in response to your comments on the draft ESR, which was received on August 11, 2023.

Response to Review Comments

No.	Caldwell Comments	Stantec Response
1	CFN agrees with the analysis that concluded SBR is the preferred alternative design for wastewater treatment technology. However, considering that SBR technology is energy intensive and the known impacts of energy consumption on the global climate, CFN requests that impactful mitigation measures are prioritized in the design phase. For example, significant savings in electricity consumption can be achieved by using renewable energy sources and utilising new WWTP technologies (Li et al., 2020). It is stated both in the ESR and in additional sources (Mamathoni & Harding, 2021; Dutta & Sarkar, 2015) that an advantage to SBR technology is its adaptability and simpler expansion requirements to meet stricter effluent requirements set by the MECP in the future.	At this stage of the project (high-level planning), it is not possible to determine the exact mitigation measures and/or monitoring programs that will be required as a part of these works. During detailed design, many features of the proposed expansion including the size, layout, and technical specifications of the wastewater treatment processes will be refined. At such a time, a more detailed assessment of potential impacts and required mitigation measures can be carried out in collaboration with ERCA, the MECP, and other interested parties. During the detailed design phase, mitigation measures to reduce the impact of energy consumption on the global climate will be considered. We will investigate the utilization of renewable energy sources and other methods to optimize energy efficiency of the SBR technology.

	CFN requests that the design for the SBR be proactive, utilizing the best available optimization techniques.	
2	Similar to above, CFN requests that impactful measures are prioritized in the design phase to mitigate the environmental impacts of high energy consumption.	Please refer to Response No.1 regarding mitigation measures.
3	It is important to consider that effective erosion and sediment control must move beyond the installation of devices such as silt fences and move towards an ongoing process within a project framework - from conception to construction. CFN requests that focus is placed on nature-based solutions and mitigation techniques for erosion control, for example: ● Vegetative filter strips; ● Mechanical seedings; ● Mulching; ● Growth media erosion control blanket. CFN also requests that, where possible, original topsoil be stockpiled for reuse, seeding or sodding opposed to relying solely on replacement of the topsoil. Along with a focus on native species when restoring the site.	Effective erosion and sediment control methods will be implemented throughout the construction process. During the detailed design phase, mitigation measures will be further reviewed and specified to the work. We will make note in the ESR to consider implementation of nature-based solutions and mitigation techniques for erosion control. Please also refer to Response No.1 regarding mitigation measures. Standard practice is to reuse original topsoil when restoring the site. Upon completion of construction, the site will be restored to its preconstruction conditions where possible which involves rehabilitating temporary disturbance areas with a native seed mix, reinstating vegetation, and reusing original topsoil. During construction, the management of any excess soils will be carried out in accordance with O.Reg. 406/19 On-Site and Excess Soil Management.
4	CFN is interested in fielding staff to participate in aspects of the monitoring program and in training opportunities for CFN field staff/community members that would build capacity. This must include financial compensation via our standard agreements.	The specific requirements of the monitoring program will be developed during the detailed design stage in order to provide instructions suitable to the exact location of the facility and synchronize the program with construction schedule and scope of work. It will be noted in the ESR that CFN

		is interested in fielding staff to participate in the monitoring program.
5	Text is referencing that portions of the study area for this EA fall within a Highly Vulnerable Aquifer (HVA) / Significant Groundwater Recharge Area (SGRA). CFN requires a clear and detailed outline of what mitigation measures will be taken, and how they will be maintained.	Although portions of the service area fall within a Highly Vulnerable Aquifer (HVA) and a Significant Ground Water Recharge Area (SGRA), there are no associated Significant Drinking Water Threats (SDWTs) or policies within this area because the municipal water treatment plant does not use groundwater as its supply. Please refer to Response No.1 regarding mitigation measures.
6	The report acknowledges that increased rainfall in the region, as a result of the climate crisis, will have a significant impact on municipal sewer systems, and that solutions which increase system resilience are necessary, it is not enough. CFN requests that a discrete section be included in the report about climate change mitigation and adaptation measures for the development. For example, the ways development will mitigate high energy use of SBR & aerobic digestion technology. Additionally, CFN requests updates and access to said reporting.	Please refer to the last paragraph of **Section 9.3.11 Climate Change**, which describes the primary technical considerations to be evaluated during the detailed design phase in order to reduce any impact to climate change. Please refer to Response No.1 regarding mitigation measures.
7	Any impacts to the 19 Species at Risk (SAR), 13 Species of Conservation Concern (SOCC) or their habitats, should be avoided. Additionally, local First Nations have culturally specific Species of Interest that the Proponent should take special care toward.	The recommended field surveys to determine if SAR and SOCC are present in the study area will be completed, as per the 'Section 7 Next Steps' of the *Natural Heritage Impact Assessment Report* in Appendix E of the ESR. During the detailed design and staging, consultation with the MECP will determine mitigation measures and authorization

Reference: **165620266 Colchester South Sewage Works Expansion Class Environmental Assessment, Environmental Study Report**

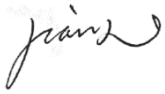
	CFN requests the completion of all the MECP recommended target surveys for birds, insects, plants and fish; and to be provided with any supplementary species-specific protection/ monitoring reports.	requirements for provincially regulated SAR.
8	The Study Area has 13 SOCC and 19 SAR identified as potentially present, and contains suitable wildlife habitat for 10 SAR. Additionally, the Study Area contains provincially rare lowland floodplain forest dominated by black walnut (FODM7-4), is immediately adjacent to the Lypps Beach Provincially Significant Wetland (PSW) and portions also fall within an HVA/SGRA. Considering this environmental significance, CFN requires consultation for all potential aspects of the project that could impact ecosystems, emphasizes the avoidance of all significant habitat, and requests that thorough and enforceable mitigation measures be outlined going forward.	Please refer to Response No.1 regarding mitigation measures. We will continue to engage with all Indigenous communities that have been engaged with to date, as the Class EA process proceeds. We will make note in the ESR that CFN requires consultation for all potential aspects of the project that could impact ecosystems.
10	One of the main evaluation criteria for the preference of alternative design solution, i.e. Upgrade Colchester South Sewage Works and Expand Existing Service Area, was the current development pressure from Colchester Bay Development, in addition to six other potential future developments that would increase the service area. These potential projects are on CFN's Traditional Territory, therefore CFN, as a rightsholding community, expects to be notified and initiate a consent-based consultation process in accordance with the *United Nations Declaration on the Rights of Indigenous Peoples*, and UNDRIPA, specifically with reference to the right to free, prior and informed consent (FPIC).	Please be advised that the planning and approval of these developments is subject to acceptance and consent by the County and the Town of Essex. Although the current development pressure from future developments has an impact on the outcomes of this study, the purpose of this Environmental Assessment is to determine a long-term solution to accommodate the increasing wastewater servicing demands in the community of Colchester South. The proposed future developments mentioned in the ESR are subject to a separate review and approval process.

Reference: **165620266 Colchester South Sewage Works Expansion Class Environmental Assessment, Environmental Study Report**

Stantec Consulting Ltd.



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c. Mr. David McBeth, Manager Capital Works & Asset Management, Town of Essex

Caldwell First Nation

14 Orange Street, Leamington, Ontario, N8H 1P5
Phone: **519-322-1766** Fax: **519-322-1533**

To: Hannah Rindlisbacher, Process Engineer in Training, Stantec

RE: Stage 1 Archaeological Assessment: South Colchester Sewage Works Expansion

Report Review and Comments

Reference	Text Example	Comments
Stage 1 Archaeological Assessment: South Colchester Sewage Works Expansion. p,2	…insufficient to completely confirm that no burial activity…	Given the high likelihood that there are burials outside of the legal boundaries of the cemetery, is there any discussions of using GPR to establish a rough idea of where the burials stop, or will that be done through test pitting? Given the depths of some burials, would test pitting be sufficient? On behalf of CFN, our Department is interested in GPR applications to these processes, and we would like to discuss how Stantec might incorporate them as a means of exceeding, rather than meeting, provincial standards.
Ibid p. 11	Caldwell First Nation were not part of the negotiations or signing of Treaty Number 2…	We appreciate this distinction; it is often left out of histories of Treaty 2.
Ibid p.13	identifies lots 68, 69, and 70 as “reserved burying place”, and an “Indigenous encampment” is illustrated along the boundary of lots 55 and 56 (Figure 7).	Given this information, it seems likely that there is high potential for Indigenous burials in the area that were not known to the European colonizers. As also mentioned in the report, this land

		has been largely undisturbed, so the chance of intact graves seems much higher. With this in mind, what proactive steps are being taken to ensure that if graves are uncovered that nothing untoward happens to them if the Proponent was to decide not to continue the excavation? We do not want a repeat of the situation that has happened at other sites where remains have been left with inadequate protection, sometimes for years, because the Proponent didn't want the headache of dealing with them.
Ibid. p19	…visited and documented the two registered earthwork locations and the Indigenous scatter noted above…	Not to belabor the point, but there are two burial mounds and an associated scatter within a 30-45 minute walk of the site. Given the recorded existence of an Indigenous burial ground and habitation site in the area, along with a water source directly at hand the potential seems incredibly high.
Ibid. p. 20	…however in recent years this area has been replanted as part of naturalization efforts and now…	Is there any indication that during this replanting any artefacts were found? Is it possible to discover who did this work?
Ibid p. 25	These deep-testing methodologies should be employed within a minimum area of 10 metres from the modern cemetery boundary, as allowed by the study area.	Is there a possibility of doing some sort of non-destructive survey first? A GPR survey or similar? It's not unheard of for Europeans to utilize existing burial areas of other cultures they colonize

This is well done and comprehensive. We're satisfied that due diligence had been done within the Ministry guidelines. Given the potential of the site we are very interested in any subsequent excavation. We understand the guidelines are often a blunt instrument that eschews subtlety; we're glad you made it clear that the lack of nearby registered sites is due to the lack of development and investigation and weighed it in your assessment.

Respectfully,



Zack Hamm
Department Manager, Environmental & Consultation
Caldwell First Nation
226-936-2940
ecd.manager@caldwellfirstnation.ca

Stantec Consulting Ltd.
100-140 Ouellette Place, Windsor ON N8X 1L9

September 14, 2023
File: 165620266

Attention: Mr. Zack Hamm, Department Manager, Environmental & Consultation

Caldwell First Nation
14 Orange Street
Leamington ON, N8H 1P5

Dear Mr. Hamm,

Reference: 165620266 Colchester South Sewage Works Expansion Class Environmental Assessment, Stage 1 Archaeological Assessment

Thank you for your comments on the Stage 1 Archaeological Assessment (Stage 1 AA) for the Colchester South Works Expansion, Town of Essex. The following is in response to your comments on the Stage 1 AA, which was received on August 11, 2023.

Response to Review Comments

No.	Caldwell Comments	Stantec Response
1	Given the high likelihood that there are burials outside of the legal boundaries of the cemetery, is there any discussions of using GPR to establish a rough idea of where the burials stop, or will that be done through test pitting? Given the depths of some burials, would test pitting be sufficient? On behalf of CFN, our Department is interested in GPR applications to these processes, and we would like to discuss how Stantec might incorporate them as a means of exceeding, rather than meeting, provincial standards.	Test pitting is usually not sufficient to determine burial activity outside known cemetery limits. Ultimately, if the Stage 1 background research determines there is potential for human remains, a Stage 3 cemetery investigation will be necessary under a **Cemetery Investigation Authorization**. Please see The *Registrar's Directive: Authorizations for Stages 2-4 Archaeological Fieldwork* for further info. Regarding the use of GPR, the Ministry of Citizenship and Multiculturalism (MCM) and the Bereavement Authority of Ontario (BAO) do not acknowledge GPR findings as conclusive evidence, particularly when verifying the absence or presence of human remains. While GPR can offer valuable insights to direct cemetery investigations, they are considered supplementary and not a replacement for a full Stage 3 cemetery investigation.

2	We appreciate this distinction; it is often left out of histories of Treaty 2.	Acknowledged.
3	Given this information, it seems likely that there is high potential for Indigenous burials in the area that were not known to the European colonizers. As also mentioned in the report, this land has been largely undisturbed, so the chance of intact graves seems much higher. With this in mind, what proactive steps are being taken to ensure that if graves are uncovered that nothing untoward happens to them if the Proponent was to decide not to continue the excavation? We do not want a repeat of the situation that has happened at other sites where remains have been left with inadequate protection, sometimes for years, because the Proponent didn't want the headache of dealing with them.	If a client decides not to continue a project or excavation after human remains are exposed, the area should be restored, and Ministry of Public and Business Service Delivery (MPBSD) Registrar, *Funeral, Burial and Cremation Services Act* (FBCSA) will declare the burial site to be either an: Indigenous people burial ground, burial ground, or an irregular burial site. The MPBSD Registrar, FBCSA will provide guidance on the next steps to be taken.
4	Not to belabor the point, but there are two burial mounds and an associated scatter within a 30-45 minute walk of the site. Given the recorded existence of an Indigenous burial ground and habitation site in the area, along with a water source directly at hand the potential seems incredibly high.	Acknowledged.
5	Is there any indication that during this replanting any artefacts were found? Is it possible to discover who did this work?	Will inquire with the Town of Essex.
6	Is there a possibility of doing some sort of non-destructive survey first? A GPR survey or similar? It's not unheard of for Europeans to utilize existing burial areas of other cultures they colonize	Please refer to Response No.1.

Reference: **165620266 Colchester South Sewage Works Expansion Class Environmental Assessment, Stage 1 Archaeological Assessment**

Stantec Consulting Ltd.

Darren Kipping MA, RPA
Project Archaeologist
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APPENDIX E: FIELD INVESTIGATIONS

1. Natural Heritage Impact Assessment Report
2. Stage 1 Archaeological Assessment Report
3. Heritage Overview Memo

APPENDIX E

Natural Heritage Impact Assessment Report

Colchester South Sewage Works Expansion – Class EA: Natural Heritage Assessment

FINAL REPORT

June 29, 2023

Prepared for:
Town of Essex

Prepared by:
Stantec Consulting Ltd.
600-171 Queens Avenue
London, ON N6A 5J7

Project Number:
165620266

Limitations and Sign-off

The conclusions in the Report titled Colchester South Sewage Works Expansion – Class EA: Natural Heritage Assessment are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Town of Essex (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.

Prepared by:	Ellah, Mitch 2023.06.29 13:32:38 -04'00'	Digitally signed by Brian Miller Date: 2023.06.29 22:38:08 -04'00'
	Signature	Signature
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	Printed Name	
Reviewed by:	Digitally signed by Taylor, Andrew (Guelph) Date: 2023.06.29 13:59:54 -04'00'	Digitally signed by Harttrup, Nancy Date: 2023.06.29 13:44:41 -04'00'
	Signature	Signature
	Andrew Taylor, B.Sc. Senior Ecologist, Associate	Nancy Harttrup, B.Sc. Senior Fisheries Biologist
	Printed Name	Printed Name

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Acronyms / Abbreviations

ANSI	Area of Natural and Scientific Interest
DFO	Fisheries and Oceans Canada
ESA	*Endangered Species Act,* 2007 (Ontario)
LIO	Land Information Ontario
MNRF	Ontario Ministry of Natural Resources and Forestry
NHIC	Natural Heritage Information Centre
OBBA	Ontario Breeding Bird Atlas
OBA	Ontario Butterfly Atlas
OMA	Ontario Moth Atlas
ORAA	Ontario Reptile and Amphibian Atlas
PSW	Provincially Significant Wetland
SAR	Species at Risk
SARA	Species at Risk Act
SARO	Species at Risk in Ontario
SOCC	Species of Conservation Concern

1 Introduction

Stantec Consulting Ltd. (Stantec) was retained by the Town of Essex, to carry out a Municipal Class Environmental Assessment (EA) for the Colchester South Sewage Works Expansion (the Project). The Project is classified as a Schedule C project under the Municipal Class EA process. Schedule C projects require the preparation and filing of an Environmental Study Report (ESR) for review by the public and relevant agencies.

The waterfront community of Colchester South is located in Southwestern Ontario, it is an unincorporated place near the southernmost point of Canada (Point Pelee National Park). It is located on the north shore of Lake Erie approximately 6.0 kilometers south of the town of Harrow. Colchester was formerly part of the Township of Colchester South, but it is now a part of the amalgamated Town of Essex (made up of Essex Centre, Harrow, Colchester, McGregor) within the County of Essex. The Canadian Census Program shows the population of Colchester as of 2021 was approximately 2,334 people. In addition to the year-round residents, Colchester is made up of lakeside cottages, wineries, restaurants, a marina, public beach, and a harbour.

The Colchester South Sewage Works is located on Farm Lot 82, Concession 1 along Cornwall Beach Road (**Figure 1, Appendix A**). The sanitary sewer system was constructed in the 1980s and was initially constructed to service existing development but designed to allow for future population growth. The existing sewage works consists of a gravity sanitary sewer system with six (6) lift pumping stations that pump wastewater to an aerated facultative lagoon system for treatment.

There is an increase in wastewater servicing demand due to new developments proposed in Colchester South. Options to expand the existing sanitary sewer system are being investigated through the Class EA. The location for the proposed expansion is the land situated directly west of the existing lagoon system. The location is within an Essex Region Conservation Authority (ERCA) regulated wetland buffer that underwent a restorative tree planting program.

As part of the EA, Stantec completed a natural heritage assessment for the proposed expansion of the Colchester South Sewage Works. The assessment was conducted for the proposed Site boundary plus adjacent lands within 120 m, collectively known as the Study Area (**Figure 1, Appendix A**), and included a desktop review of natural heritage background data and a field investigation. The assessment focused on documenting and describing natural heritage features, vegetation communities, wildlife habitat, rare species, Species at Risk (SAR) and their habitats, and fish habitat within the Study Area.

This report provides the results of the natural heritage assessment and includes a discussion of natural heritage constraints, general mitigation measures and anticipated natural heritage related permit needs for the Project.

2 Desktop Review

2.1 Background Information Sources

Background documents and information sources were consulted to obtain natural heritage designations for the Study Area. The following information sources were reviewed:

- Natural Heritage Information Centre (NHIC) (MNRF 2023a)
- Land Information Ontario (LIO) (MNRF 2023b)
- Ontario Ministry of Agriculture, Food and Rural Affairs Ag. Maps (OMAFRA) (OMAFRA 2023)
- Essex Region Natural Heritage System Study (ERNHSS) (Essex Region 2013)
- Essex Region Conservation Authority (ERCA) Public Interactive Mapping (ERCA 2022)
- Town of Essex Official Plan (Town of Essex 2009)

Online natural heritage databases, wildlife atlases and SAR mapping were reviewed to identify flora and fauna records for the Study Area. Records of SAR and Species of Conservation Concern (SOCC), occurrences of amphibians, reptiles, birds and mammals, Provincially Significant Wetlands (PSWs), Areas of Natural and Scientific Interest (ANSIs), and fish and fish habitat data were obtained from the following sources:

- Natural Heritage Information Centre (NHIC) (MNRF 2023a)
- Land Information Ontario (LIO) (MNRF 2023b)
- Species at Risk in Ontario (SARO) List (MECP 2023)
- Species List on Schedule 1 of the Species at Risk Act (SARA) (Government of Canada 2023)
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Map (DFO 2023)
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature 2019)
- Ontario Breeding Bird Atlas (OBBA) (Cadman et al. 2007)
- Ontario Butterfly Atlas (OBA) (Toronto Entomologists' Association (TEA) 2023a)
- Ontario Moth Atlas (OMA) (Toronto Entomologists' Association 2023b)
- eBird Online Database (eBird 2023)
- iNaturalist Online Observations (iNaturalist 2023)

Many of the above-listed resources do not provide the exact locations of a species occurrence, with accuracy ranging from 1-km² (e.g., NHIC) to 10-km² (wildlife atlases). As such they are used as an indicator of potential occurrence in the Study Area.

2.2 Results

2.2.1 Natural Heritage Landscape Context

The Study Area is located in the Town of Essex in Essex County in Ecoregion 7E in (Ecodistrict 7E-1). This is the most southerly ecoregion and district in Canada. The district is dominated by agriculture (~90%). Natural areas such as deciduous forested woodlots occupy a small portion of the land.

The Study Area is situated in a rural section of the Town at the far west end of Lake Erie on its north shore. The main natural area in the area is the Lypp's Beach Provincially Significant Wetland, which is located within and extending west of the Study Area. Agricultural lands are the predominant surrounding land use in addition to housing along the lake shore and other small communities.

Other significant natural areas located in the broader area are the extensive Big Creek Marsh PSW to the west and South Harrow Woods, Oxley Poison Sumac Swamp, and Cedar Creek PSWs to the east.

Ecodistrict 7E-1 is in Ontario's Carolinian floristic zone. The district has a high concentration of rare flora compared to other areas of Ontario including species not found elsewhere in Canada (Oldham 2017). Natural areas in this district have a greater potential to harbour rare plant species than other areas of Ontario.

2.2.2 Natural Heritage Designations and Features

Natural heritage designations are present within the Study Area (**Figure 1, Appendix A**).

The forested riverine corridor on the north end of the Site is part of the Lypp's Beach Provincially Significant Wetland (PSW) (ERCA 2022, MNRF 2023a). This corridor is also considered a Woodland (MNRF 2023a), an Environmental Significant Area (ERCA 2022), and a Significant Valleyland (ERCA 2022).

The land to the north of the current sewage lagoons and the riverine corridor are considered an Existing Natural Feature (Essex Region 2013, ERCA 2022) and the entire Site is considered a Restoration Opportunity (Essex Region 2013, ERCA 2022).

The ERCA has identified that portions of the Study Area fall within the ERCA Regulated Area, are within a Surface Water Intake Protection Zone and within a Highly Vulnerable Aquifer / Significant Groundwater Recharge Area (ERCA, personal communication, October 27, 2022).

Information about the mapped watercourse associated with the forested corridor is variable among the data sources. The mapped unnamed watercourse has a permanent flow regime and no assigned thermal regime (MNRF 2023b). ERCA identifies the watercourse as the Wilson D&W Drain (ERCA 2022). Other databases do not identify the feature as a drain within the Study Area and that the Wilson D&W Drain is located east of the Study Area (OMAFRA 2023; MNRF 2023b). East of the Study Area, the Wilson D&W Drain is a Class F drain (OMAFRA 2023). Class F Drains have an intermittent flow regime (DFO 2017). For the purposes of this report and for consistency with ERCA data, the mapped watercourse in the Study Area will be referred to as Wilson D&W Drain.

There are no fish community records for Wilson D&W Drain (MNRF 2023b). Downstream of the Study Area, the Wilson D&W drain is mapped as being piped under houses on Lake Crest Court (MNRF 2023b), which is likely a barrier to fish movement.

The Study Area is within the Colchester Area Drainage (Essex Region 2013).

2.2.3 Species of Conservation Concern

Species of Conservation Concern (SOCC) are those species that are provincially rare (S1-S3 ranked species), listed as special concern (SC) on the SARO list or are listed as threatened or endangered on Schedule 1 of the *Species at Risk Act, 2002.* Species that are protected by the *Endangered Species Act, 2007* (ESA) are not SOCC; they are considered SAR and discussed in the following section.

Status rankings (S-ranks) for wildlife are based on the number of occurrences in Ontario and have the following meanings (OMNR 2000):

- S1: extremely rare; usually 5 or fewer occurrences in the province
- S2: very rare; usually between 5 and 20 occurrences in the province
- S3: rare to uncommon; usually between 20 and 100 occurrences in the province
- S4: common; usually more than 100 occurrences in the province
- S#B: breeding status rank
- S#N: Non-breeding status rank

Thirteen (13) SOCC were identified in the background review as having potential to be present within or near the Study Area (Table 1). The potential for SOCC to be present in the Study Area is limited by the presence of suitable habitat in the Study Area.

Table 1: Species of Conservation Concern known to occur in or near the Study Area

Common Name	Scientific Name	Species Status SARO	Species Status SARA	Species Status S Rank	Source(s)
Birds					
Barn Swallow	*Hirundo rustica*	SC	THR	S4B	eBird[1]
Eastern Wood-Pewee	*Contopus virens*	SC	SC	S4B	eBird
Wood Thrush	*Hylocichla mustelina*	SC	THR	S4B	eBird
Fish					
Silver Lamprey (Great Lakes - Upper St. Lawrence populations)	*Ichthyomyzon unicuspis pop. 1*	SC	SC	S3	Aquatic SAR Maps[2]
Spotted Sucker	*Minytrema melanops*	SC	SC	S2	Aquatic SAR Maps

Table 1: Species of Conservation Concern known to occur in or near the Study Area

Common Name	Scientific Name	Species Status SARO	Species Status SARA	Species Status S Rank	Source(s)
Insects					
American Burying Beetle	*Nicrophorus americanus*	EXP	EXP	SH?	NHIC[3]
Monarch	*Danaus plexippus*	SC	SC	S4B, S2N	TEA[4]
Plants					
Common Hop-tree	*Ptelea trifoliata*	SC	SC	S3	NHIC
Swamp Rose-mallow	*Hibiscus moscheutos*	SC	SC	S3	NHIC
Reptiles					
Eastern Musk Turtle	*Sternotherus odoratus*	SC	SC	S3	Ontario Nature[5]
Midland Painted Turtle	*Chrysemys picta marginata*	NA	SC	S4	Ontario Nature
Northern Map Turtle	*Graptemys geographica*	SC	SC	S3	Ontario Nature
Snapping Turtle	*Chelydra serpentina*	SC	SC	S4	NHIC, Ontario Nature

1 eBird Canada 2023

2 DFO 2023

3 MNRF 2023a

4 TEA 2023a

5 Ontario Nature 2019

2.2.4 Species at Risk

Species at Risk are those species that are listed as endangered (END) or threatened (THR) under the provincial ESA.

The ESA was created to protect SAR and their habitats. Endangered, threatened, and extirpated species listed on the SARO automatically receive legal protection from harm or harassment. The habitat of a given species is classified as either general habitat protection or regulated habitat protection (i.e., defined under regulation).

Nineteen (19) SAR were identified in the background review as having potential to be present within or near the Study Area (Table 2). The potential for SAR to be present in the Study Area is limited by the presence of suitable habitat in the Study Area.

The record for Eastern Foxsnake was identified by the NHIC (NHIC, personal communication, February 15, 2023) to be a “high accuracy record” with the species observation having occurred in 2020. This record is assumed to be associated with the Lypp’s Beach PSW.

Suitable habitat for Eastern Foxsnake in Essex County within 1500 m of an Eastern Foxsnake observation is Regulated Habitat under the ESA (MECP 2022).

Table 2: Species at Risk known to occur near or in the Study Area

Common Name	Scientific Name	Species Status SARO	Species Status SARA	Species Status S Rank	Source(s)
Birds					
Bank Swallow	*Riparia riparia*	THR	THR	S4B	eBird[1]
Bobolink	*Dolichonyx oryzivorus*	THR	THR	S4B	eBird
Chimney Swift	*Chaetura pelagica*	THR	THR	S3B	eBird
Eastern Meadowlark	*Sturnella magna*	THR	THR	S4B	eBird
Prothonotary Warbler	*Protonotaria citrea*	END	END	S1B	NHIC[2]
Red-headed Woodpecker	*Melanerpes erythrocephalus*	END	THR	S3	eBird
Yellow-breasted Chat	*Icteria virens*	END	END	S1B	NHIC
Fish					
Silver Chub	*Macrhybopsis storeriana*	THR	END	S2	Aquatic SAR Maps[3]
Mammals					
Eastern Small-footed Myotis	*Myotis leibii*	END	NA	S2S3	SARO[4]
Little Brown Myotis	*Myotis lucifugus*	END	END	S3	SARO
Northern Myotis	*Myotis septentrionalis*	END	END	S3	SARO
Tri-Coloured Bat	*Perimyotis subflavus*	END	END	S3?	SARO
Mussels					
Eastern Pondmussel	*Ligumia nasuta*	END	SC	S1	NHIC
Plants					
Butternut	*Juglans cinerea*	END	END	S2	SARO
Reptiles					
Blanding's Turtle	*Emydoidea blandingi*	THR	THR	S3	NHIC
Eastern Massasauga (Carolinian)	*Sistrurus catenatus catenatus*	END	END	S1	Ontario Nature[5]
Eastern Foxsnake	*Pantherophis gloydi*	END	END	S3	Ontario Nature, NHIC
Five-lined Skink	*Eumeces fasciatus*	END	END	S2	Ontario Nature
Spotted Turtle	*Clemmys guttata*	END	END	S2	NHIC

1 eBird Canada 2023

2 MNRF 2023a

3 DFO 2023

4 MECP 2023

5 Ontario Nature 2019

3 Field Investigation

A field investigation was completed on March 2, 2023. Weather conditions were overcast, with an air temperature of 4 to 5°C and light winds. The field investigation was completed where land access was permitted and included the area within the Site boundary and portions of the Study Area. Private lands in the Study Area were assessed from the limit of accessible lands.

3.1 Methods

3.1.1 Ecological Land Classification

Ecological Land Classification (ELC) surveys were completed to identify and map natural and anthropogenic vegetation communities in the Study Area. Surveys were completed outside of the growing season, so a complete assessment of vegetation communities was not possible. However, it was possible to document the dominant vegetation forms and species in most cases.

Identification and mapping of vegetation communities follows the protocols of the ELC field guide for Southern Ontario (Lee et al., 1998). Updates to vegetation community names and codes follow the 2008 catalogue of ELC vegetation communities. ELC mapping was completed to the finest level of resolution (Vegetation Type) where possible. Vegetation communities were first identified on aerial imagery and then checked in the field. Provincial significance of vegetation communities was based on the rankings assigned by the Natural Heritage Information Centre (MNRF 2023a).

To the extent possible given the winter conditions and in the absence of snow cover, SAR and SOCC plants such as the endangered butternut tree were surveyed for and mapped if encountered.

3.1.2 Migratory Bird Nest Survey

Migratory birds and their nests are protected under the *Migratory Bird Convention Act, 1994* (MBCA), and are afforded protection on all lands. Observed bird nests were documented during the site visit.

3.1.3 Bat Maternity Roost Tree Survey

Trees in the Study Area were assessed for potential suitability as bat maternity roosts. The assessment followed the recommended methods in the MNRF Guelph District *Bat and Bat Habitat Surveys of Treed Habitats* (MNRF 2017) which was based in part on the *Bat and Bat Habitat Guidelines* (MNRF 2011). According to the MNRF Guelph District protocol, the best candidate trees for maternity colonies are likely to contain several characteristics (to be considered a potential treed roost habitat, not all habitat characteristics listed below needed to be present), which include:

- Height – where trees are tallest in the stand
- Diameter – where trees have a large diameter at breast height (DBH)
- Loose/peeling bark – where trees have a large amount of peeling/loose bark

- Cavity height – where cavity height is high on the tree (>10 m high)
- Open canopy – located in an area of open canopy for accessibility in and out of tree
- Decay – where the tree exhibits early stages of decay

3.1.4 Significant Wildlife Habitat Assessment

The MNRF's Significant Wildlife Habitat Technical Guide (SWHTG) (MNR 2000) describes significant wildlife habitat (SWH) in four categories:

1. Seasonal concentration areas
2. Rare vegetation communities or specialized habitats for wildlife
3. Habitat for SOCC (excluding habitat for Endangered or Threatened species)
4. Animal movement corridors

Habitats within the Study Area were assessed for candidate SWH, as defined in the Ecoregion 7E Criterion Schedule (MNRF 2015). Wildlife observations and evidence of wildlife (e.g., tracks, burrows, vocalizations) were recorded during the site visit. Targeted species-use surveys are generally required to determine if candidate features qualify as confirmed SWH. Because targeted species-use surveys were not conducted, identified SWH features were considered candidate, unless they were confirmed through direct observations or background review.

3.1.5 Species at Risk Habitat Suitability Assessment

SAR habitat suitability assessments were completed in the Study Area concurrently during the site visit.

These assessments focused on the identification of potential SAR habitat features (e.g., SAR bat maternity roost trees) or occurrences (e.g., butternut). SAR habitat suitability assessments were completed for species protected under the provincial ESA that may occur in the area, including species identified in the NHIC database and Ontario wildlife atlases during the literature review process. If encountered, these features were identified, recorded, and assessed for potential use by SAR and wildlife species occurrences were observed by sight, sound and/or through distinctive signs (e.g., tracks, scat).

3.1.6 Fish Habitat Assessment

The fish habitat assessment characterized potential fish habitat in the Wilson D&W Drain based on the presence/absence of key aquatic habitat elements such as instream cover, aquatic and riparian vegetation and water depth. The Wilson D&W Drain was surveyed by walking the shoreline and visually documenting physical habitat characteristics. If present, fish habitat features were identified, characterized, and recorded digitally with Stantec field forms on data collection software (ArcGIS) and a digital camera. Fish community sampling was not conducted during the field investigation.

3.2 Results

A photographic record of the Site and the natural heritage features is provided in **Appendix B**.

3.2.1 Vegetation

No SAR or SOCC plant species were observed within or adjacent to the Site. A large restoration area comprised of rows of planted saplings with a ground layer of installed prairie grasses and other prairie species occupies most of the Site (**TAGM3 / MEGM2, Figure 2, Appendix A**). Because the tallgrass prairie on the Site was installed as a restoration opportunity and is not a remnant prairie, this area is less significant from a vegetation perspective than a remnant naturally occurring prairie. Naturally occurring remnant tallgrass prairie communities are unique in Ontario and considered a rare type of vegetation community in Ontario. Despite the artificial origin of this prairie area, opportunities for SAR and SOCC plants to occur exist.

The wooded ravine located at the northern end of the Site is within the Lypp's Beach PSW. It is situated along the Wilson D&W Drain. This area is a combination of lowland floodplain and more swampy areas closer to the watercourse (FOD7/SWDM4). There is a lowland floodplain forest dominated by black walnut (FODM7-4) located within the Study Area extending slightly into the Site. This FODM7-4 community type is rare in Ontario with a provincial rank of S2S3 (NHIC 2023).

ELC mapping within the Site and wider Study Area is shown on **Figure 2**, Appendix A. Vegetation communities present within or immediately adjacent the Site are described in **Table 3** (below).

Table 3: Ecological Land Classification (ELC Vegetation Types

ELC TYPE	Community Description
Forest /Swamp	
FODM7 Fresh – Moist Lowland Deciduous Forest / **SWDM4** Mineral Deciduous Swamp	This lowland wooded ravine is situated on either side of Wilson D&W Drain within the Site and larger 120m Study Area. It is dominated by mature canopy trees of trees of eastern cottonwood, soft maple (silver or Freeman's), common hackberry and to a lesser extent white elm and black walnut. Sub-canopy and understory tree layers contain an abundance of Manitoba maple, common hackberry and hawthorn.
FODM7-4 Fresh – Moist Black Walnut Lowland Deciduous Forest	This lowland section of forest is situated on either side of Wilson D&W Drain. It is dominated by black walnut trees.

Table 3: Ecological Land Classification (ELC Vegetation Types

ELC TYPE	Community Description
Plantation	
TAGM3 Deciduous Plantation **MEGM2** Fresh - Moist Graminoid Tallgrass Prairie	This restoration area has been planted in rows with several tree saplings such as swamp pin oak, eastern cottonwood and red cedar. Occasional saplings of soft maple, bur oak, dogwood, hazel and American sycamore are also planted. The trees currently provide a limited canopy cover due to their small size and the ground layer is densely covered in yellow Indiangrass, a tallgrass prairie species. Other tallgrass grass species (old switch panicgrass and Canada wildrye) occur occasionally. Mountain mints (*Pycnanthemum* sp.), asters and common teasel also occur occasionally.
TAGM3 Deciduous Plantation	This area was densely planted in rows with a variety of deciduous trees. The trees are maturing, but not yet at a mature size. Swamp pin oak and bur oak occur abundantly. Black locust, black walnut, honey locust and soft maple occur occasionally. Shrubs of grey dogwood and staghorn sumac occur commonly in open pockets of the plantation.
Hedgerows	
THDM3 Dry – Fresh Deciduous Hedgerow Thicket	This immature row of trees and shrubs is dominated by young Manitoba maple, common hackberry and riverbank grape vine. White mulberry, staghorn sumac and grey dogwood occur occasionally. A few more mature common hackberry occur sporadically throughout.
FODM11 Naturalized Deciduous Hedgerow	This small section of hedgerow is dominated by mature open-grown common hackberry, which occurs more frequently than the mature black walnut. Dogwoods and red cedar occur in the understory layers throughout the hedgerow.

3.2.2 Bird Nests

Bird nests were observed in various locations within the Site ecosites (TAGM3 / MEGM2 and FODM7/SWDM4), although the species were unknown.

3.2.3 Bats

There were many trees with features suitable to support bat maternity roost habitat in the FODM7 vegetation community (**Figure 2, Appendix A**). There were no suitable trees for bat maternity roost habitat within the TAGM3 / MEGM2 ecosite. Individual trees were not recorded as the Project is not proposed within the treed PSW feature (FODM7/SWDM4 & FODM7-4).

As per MECP guidance, any trees that are greater than 10 cm diameter breast height (DBH) are potentially suitable for maternity roost habitat, and as such, if trees removal is required for the Project, bat SAR should be considered.

3.2.4 Significant Wildlife Habitat

Evaluation criteria and the SWH assessment results appear in **Appendix C.** A brief description of the four SWH categories is provided below:

Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather at one time of the year, or where several species congregate. Only the best examples of these concentration areas are usually designated as SWH.

- **Bat Maternity Colonies (Candidate)**: Habitat for Bat Maternity Colonies occurred within the Study Area in the FODM7/SWDM4, FODM7-4 and FODM11 vegetation communities.
- **Migratory Butterfly Stopover Areas (Candidate)**: Habitat for Migratory Butterfly Stopover Areas is present within the Study Area. The ecosites within the Study Area and the associated contiguous habitat outside of the Study Area provides > 10 ha of suitable field and forest habitat and the Study Area is within 5 km to Lake Erie.
- **Landbird Migratory Stopover Areas (Candidate)**: Habitat for Landbird Migratory Stopover Areas is present within the Study Area. The ecosites within the Study Area and the associated contiguous habitat outside of the Study Area provides > 5 ha of suitable forest habitat and the Study Area is within 2 km to Lake Erie. There is also a variety of habitat types in the Study Area and nearby lands including forest, grassland, and wetland.

Rare Vegetation Communities and Specialized Habitat for Wildlife

Rare or specialized habitats are two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. It is assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant. Specialized habitats are microhabitats that are critical to some wildlife species.

- **Other Rare Vegetation Communities (Confirmed)**: The FODM7-4 vegetation community identified in the Study Area is considered a Provincially Rare S2 / S3 community.
- **Seeps and Springs (Candidate):** Suitable habitat for Seeps and Springs is present in the Study Area within the FODM7 / SWDM4 vegetation community.

Species of Conservation Concern

There are four types of SOCC: those which are rare, those whose populations are significantly declining, those which have been identified as being at risk from certain common activities and those with relatively large populations in Ontario compared to the remainder of the globe.

Rare species are considered at five levels: globally rare, federally rare with designations by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), provincially rare with designations by the Committee on the Status of Species at Risk in Ontario (COSSARO), regionally rare (at the Site Region level), and locally rare (in the municipality or Site District). This is also the order of priority that should be assigned to the importance of maintaining species. While these species are considered rare, they are not regulated under the ESA or the federal *Species at Risk Act*. Species designated as Special Concern provincially or federally are included as SOCC. A habitat assessment for SOCC that fall into this category that have ranges that overlap with the Study Area is in **Appendix C**. The presence or absence of these species would need to be assessed through completion of targeted surveys at the appropriate time of year.

Some species have been identified as being susceptible to certain practices, and their presence may result in an area being designated significant wildlife habitat. Examples include species vulnerable to habitat loss such as marsh, open country, and shrub/early successional breeding birds.

The results of the SOCC habitat assessment are presented in **Appendix C**. Candidate habitat for four (4) of the 13 SOCC identified in the background review was present in the Study Area which includes the following species:

- Eastern Wood-Pewee
- Wood Thrush
- Monarch
- Swamp Rose-mallow
- Snapping Turtle

Animal Movement Corridors

Migration corridors are areas that are traditionally used by wildlife to move to one habitat from another. This is usually in response to different seasonal habitat requirements. There is one type of animal movement corridor in Ecoregion 7E - amphibian movement corridors.

Candidate amphibian movement corridor is not present within the Study Area.

3.2.5 Species at Risk

Suitable habitat for ten (10) SAR identified in the background review was present in the Study Area.

The treed floodplain and ravine communities at the north end of the site (FODM7/SWDM4 & FODM7-4) provide suitable habitat for SAR bats. Candidate bat maternity roosting trees occur in these features. These features also provide suitable habitat for the chimney swift and red-headed woodpecker.

All treed areas within the Site including the young plantation / tallgrass prairie (TAGM3 / MEGM2) provide suitable habitat for Eastern Foxsnake. Further discussion of Eastern Foxsnake is provided below because there is Regulated Habitat under the ESA for this species on the Site / in the Study Area.

The SAR habitat suitability assessment is provided in **Appendix D**.

The list of SAR identified as potentially present in the Study Area is provided in Table 4.

Table 4: SAR Identified as Potentially Present in the Study Area based on the Habitat Suitability Assessment

Species	Habitat Suitability Description
Mammals	
Eastern Small-footed Myotis	Suitable habitat in treed habitat present in Study Area
Little Brown Myotis	Suitable habitat in treed habitat present in Study Area
Northern Myotis	Suitable habitat in treed habitat present in Study Area
Tricoloured Bat	Suitable habitat in treed habitat present in Study Area
Birds	
Chimney Swift	Suitable habitat in treed habitat present in Study Area
Eastern Meadowlark	Suitable habitat is present in Study Area
Red-headed Woodpecker	Suitable habitat in treed habitat present in Study Area
Yellow-breasted Chat	Suitable habitat is present in Study Area
Plants	
Butternut	Suitable habitat is present in Study Area
Reptiles	
Eastern Foxsnake (Carolinian)	Suitable habitat in the Study Area – The Study Area and Site are considered Regulated Habitat for the Eastern Foxsnake under the ESA

Eastern Foxsnake

The Carolinian population of the Eastern Foxsnake is listed as an endangered species under the ESA and has regulated habitat under Ontario Regulation 242/08 of the ESA. According to the habitat regulation, protected sites include those used for nesting, hibernation, and communal shedding and basking, as well as areas within 1500 metres of an Eastern Foxsnake occurrence that are suitable for it to carry out its life processes (e.g., foraging and thermoregulation). The regulation applies where the snake occurs within the county of Essex.

According to the COSEWIC Status Report on the Eastern Foxsnake (COSEWIC 2008), the main habitat for this species in Essex/Kent County (Essex-Kent Regional Population) consists of unforested, early successional habitat. Hedgerows bordering farm fields and riparian zones along drainage canals are regularly used (COSEWIC 2008).

The most important components of Eastern Foxsnake habitat include the following, which are captured under the habitat regulation:

- hibernation sites
- egg laying (oviposition) sites
- shedding and basking (thermoregulation) sites

Other supporting habitat features include:

- shelter sites – sites that provide shelter include brush or branch piles, logs, stone piles, or other structures large enough for the snakes to seek refuge in.
- foraging habitat – The Eastern Foxsnake's main diet includes small mammals and birds (including eggs and nestlings). Areas that support rodents or breeding birds are likely to be ideal foraging habitat.
- seasonal movement corridors – include corridors between the other components of its habitat.

Further to these features, the habitat regulation also protects *any part of a prairie, savannah, hedge row, shoreline, marsh, old field, forest, sand dune or similar area that is being used by an Eastern Foxsnake (Carolinian population) or on which an Eastern Foxsnake (Carolinian population) directly depends to carry on its life processes.*

The presence of supporting features within these habitats generally increase the likelihood of Eastern Foxsnake occurrences. Supporting features would include, but are not limited to brush piles, branch prunings, rotting logs, log piles, stone piles, concrete, box culverts, large rocks, abandoned farm machinery and stone foundations.

The Study Area provides many of the preferred habitat types for the Eastern Foxsnake including forest, forest edge, watercourse, prairie, hedgerow, old field, rotting logs and log piles. Because the habitat within the Study Area is part of and contiguous with the Lypp's Beach PSW, and the Study Area is within 1500 m from a high accuracy record (2020) of Eastern Foxsnake, the habitat within the Study Area and the Site is considered Regulated and is protected under the ESA.

Based on the above assessment, there is a high potential for Eastern Foxsnake to be present in the Study Area. Consultation with MECP would be required to confirm requirements under the ESA. However, it is anticipated that permitting under the ESA will be required for development within the Site.

3.2.6 Fish Habitat

Within the Site, the Wilson D&W Drain is located in a woodland ravine with an active floodplain. The watercourse had a slow flowing and slightly meandering channel with run morphology and an average depth of 0.20 m and wetted width of 2.2 m. Watercourse substrates were predominantly fine sediments of silt, clay, and detritus with lower proportions of sand, and gravel. Bank soils were a fine silt sediment and were stable, supported by herbaceous, shrub and tree root systems. Instream and overhead cover were mostly provided by woody debris (fallen tree limbs, branches, and trunks). The channel did not appear to have been historically modified, which corresponds with the OMAFRA (2023) mapping that does not map the watercourse as a municipal drain. Fish migration barriers were not observed within the Site boundary; however, aerial imagery indicate that an approximately 65 m long segment of the watercourse may be located underground at Lake Crest Court, making upstream passage from Lake Erie into the watercourse unlikely.

Based on habitat characteristics documented by Stantec on March 2, 2023, Wilson D&W Drain provides fish habitat within the Study Area.

4 Natural Heritage Features

This section provides a summary of natural heritage features that were identified in the Study Area:

Natural Heritage Designations

- Lypp's Beach PSW

Significant Wildlife Habitat

- Candidate: Bat Maternity Colonies
- Candidate: Migratory Butterfly Stopover Area
- Candidate: Landbird Migratory Stopover Area
- Confirmed: Rare vegetation community FODM7-4
- Candidate: Seeps and Springs
- Suitable habitat for SOCC including Eastern Wood-pewee, Wood Thrush, Monarch, Swamp Rose-mallow, Snapping Turtle
- Candidate: Amphibian Movement Corridor

Species at Risk Habitat

- Suitable habitat for SAR plants: butternut
- Suitable habitat for SAR bats: Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tricoloured Bat
- Suitable habitat for SAR birds: Chimney Swift, Eastern Meadowlark, Red-headed Woodpecker and Yellow-breasted Chat
- Suitable habitat and Regulated Habitat (protected under the ESA) for the Eastern Foxsnake

Fish Habitat

- Fish habitat is present in Wilson D&W Drain

Section 6.4 outlines proposed field surveys to assess the presence of SOCC, SWH and SAR. SOCC and SAR presence and SWH designations can be refined after those surveys are complete.

5 Mitigation Measures

5.1 Design

During site selection and design, the following measures should be considered to reduce the risk of impacts to natural heritage:

Fish and Fish Habitat

- Design the project to avoid the need for in-water work where fish habitat has been identified.
- If applicable, apply natural channel design principles to design channel relocation.
- Design drainage system to reduce changes in drainage to watercourses that provide fish habitat.
- Design and plan activities and works such that loss of fish habitat or disturbance to fish habitat is reduced to the extent possible.
- Design stormwater management measures to reduce effects on watercourses that provide fish habitat to the extent possible.
- Design a rehabilitation/re-vegetation plan for long-term stability of areas disturbed during construction.
- For rock reinforcement below the normal high-water level (if required), use appropriately sized material and install at a similar slope to the existing, maintain a uniform bank/shoreline and maintain a natural bank/shoreline alignment such that it does not interfere with fish passage or alter the bankfull channel profile.

Wildlife and Terrestrial Habitat

- Limit infrastructure in woodland and wetland (if applicable) areas and adjacent lands (e.g. 30 m), to the extent possible.
- Plan to rehabilitate temporary disturbance areas with a native seed mix with a mix dependent of the existing vegetation community.

5.2 Construction

5.2.1 Standard Mitigation Measures

The following standard mitigation measures/best practices are provided to reduce potential impacts to natural heritage features during construction:

- Delineate the Project footprint with tree protection fencing prior to construction to reduce impacts to adjacent natural features.
- Wash, refuel and/or service equipment a minimum of 30 m from surface waters to reduce the risk of deleterious substances from entering surface waters. Check machinery regularly for fluid leaks.

- Thoroughly clean construction machinery prior to entering the site to reduce the potential for establishment / spread of invasive species.
- To reduce the potential for spread of insect pests such as the Emerald Ash Borer, trees cut should be disposed of onsite (either through spreading of wood chips or trees cut and sawed into logs).
- Develop a Spill Management Plan and have it on site for implementation in the event of an accidental spill. Keep an emergency spill kit on site.
- Stabilize and re-vegetate areas of disturbed/exposed soil, as soon as practicably possible with native seed mixes and woody vegetation.
- Maintain erosion and sediment control measures until the restoration measures have been assessed and determined to be secure and stable.

5.2.2 Erosion and Sediment Control

An erosion and sediment control (ESC) plan should be developed and employed during construction to reduce the risk of erosion and the entry of sediment into surface water and other natural features. Mitigation included in the plan should include the following measures:

- Implement project-specific temporary ESC measures per prior to starting work (e.g., silt fence and/or sediment logs).
- Keep additional ESC materials available on site to provide a contingency supply in the event of an emergency.
- Monitor and maintain erosion and sediment controls, as required. Controls are to be removed only after the soils of the construction area have stabilized and vegetation cover has re-established.
- Stabilize materials requiring stockpiling (fill, topsoil, etc.) and keep a safe distance (> 30 m) from watercourses.

5.2.3 Protection of Migratory Birds

The MBCA provides legal protection of migratory birds and their nests in Canada. Construction timing must consider restrictions imposed by the MBCA. To avoid damaging or disturbing bird nests and contravening the MBCA, the timing of any vegetation clearing should occur outside of the primary nesting period (i.e., the period when the percent of total nesting species is greater than 10% based on Environment Canada's Nesting Calendars and the period for which due diligence mitigation measures are generally recommended).

The primary nesting period (PNP) identified for southern Ontario is April 1 - August 31, although nesting also infrequently occurs outside of this period (Environment Canada 2014). Vegetation removal during this core nesting period is not recommended; however, if required, a nest survey may be carried out by a qualified person in simple habitats such as an urban park, a vacant lot with few possible nest sites, a previously cleared area, or a structure (Government of Canada 2022). If a migratory bird nest is located within the work area at any time, a no-disturbance buffer will be delineated. This buffer will be maintained for the entire duration of the nest activity, which will be determined using periodic checks by an avian biologist. The radius of the buffer generally varies from 5 m - 60 m depending on the sensitivity of the nesting species. The Project will not resume within the nest buffer until the nest is confirmed to be no longer active.

5.2.4 Wildlife Protection

The following mitigation measures are recommended to avoid impacts to wildlife during Project construction:

- A visual search of the work area will be conducted before work commences each day, particularly for the period when most wildlife is active (generally April 1 to October 31). Visual inspections will locate and avoid snakes, turtles, and other ground dwelling wildlife such as small mammals. Visual searches will include inspection of machinery and equipment left in the work area overnight prior to starting equipment.
- If wildlife is encountered, work at that location will stop, and the animal(s) will be permitted reasonable time to leave the work area on their own.
- Eastern Foxsnake are considered arboreal (climbers) and as such, exclusionary fencing is recommended to be 200 cm in height above ground (MNRF 2016). Specifications for reptile exclusion fencing should follow Best Practices Technical Note – Reptile and Amphibian Exclusion Fencing (MNR 2013) and Best Management Practices for Mitigating the Effects of Road Mortality on Amphibian and Reptile Species at Risk in Ontario (MNRF 2016). A terrestrial ecologist should be consulted during exclusionary fencing design.
- Any sediment and erosion control measures, such as fencing or blanket, utilized on the site during construction will avoid products with plastic mesh due to risk of entanglement of snakes or other wildlife.
- Any observations of species at risk or species of conservation concern (e.g., Eastern Foxsnake) should be reported to MECP and MNRF within 48 hours. Species at risk should not be handled, harassed, or moved in any way, unless they are in immediate danger.
- If wildlife handling and relocation (e.g., amphibians, reptiles) is anticipated during construction such as vegetation clearing or during in-water work, the Contractor must obtain a Wildlife Scientific Collectors Authorization from the MNRF prior to the commencement of work.

5.2.5 Protection of Fish and Fish Habitat

Although no work is proposed in Wilson D&W Drain, implementation of the following measures are recommended to protect fish and fish habitat during construction if in-water work is required:

- If in-water work is required, reduce the duration of in-water work to the extent possible.
- Conduct in-water work during periods of low flow to allow work in water to be isolated from flows.
- Schedule in-water work to occur during the applicable in-water work timing window.
- If in-water work is required, develop, and implement a project-specific fish relocation plan to relocate fish from within an in-water work area. The Contractor must obtain a Licence to Collect Fish for Scientific Purposes from the MNRF prior to the commencement of in-water work.
- Screen water intake pipes to prevent entrainment or impingement of fish following the measures as outlined in DFO's Interim Code of Practice for End-of-pipe Fish Protection Screens for Small Water Intakes in Freshwater (DFO 2022b).
- Where applicable, manage and treat dewatering discharge to reduce the risk of erosion and/or release of sediment-laden or contaminated water to surface waters.

6 Permitting Considerations

6.1 Conservation Authorities

6.1.1 Conservation Authorities Act

Development within the ERCA Regulation Limit is subject to the policies outlined in Ontario Regulation 158/06 under the *Conservation Authorities Act.* Regulated areas are present on the Site, including areas associated with the wetland, watercourse, and floodplains. Prior to any new development in regulated areas, including the placement or removal of fill material, grading activities, and the erection of any buildings or structures, and/or the alteration of regulated features, written approval (i.e., a Permit or a Letter of Permission) will be required from ERCA. Consultation with ERCA is recommended to determine permitting requirements.

6.2 Ministry of the Environment, Conservation and Parks

6.2.1 Endangered Species Act, 2007

The provincial ESA prohibits the killing, harming, harassing, capturing, or taking of a living member of a species listed as Threatened, Endangered or Extirpated by the Species at Risk in Ontario (SARO) list (O. Reg 230/08) (S.9), or the damage to habitat of similarly designated species (S.10). An exception is where a permit is issued under S.17(2) of the same act, or the Activity is registered under Ontario Regulation 242/08.

Based on preliminary assessment, impacts to SAR and/or SAR habitat may occur due to the Project. As such, targeted surveys to determine the presence/absence of SAR are recommended for the Study Area (Section 6.4).

6.3 Fisheries And Oceans Canada

6.3.1 Fisheries Act

The *Fisheries Act* prohibits causing the death of fish and he harmful alteration, disruption, or destruction (HADD) of fish habitat, unless authorized by the Minister of Fisheries, Oceans, and the Canadian CoastGuard. This applies to work being conducted in waters that support fish and fish habitat. The fish and fish habitat protection provisions of the *Fisheries Act* apply to all fish and fish habitat in Canada.

Following guidance and criteria provided on DFO's website regarding mitigation, waterbody types and codes of practice, proponents determine whether their projects in or near water will require review by DFO. In cases where impacts to fish and fish habitat cannot be avoided, proponents submit a Request for Review form to DFO. DFO will review the project to identify the potential risks of the project to the conservation and protection of fish and fish habitat and will work with the proponent to provide advice and guidance on how to comply with the *Fisheries Act*. If the Project can avoid impacts to fish and fish habitat,

project approval is not required. If impacts cannot be avoided, proponents must apply for a *Fisheries Act* Authorization, and may be required to develop a habitat offsetting or compensation plan.

Details of the proposed infrastructure location will be assessed to determine the need for review by DFO; however, if in-water work is not proposed, DFO review under the *Fisheries Act* will not likely be required. If the need for in-water work is identified, design details and construction methods will need to be reviewed to determine if the Project should be reviewed by DFO under the *Fisheries Act* through the submission of a Request for Review form.

6.4 Survey Recommendations

The following studies are recommended to determine if SAR and SOCC are present in the Study Area:

- **Birds**: Breeding bird surveys – Three surveys during the breeding season, from May to July
- **Insects**: Butterfly migration surveys to document presence / absence of Migratory Butterfly Stopover Area – three surveys, with one survey in late August, and two surveys in early September
- **Plants**: Botanical survey – Two surveys, one in each July and September
- **Fish**: If the Project requires work below the normal high-water level (bankfull width) of Wilson D&W Drain, fish community sampling is recommended, to support review of the project by DFO and to refine mitigation measures with respect to fish and fish habitat.

Excluded Surveys

- Surveys for snakes (Eastern Foxsnake) are not recommended because the Study Area and Site are already considered Regulated Habitat for the species and the habitat is protected regardless of if snake surveys show presence or absence.
- Survey for SAR bats is not recommended because the development proposal does not include remove of potential SAR bat habitat. If there is potential for the project to removal large diameter trees (10 cm diameter at breast height); those trees should be assessed for habitat suitability and subject to targeted use surveys in June (acoustic monitoring) to determine if SAR are present and identify authorization requirements.
- Survey to document presence / absence of Landbird Migratory Stopover Area is not recommended. The Study Area is assumed to provide SWH for Landbird Migratory Stopover Area.

7 Next Steps

The following steps are recommended as part of detailed design:

- Complete field surveys recommended in Section 6.4
- Consultation with MECP once design details and staging plans are available to confirm mitigation measures and determine authorization requirements, if any, for provincially regulated SAR.
- If in-water work is required in Wilson D&W Drain, prepare a Request for Review form, and submit to DFO for review under the *Fisheries Act*

8 Closure

Stantec was retained by the Town of Essex to conduct a natural heritage assessment and constraints analysis in support of the Municipal Class Environmental Assessment (EA) for the Colchester South Sewage Works Expansion.

Based on the site conditions and assessment of SAR, SOCC and SWH, negative impacts on the habitat features or species noted in this assessment may occur from Project construction. Targeted surveys to document presence/absence of SAR, SOCC and SWH in the Study Area is recommended.

9 References

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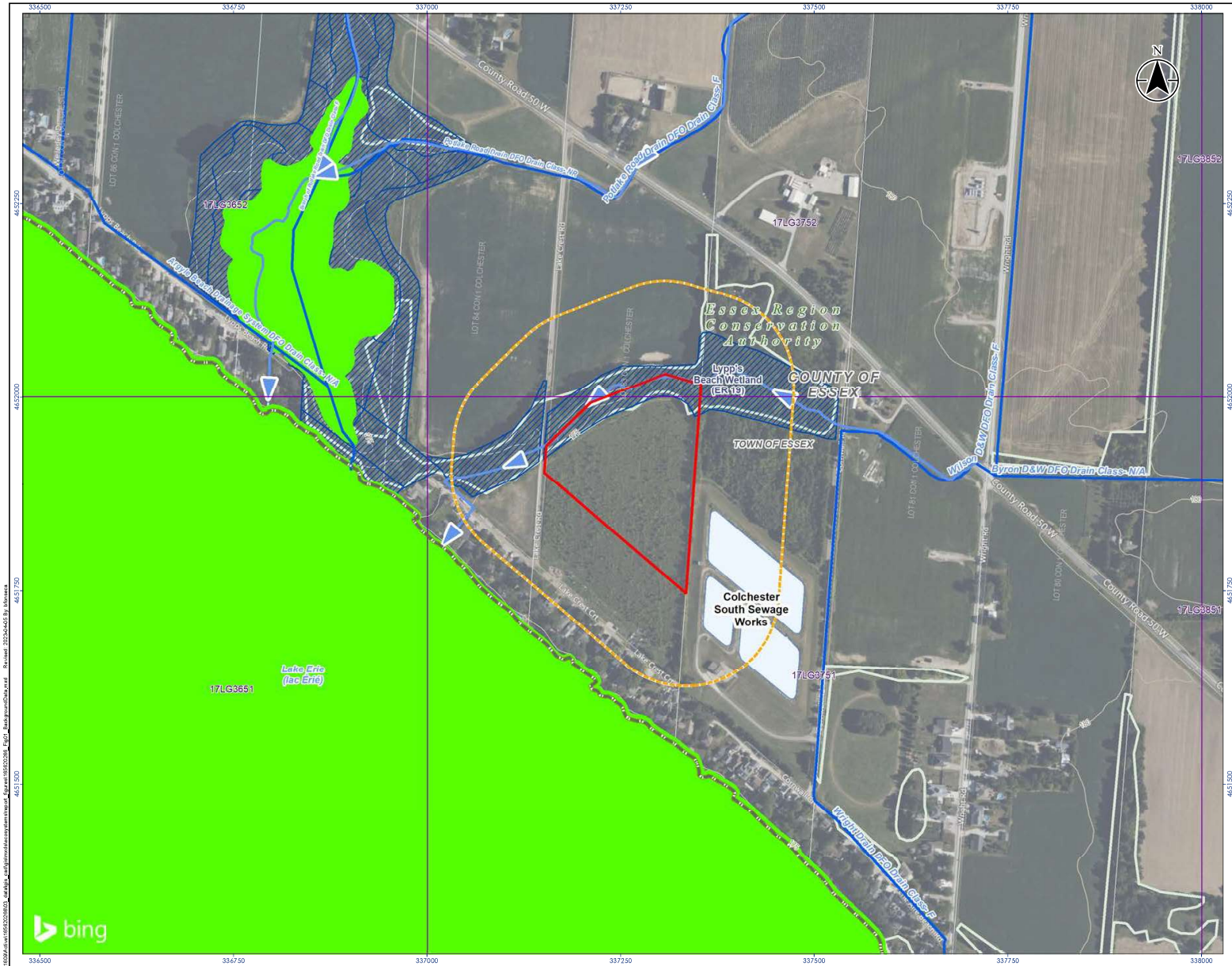
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APPENDICES

Appendix A Figures



Stantec

Legend

- Site Boundary
- Study Area (120 m)
- Constructed Drain
- Watercourse (Permanent)
- Flow Direction
- Conservation Authority Administrative Boundary
- Aquatic Species at Risk Distribution
- Waterbody
- Wetland, Provincially Significant
- Wooded Area
- Lot
- Municipal Boundary, Upper
- Municipal Boundary, Lower
- 1 km UTM Grid

0 100 200 m

1:5,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Orthoimagery © 2023 Microsoft Corporation © 2023 Maxar ©CNES (2023) Distribution Airbus DS © 2023 TomTom



Project Location
Town of Essex

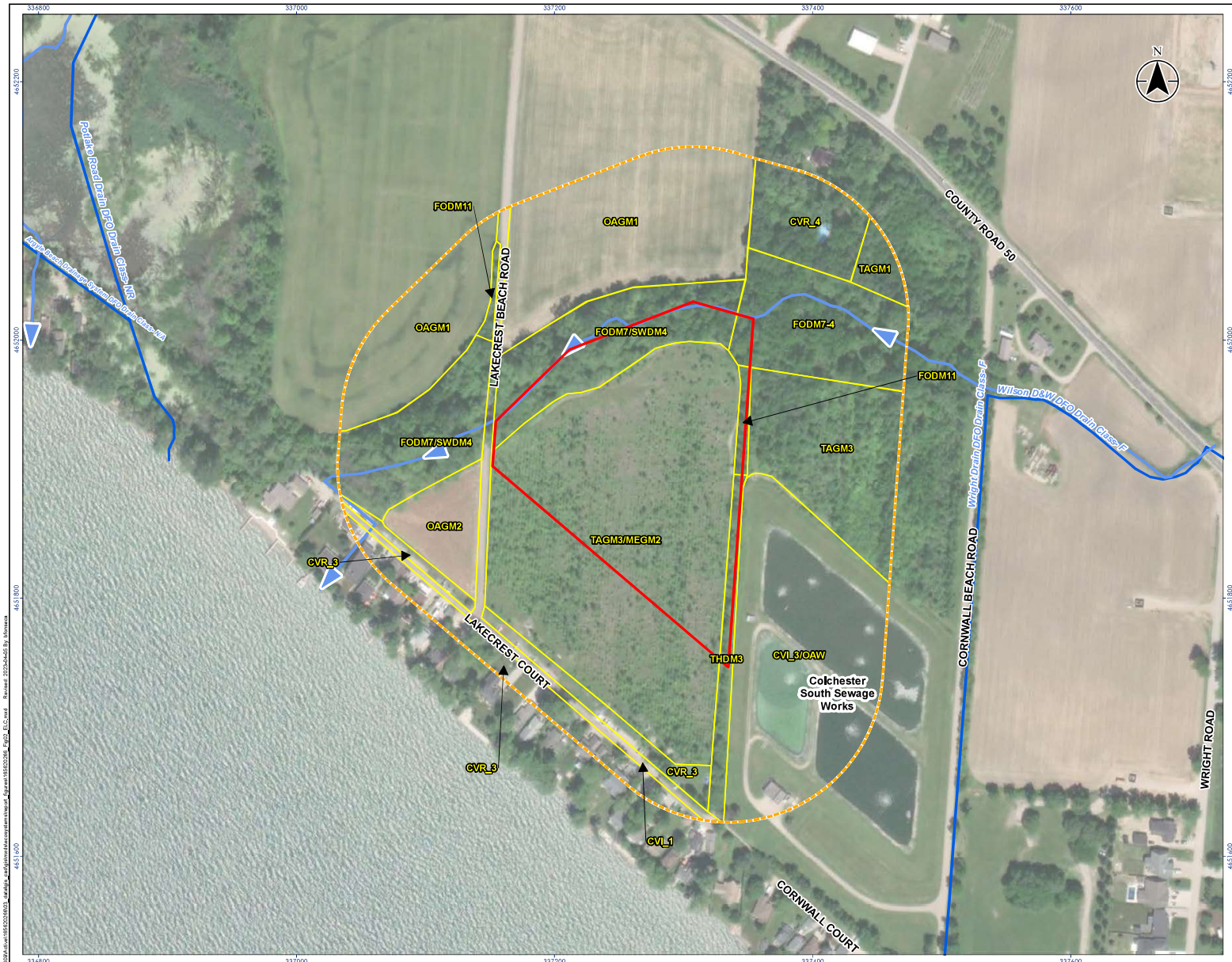
165620266 REV4
Prepared by BF on 2023-04-05
Technical Review by SE on 2023-02-14

Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION – CLASS EA: NATURAL HERITAGE ASSESSMENT

Figure No.
1

Title
Background Data

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Stantec

Legend

- Site Boundary (Approx.)
- Study Area (120 m)
- ELC Communities
- Constructed Drain
- Watercourse (Permanent)
- Flow Direction

ELC Description

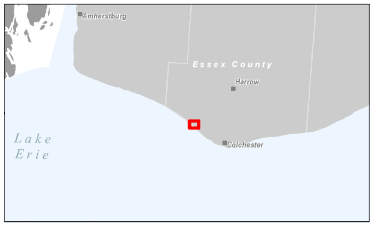
- **CVI_1** - Transportation
- **CVI_3/OAW** - Sewage and Water Treatment/Open Water
- **CVR_3** - Single Family Residential
- **CVR_4** - Rural Property
- **FODM11** - Naturalized Deciduous Hedge-row Ecosite
- **FODM7-4** - Fresh – Moist Black Walnut Lowland Deciduous Forest Type
- **FODM7/SWDM4** - Fresh – Moist Lowland Deciduous Forest Ecosite/Mineral Deciduous Swamp Ecosite
- **OAGM1** - Annual Row Crops
- **OAGM2** - Perennial Cover Crops
- **TAGM1** - Coniferous Plantation
- **TAGM3/MEGM2** - Deciduous Plantation/Fresh - Moist Graminoid Tallgrass Prairie Ecosite
- **TAGM3** - Deciduous Plantation
- **THDM3** - Dry - Fresh Deciduous Hedgerow Thicket Ecosite

0 50 100 m

1:3,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Orthoimagery Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Project Location
Town of Essex

165620266 REV4
Prepared by BF on 2023-04-05

Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION – CLASS EA: NATURAL HERITAGE ASSESSMENT

Figure No.
2

Title
Ecological Land Classification

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Appendix B Photographic Record



Photo 1: Northwest edge of the Colchester South Sewage Works (CVI_3/OAW). Facing west into the restored deciduous plantation/ dry grass prairie (TAGM3/MEGM2).



Photo 2: Facing north within the Colchester South Sewage Works (CVI_3/OAW). Sewage pond and surrounding conditions.



Photo 3: Facing north from the Colchester South Sewage Works (CVI_3/OAW). Sewage pond and surrounding conditions.



Photo 4: Facing west in restored deciduous plantation/dry grass prairie (TAGM3/MEGM2) field conditions.



Photo 5: Facing south in restored deciduous plantation/dry grass prairie (TAGM3/MEGM2) field conditions.



Photo 6: Wilson D&W Drain condition in the west end of the Study Area, facing northeast in deciduous forest habitat (FODM7/SWDM4).



Photo 7: Wilson D&W Drain condition in the west end of the Study Area, facing northeast in deciduous forest habitat (FODM7/SWDM4).



Photo 8: Top of Wilson D&W Drain bank, in the northwest portion of the in lowland deciduous forest (FODM7/SWDM4) within the Site.



Photo 9: Wilson D&W Drain condition in lowland deciduous forest (FODM7/SWDM4), facing northeast, looking upstream.



Photo 10: Wilson D&W Drain condition further upstream in lowland deciduous forest (FODM7/SWDM4), facing southwest, looking downstream.



Photo 11: Ravine at north end of the Study Area in lowland deciduous forest (FODM7/SWDM4), facing northeast.

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Appendix C Significant Wildlife Habitat Assessment

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Seasonal Concentration Areas			
Waterfowl Stopover and Staging Area (Terrestrial)	Fields with sheet water or utilized by tundra swans during spring (mid-March to May), or annual spring melt water flooding found in any of the following Community Types: Meadow (CUM1), Thicket (CUT1). Agricultural fields with waste grains are commonly used by waterfowl, and these are not considered SWH unless used by Tundra swans in the Long Point, Rondeau, Lake St. Clair, Grand Bend and Point Pelee Areas.	ELC assessment was used to assess features within the Study Area that may support waterfowl stopover and staging areas (terrestrial).	**No candidate habitat** for Waterfowl Stopover and Staging Areas (Terrestrial) occurred within the Study Area.
Waterfowl Stopover and Staging Area (Aquatic)	The following Community Types: Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Aquatic (SA), Deciduous Swamp (SWD). Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. The combined area of the ELC ecosites and a 100 m radius area is the SWH. Sewage treatment ponds and storm water ponds do not qualify as a SWH; however, a reservoir managed as a large wetland or pond/lake does qualify.	ELC assessment was used to assess features within the Study Area that may support waterfowl stopover and staging areas (aquatic).	**No candidate habitat** for Waterfowl Stopover and Staging Areas (Aquatic) occurred within the Study Area.
Shorebird Migratory Stopover Area	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of amour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a significant wildlife habitat. The following community types: Meadow Marsh (MAM), Beach/Bar (BB), or Sand Dune (SD).	ELC assessment was used to assess features within the Study Area that may support migratory shorebirds.	**No candidate habitat** for Shorebird Migratory Stopover Area occurred within the Study Area.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Raptor Wintering Area	At least one of the following Forest Community Types: Deciduous Forest (FOD), Mixed Forest (FOM) or Coniferous Forest (FOC), in combination with one of the following Upland Community Types: Meadow (CUM), Thicket (CUT), Savannah (CUS), Woodland (CUW) (<60% cover) that are >20 ha and provide roosting, foraging and resting habitats for wintering raptors. Upland habitat (CUM, CUT, CUS, CUW), must represent at least 15 ha of the 20 ha minimum size.	ELC assessment was used to assess features within the Study Area that may support wintering raptors.	**No candidate habitat** for Raptor Wintering Area occurred within the Study Area.
Bat Hibernacula	Hibernacula may be found in caves, mine shafts, underground foundations and karsts. May be found in these Community Types: Crevice (CCR), Cave (CCA).	ELC assessment was used to assess features within the Study Area that may support bat hibernacula.	**No candidate** habitat for Bat Hibernacula occurred within the Study Area.
Bat Maternity Colonies	Maternity colonies considered significant wildlife habitat are found in forested ecosites. Either of the following Community Types: Deciduous Forest (FOD) or Mixed Forest (FOM), that have>10/ha wildlife trees >25 cm diameter at breast height (dbh). Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. Northern Myotis prefer contiguous tracts of older forest cover for foraging and roosting in snags and trees. Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.	ELC assessment was used to assess features within the Study Area that may support bat maternity colonies.	**Candidate** habitat for Bat Maternity Colonies occurred within the Study Area in the FODM7/SWDM4, FODM7-4 and FODM11 ecosites.
Turtle Wintering Areas	Snapping and Midland Painted turtles utilize ELC community classes: Swamp (SW), Marsh (MA) and	ELC assessment was used to assess features within the Study Area that may support areas of	**No candidate** habitat for Turtle Wintering Areas occurred within the Study Area.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
	Open Water (OA). Shallow water (SA), Open Fen (FEO) and Open Bog (BOO). Northern Map turtle- open water areas such as deeper rivers or streams and lakes can also be used as over-wintering habitat. Water has to be deep enough not to freeze and have soft mud substrate. Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen.	permanent standing water but not deep enough to freeze.	
Snake Hibernacula	Hibernation occurs in sites located below frost lines in burrows, rock crevices, broken and fissured rock and other natural features. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. Any ecosite in southern Ontario other than very wet ones may provide habitat. The following Community Types may be directly related to snake hibernacula: Talus (TA), Rock Barren (RB), Crevice (CCR), Cave (CCA), and Alvar (RBOA1, RBSA1, RBTA1).	ELC surveys and wildlife assessments were used to assess features within the Study Area that may support snake hibernacula.	**No candidate** habitat for Snake Hibernacula occurred within the Study Area.
Colonial-Nesting Bird Breeding Habitat (Bank and Cliff)	Eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos, or barns found in any of the following Community Types: Meadow (CUM), Thicket (CUT), Bluff (BL), Cliff (CL). Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. Does not include a licensed/permitted Mineral Aggregate Operation.	ELC assessment was used to assess features within the Study Area that may support colonial bird breeding habitat.	**No candidate** habitat for Colonial - Nesting Bird Breeding Habitat (Bank and Cliff) within the Study Area.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs)	Identification of stick nests in any of the following Community Types: Mixed Swamp (SWM), Deciduous Swamp (SWD), Treed Fen (FET). The edge of the colony and a minimum 300 m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0 ha with a colony is the SWH. Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.	ELC assessment was used to assess features within the Study Area that may support colonial bird breeding habitat (Trees/Shrubs).	**No candidate** habitat for Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs) within the Study Area.
Colonial-Nesting Bird Breeding Habitat (Ground)	Any rocky island or peninsula within a lake or large river. For Brewer's Blackbird close proximity to watercourses in open fields or pastures with scattered trees or shrubs found in any of the following Community Types: Meadow Marsh (MAM1-6), Shallow Marsh (MAS1-3), Meadow (CUM), Thicket (CUT), Savannah (CUS).	ELC assessment was used to assess features within the Study Area that may support colonial bird breeding habitat (Ground).	**No candidate** habitat for Colonial-Nesting Bird Breeding Habitat (Ground) within the Study Area.
Migratory Butterfly Stopover Areas	Located within 5 km of Lake Erie or Ontario. A combination of ELC communities, one from each land class is required: Field (CUM, CUT, CUS) and Forest (FOC, FOM, FOD, CUP). Minimum of 10 ha in size with a combination of field and forest habitat present.	ELC assessment was used to assess features within the Study Area that may support migratory butterfly stopover areas.	**Candidate** habitat for Migratory Butterfly Stopover Areas is present within the Study Area. The ecosites within the Study Area and the associated contiguous habitat outside of the Study Area provides > 10 ha of suitable field and forest habitat and the Study Area is within 5 km to Lake Erie.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Landbird Migratory Stopover Areas	The following community types: Forest (FOD, FOM, FOC) or Swamp (SWC, SWM, SWD). Woodlots must be >5 ha in size and within 5 km of Lake Ontario or Lake Erie – woodlands within 2 km of Lake Ontario and Lake Erie are more significant.	ELC surveys and GIS analysis were used to assess features within the Study Area that may support landbird migratory stopover areas.	**Candidate** habitat for Landbird Migratory Stopover Areas is present within the Study Area. The ecosites within the Study Area and the associated contiguous habitat outside of the Study Area provides > 5 ha of suitable forest habitat and the Study Area is within 2 km to Lake Erie. There is also a variety of habitat types in the Study Area and nearby lands including forest, grassland, and wetland.
Deer Winter Congregation Areas	Woodlots typically > 100 ha in size unless determined by the MNR as significant. (If large woodlots are rare in a planning area >50 ha.) All forested ecosites within Community Series: FOC, FOM, FOD, SWC, SWM, SWD. Conifer plantations much smaller than 50 ha may also be used.	No studies required as the MNR determines this habitat.	**No candidate** habitat for Deer Winter Congregation Areas occurs within the Study Area.
Rare Vegetation Communities			
Cliffs and Talus Slopes	A Cliff is vertical to near vertical bedrock >3 m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris. Any ELC Ecosite within Community Series: TAO, TAS, TAT, CLO, CLS, CLT. Most cliff and talus slopes occur along the Niagara Escarpment.	ELC assessment was used to assess features within the Study Area that would be considered cliffs or talus slopes.	No cliffs or talus slopes were identified within the Study Area. **No candidate** wildlife habitat for Cliffs and Talus Slopes occurs within the Study Area.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Sand Barrens	Sand barrens typically are exposed sand, generally sparsely vegetated and cause by lack of moisture, periodic fires and erosion. Vegetation can vary from patchy and barren to tree covered but less than 60%. Any of the following Community Types: SBO1 (Open Sand Barren Ecosite), SBS1 (Shrub Sand Barren Ecosite), SBT1 (Treed Sand Barren Ecosite).	ELC assessment was used to assess features within the Study Area that would be considered to be sand barrens.	No sand barrens were identified within the Study Area. **No candidate** wildlife habitat for Sand Barrens occurs within the Study Area.
Alvars	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover. Any of the following Community Types: ALO1(Open Alvar Rock Barren Ecosite), ALS1 (Alvar Shrub Rock Barren Ecosite), ALT1 (Treed Alvar Rock Barren Ecosite), FOC1 (Dry-Fresh Pine Coniferous Forest), FOC2 (Dry-Fresh Cedar Coniferous Forest), CUM2 (Bedrock Cultural Meadow), CUS2 (Bedrock Cultural Savannah), CUT2-1 (Common Juniper Cultural Alvar Thicket), or CUW2 (Bedrock Cultural Woodland). An Alvar site > 0.5 ha in size.	ELC assessment was used to assess features within the Study Area that would be considered to be alvar communities.	No alvars were identified within the Study Area. **No candidate** wildlife habitat for Alvars occurs within the Study Area.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Old-growth Forest	Old-growth forests tend to be relatively undisturbed, structurally complex, and contain a wide variety of trees and shrubs in various age classes. These habitats usually support a high diversity of wildlife species. No minimum size criteria t in any of the following Community Types: FOD (Deciduous Forest), FOM (Mixed Forest), FOC (Coniferous Forest). Forests greater than 120 years old and with no historical forestry management was the main criteria when surveying for old-growth forests.	ELC assessment was used to assess features within the Study Area that would be considered to be old-growth forest communities.	No old growth forests were identified within the Study Area. **No candidate** wildlife habitat for Old-growth Forest occurs within the Study Area.
Savannahs	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). Any of the following Community Types: TPS1 (Dry-Fresh Tallgrass Mixed Savannah Ecosite), TPS2 (Fresh-Moist Tallgrass Deciduous Savannah Ecosite), TPW1 (Dry-Fresh Black Oak Tallgrass Deciduous Woodland Ecosite), TPW2 (Fresh-Moist Tallgrass Deciduous Woodland Ecosite), CUS2 (Bedrock Cultural Savannah Ecosite).	ELC assessment was used to assess features within the Study Area that would be considered to be savannah communities.	Savannah were not identified within the Study Area. **No candidate** wildlife habitat for Savannahs occurs within the Study Area.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Tall-grass Prairies	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). Any of the following Community Types: TPO1 (Dry Tallgrass Prairie Ecosite), TPO2 (Fresh-Moist Tallgrass Prairie Ecosite).	ELC assessment was used to assess features within the Study Area that would be considered to be tall-grass communities.	Although tall-grass prairie has been identified within the Site, this vegetation community has been installed and is not a naturally occurring community. As such, the TAGM3 / MEGM2 vegetation community does not meet the criteria for Tall-grass Prairie. **No candidate** wildlife habitat for Tall-grass Prairies occurs within the Study Area.
Other Rare Vegetation Communities	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG.	ELC assessment was used to assess features within the Study Area that would be considered to be other rare vegetation communities.	**Confirmed SWH**: The FODM7-4 vegetation community identified in the Study Area is considered a Provincially Rare S2 / S3 community.
Specialized Habitat for Wildlife			
Waterfowl Nesting Area	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4. Note: includes adjacency to Provincially Significant Wetlands.	ELC assessment was used to assess features within the Study Area that may support nesting waterfowl. Habitats adjacent to wetlands without standing water were not considered candidate SWH.	**No candidate** wildlife habitat for Waterfowl Nesting Area occurs within the Study Area.
Bald Eagle and Osprey nesting, Foraging, and Perching Habitat	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. Nests located on man-made objects are not to be included as SWH (e.g., telephone poles and constructed nesting platforms). ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds, and wetlands.	ELC surveys and Woodland Assessments were used to assess features within the Study Area that may support nesting, foraging, and perching habitat for large raptors.	**No candidate** wildlife habitat for Bald Eagle and Osprey nesting, Foraging, and Perching Habitat occurs within the Study Area.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Woodland Raptor Nesting Habitat	All natural or conifer plantation woodland/forest stands combined >30 ha and with >4 ha of interior habitat. Interior habitat determined with a 200 m buffer. Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	ELC surveys, Woodland Assessments and GIS analysis were used to assess features within the Study Area that may support nesting habitat for woodland raptors.	There is no woodland/forest stands combined >30 ha or >4 ha interior habitat within the Study Area. **No candidate** wildlife habitat for Woodland Raptor Nesting Habitat occurs within the Study Area.
Turtle Nesting Areas	Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC Ecosites: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, BOO1, FEO1 Best nesting habitat for turtles is close to water, away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.	ELC surveys and GIS analysis were used to assess features within the Study Area that may support turtle nesting areas.	**No candidate** wildlife habitat for Turtle Nesting Areas occurs within the Study Area.
Seeps and Springs	Seeps/Springs are areas where ground water comes to the surface. Often, they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs. Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system	ELC surveys and GIS analysis were used to assess features within the Study Area that may support Seeps and Springs.	**Candidate** habitat for Seeps and Springs is present in the Study Area within the FODM7 / SWDM4.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Amphibian Breeding Habitat (Woodland)	All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD Presence of a wetland, lake, or pond within or adjacent (within 120 m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat	ELC assessment was used to assess features within the Study Area that may support woodland breeding amphibians.	**No candidate** wildlife habitat for Amphibian Breeding Habitat (Woodland) occurs within the Study Area.
Amphibian Breeding Habitat (Wetland)	ELC Community Classes SW, MA, FE, BO, OA and SA. Wetland areas >120 m from woodland habitats. Wetlands and pools (including vernal pools) >500 m^2 (about 25 m diameter) supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats. Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. Bullfrogs require permanent water bodies with abundant emergent vegetation.	ELC assessment was used to identify wetland habitat features within the Study Area including those that may support bullfrogs (i.e., natural open aquatic and marsh habitats greater than 1 ha in size).	**No candidate** wildlife habitat for Amphibian Breeding Habitat (Wetland) occurs within the Study Area.
Habitat for Species of Conservation Concern (*Not including Endangered or Threatened Species*)			
Marsh Bird Breeding Habitat	All wetland habitats with shallow water and emergent aquatic vegetation. May include any of the following Community Types: Meadow Marsh (MAM), Shallow Aquatic (SA), Open Bog (BOO), Open Fen (FEO), or for Green Heron: Swamp (SW), Marsh (MA) and Meadow (CUM) Community Types.	ELC assessment was used to identify marshes with shallow water and emergent vegetation that may support marsh breeding birds.	**No candidate** wildlife habitat for Marsh Bird Breeding Habitat occurs within the Study Area.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Woodland Area-sensitive Bird Breeding Habitat	Habitats >30ha where interior forest is present (at least 200 m from the forest edge); typically, >60 years old. These include any of the following Community Types: Forest (FO), Treed Swamp (SW)	ELC surveys and GIS analysis were used to determine whether woodlots that occurred within the Study Area that were >30 ha with interior habitat present (>200 m from edge).	No woodlots exceeded 30 ha in size within the Study Area. **No candidate** wildlife habitat for Woodland Area-sensitive Bird Breeding Habitat occurs within the Study Area.
Open Country Bird Breeding Habitat	Grassland areas > 30 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or hay or livestock pasturing in the last 5 years, in the following Community Type: Meadow (CUM).	ELC surveys and GIS analysis were used to identify grassland communities within the Study Area that may support area-sensitive breeding birds.	No non-agricultural grassland communities >30 ha were identified within the Study Area. **No candidate** wildlife habitat for Open Country Bird Breeding Habitat occurs within the Study Area.
Shrub/Early Successional Bird Breeding Habitat	Oldfield areas succeeding to shrub and thicket habitats >10 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or intensive hay or livestock pasturing in the last 5 years, in the following Community Types: Thickets (CUT), Savannahs (CUS), or Woodlands (CUW).	ELC surveys and GIS analysis were used to identify large CUT, CUS or CUW communities that may support shrub/early successional breeding birds.	Suitable communities were not identified within the Study Area. **No candidate** wildlife habitat for Shrub/Early Successional Bird Breeding Habitat occurs within the Study Area.
Terrestrial Crayfish	Meadow marshes and edges of shallow marshes (no minimum size). Vegetation communities include MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3. Construct burrows in marshes, mudflats, meadows Can be found far from water	ELC assessment was used to identify shallow marsh and meadow marsh communities that occurred within the Study Area.	Suitable vegetation communities were not identified within the Study Area. **No candidate** wildlife habitat for Terrestrial Crayfish occurs within the Study Area.
Special Concern and Rare Wildlife Species (i.e. all special concern and S1-S3 species)			
Birds			
Barn Swallow (*Hirundo rustica*)	Live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. Attracted to open structures that include ledges where they can build their nests (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**No candidate** habitat occurs within the Study Area.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Eastern Wood-Pewee (*Contopus virens*)	Associated with deciduous and mixed forests. Within mature and intermediate age stands it prefers areas with little understory vegetation as well as forest clearings and edges (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**Candidate** habitat is present in the forested communities (FODM7 / SWDM4, TAGM3) in the Study Area.
Wood Thrush (*Hylocichla mustelina*)	Nests mainly in second growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics but may also nest in small forest fragments (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**Candidate** habitat is present in the forested communities (FODM7 / SWDM4, TAGM3) in the Study Area.
Fish			
Silver Lamprey (Great Lakes - Upper St. Lawrence populations)	Silver lampreys require clear water so they can find fish hosts, relatively clean stream beds of sand and organic debris for larvae to live in, and unrestricted migration routes for spawning. Their use of different kinds of habitat throughout their lives (rivers for spawning and early development, and lakes for adults) makes them vulnerable to changes in their environment (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**No candidate** habitat occurs within the Study Area.
Spotted Sucker	Inhabits clear creeks and small to moderate sized rivers with sand, gravel and clay bottoms. Free of silt. Frequently found in turbid habitats in Ontario. Suckers move to rocky riffle areas of streams for breeding (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**No candidate** habitat occurs within the Study Area.
Insects			
American Burying Beetle	Prefers undisturbed deciduous forests. Requirements include soil to dig egg and larvae chambers, carcasses for food and little competition (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**No candidate** habitat occurs within the Study Area.
Monarch (*Danaus plexippus*)	Meadows where milkweed grows, variety of wildflowers for nectar collection (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**Candidate** Butterfly Migratory Stopover SWH has been identified in the Study Area.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Plants			
Common Hop-tree (*Ptelea trifoliata*)	Found along shorelines of nutrient poor sandy soils, sometimes found in thin soils on top of limestone. Thrives in full sun, not tolerant of shade (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**No candidate** habitat occurs within the Study Area.
Swamp Rose-mallow (*Hibiscus moscheutos*)	The Swamp Rose-mallow (Hibiscus moscheutos) is found only in southern Ontario, in the coastal marshes and remnant wetlands of Lakes Erie, St. Clair, and Ontario; in particular those coastal marshes which are protected by a barrier beach; it is occasionally found in open wet woods, thickets and drainage ditches in a few inland areas (COSEWIC 2004).	ELC assessment was used to assess features within the Study Area that may support this species.	**Candidate** habitat is present in the Study Area in the Wilson D&W Drain riparian area.
Reptiles			
Eastern Musk Turtle (*Sternotherus odoratus*)	Eastern Musk Turtles are found in ponds, lakes, marshes and rivers that are generally slow-moving have abundant emergent vegetation and muddy bottoms that they burrow into for winter hibernation. Nesting habitat is variable, but it must be close to the water and exposed to direct sunlight. Nesting females dig shallow excavations in soil, decaying vegetation and rotting wood or lay eggs in muskrat lodges, on the open ground or in rock crevices (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**No candidate** habitat occurs within the Study Area.
Northern Map Turtle (*Graptemys geographica*)	Inhabits rivers and lakeshore basking on emergent rocks and fallen trees through spring and summer. Hibernate on the bottom of deep, slow moving sections of river. Require high-quality water that supports mollusc prey (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**No candidate** habitat occurs within the Study Area.

Appendix C Significant Wildlife Habitat Assessment in the Colchester South Sewage Works Expansion Class EA Natural Heritage Assessment Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Snapping Turtle (*Chelydra serpentina*)	Generally, inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits (SARO 2023).	ELC assessment was used to assess features within the Study Area that may support this species.	**Candidate** habitat is present in the Study Area in the Wilson D&W Drain.
Animal Movement Corridors			
Amphibian Movement Corridor	Corridors may be found in all ecosites associated with water. Determined based on identifying significant amphibian breeding habitat (wetland).	Identified after Amphibian Breeding Habitat - Wetland is confirmed. Movement corridors should be considered when amphibian breeding habitat is confirmed as SWH from Amphibian Breeding Habitat (Wetland).	**No candidate** habitat occurs within the Study Area.

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Appendix D Species at Risk Habitat Assessment

Appendix D: Habitat Potential in the Colchester South Sewage Works Expansion Study Area for Threatened or Endangered Species

Species	Habitat Preference	Potential Presence in the Study Area (Y/N)
PLANTS		
Butternut	Found in a variety of habitats throughout Southern Ontario, including woodlands and hedgerows (Farrar 1995).	**Y – Suitable habitat present in the Study Area.**
BIRDS		
Bank Swallow	The Bank Swallow excavate nests in exposed earth banks along watercourses and lakeshores, roadsides, stockpiles of soil, and the sides of sand and gravel pits. Single nests may occur, although colonies are typical and range from two to several thousand. Adjacent grasslands and watercourses are used for foraging habitat (Cadman et al., 2007).	**N – Suitable habitat is not present in the Study Area.**
Bobolink	Nests primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures (COSEWIC 2010).	**N – Suitable habitat is not present in the Study Area.**
Chimney Swift	Chimney Swift use chimneys for roosting and breeding, as well as walls, rafters, or gables of buildings and, less frequently, natural structures such as hollow trees, tree cavities and cracks in cliffs (Cadman et al., 2007).	**Y – Suitable habitat present in the Study Area.** Breeding presence is unlikely because the species now predominantly roosts in chimneys and is known to only use trees for roost in large areas of mature forest (COSEWIC 2018).
Eastern Meadowlark	Meadows, hayfields and pastures; also, other open habitat types including mown lawn (COSEWIC 2011). Prefers large (~5 ha), low-lying wet grasslands with abundant litter (COSEWIC 2011).	**Y – Suitable habitat present in the Study Area.**
Prothonotary Warbler	This warbler is a habitat specialist, nesting exclusively in tree cavities, usually overhanging open water, found in deciduous swamps and floodplains (Cadman et al., 2007). Breeding populations are highly localized because of extreme habitat specificity and are vulnerable to habitat destruction. Considered endangered in Canada	**N – Suitable habitat is not present in the Study Area.**
Red-headed Woodpecker	Lives near open woodland and woodland edges, often found in parks, golf courses, and cemeteries. Typically, many dead snags, which are used for nesting and perching (SARO 2023).	**Y – Suitable habitat present in the Study Area.**

Appendix D: Habitat Potential in the Colchester South Sewage Works Expansion Study Area for Threatened or Endangered Species

Species	Habitat Preference	Potential Presence in the Study Area (Y/N)
Yellow-Breasted Chat	The Yellow-breasted Chat prefers scrubby, early successional habitat; dense tangles of grape vine and raspberry are features of most breeding sites. Yellow-breasted Chats have been recorded in shrub thickets, woodland edges, hedgerows, regenerating abandoned fields and young coniferous plantations, and in hydro and rail rights-of-way (Cadman et al. 2007).	**Y – Suitable habitat present in the Study Area.**
MAMMALS		
Small-footed Myotis	Small-footed myotis hibernate in caves and abandoned mines in winter, and roost under rocks, in rock outcrops, buildings, under bridges, or in caves, mines, or hollow trees in the spring and summer (MNRF 2017).	**Y – Suitable habitat present in the Study Area.**
Little Brown Myotis	Trees, buildings and bridges for roosting; trees for nesting; caves and mines for hibernation (COSEWIC 2013).	**Y – Suitable habitat present in the Study Area.**
Northern Myotis	Caves provide overwintering habitat (COSEWIC 2013). Rarely uses human-made structures for roosting (COSEWIC 2013).	**Y – Suitable habitat present in the Study Area.**
Tri-colored Bat	Found in a variety of habitats; caves provide overwintering habitat (COSEWIC 2013).	**Y – Suitable habitat present in the Study Area.**
FISH		
Silver Chub	In Ontario, the Silver Chub is only found in the Great Lakes (SARO 2023).	**N – Suitable habitat is not present in the Study Area.**
MOLLUSCS		
Eastern Pondmussel	In Canada, the species is only found in the delta area of Lake St. Clair (in the transition zone between wetlands and open water), in a small tributary of the upper St. Lawrence River, Lyn Creek, coastal wetlands of Lakes Erie and Ontario and several Eastern Ontario inland lakes (COSEWIC 2017). The preferred habitat of the Eastern Pondmussel is sheltered areas of lakes or slow streams in substrates of fine sand and mud at depths up to 4.5 m (COSEWIC 2017).	**N – Suitable habitat is not present in the Study Area.**

Appendix D: Habitat Potential in the Colchester South Sewage Works Expansion Study Area for Threatened or Endangered Species

Species	Habitat Preference	Potential Presence in the Study Area (Y/N)
REPTILES		
Blanding's Turtle	Blanding's Turtles frequent lakes, ponds, and marshes, and prefer shallow water with abundant aquatic vegetation and a soft bottom (MacCulloch, 2002). They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults usually occupy open or partially vegetated sites, whereas juveniles occupy areas with thick aquatic vegetation including sphagnum, water lilies and algae. Nesting occurs in dry conifer or mixed hardwood forests, up to 410 m from any body of water, in loose substrates including sand, organic soil, gravel and cobblestone, nesting may also occur along gravel roadways (COSEWIC 2005).	**N – Suitable habitat is not present in the Study Area.**
Eastern Massasauga (Carolinian)	Occupies tall grass prairies, bogs, marshes, shorelines, forests and alvars. Often bask in open areas such as forest clearings and rock barrens. Forage in lowland habitats; grasslands, wetlands, bogs, and shorelines. Hibernate underground in crevices in the bedrock, tree root cavities and animal burrows where they can get below the frost line but above water table (SARO 2023). Isolated populations persist in suitable habitat in southern Ontario including in the Wainfleet Bog and Ojibway Prairie (SARO 2023).	**N – Occupied habitat is not present in the Study Area based on known current species range in Ontario.**
Eastern Foxsnake	Eastern Foxsnakes of the Carolinian population primarily use un-forested areas, such as old fields, prairies, marshes and dune shorelines. Farm field hedgerows and riparian zones along drainage canals are also used regularly, particularly in areas of intensive agriculture. Brush piles, table rocks, tree stumps, root systems of downed trees, driftwood are also often used for Shelter and basking sites (COSEWIC 2008).	**Y – Suitable habitat present in the Study Area.**

Appendix D: Habitat Potential in the Colchester South Sewage Works Expansion Study Area for Threatened or Endangered Species

Species	Habitat Preference	Potential Presence in the Study Area (Y/N)
Five-lined Skink	The Carolinian population of five-lined skink is reportedly found in four or five small distinct populations in the Carolinian region, namely those of Point Pelee National Park, Rondeau Provincial Park, Pinery Provincial Park, Oxley Poison Sumac Swamp, and, possibly, Walpole Island (COSEWIC 2007). Carolinian populations inhabit the forests around Lakes Erie, St. Clair, and Huron. They primarily inhabit clearings such as stabilized sand dunes, open forest areas, and wetlands where they find shelter, most often under plant debris, such as decomposing tree trunks; they may also use artificial structures including construction materials and wooden boardwalks (COSEWIC 2007).	**N – Suitable habitat is not present in the Study Area.**
Spotted Turtle	Spotted Turtles inhabit unpolluted habitats of slow-moving, shallow waters of ponds, bogs, fens, marshes, vernal pools and sedge meadows. Vegetation structures such as sphagnum moss, sedge tussocks, cattails, water lilies and hydrophilic shrubs, as well as soft-bottom substrates, are important components of aquatic habitats. Hibernation and Breeding grounds of the Spotted Turtle are often communal, and they exhibit high fidelity to these sites. Some populations of spotted turtles will bury themselves under ground and enter a state of dormancy to avoid the heat and aridity of summer. This generally occurs in a terrestrial site and lasts from July to September, when hibernation begins (COSEWIC 2004).	**N – Suitable habitat is not present in the Study Area.**

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APPENDIX E

Stage 1 Archaeological Assessment Report

Stage 1 Archaeological Assessment: South Colchester Sewage Works Expansion

Part of Lot 83, Concession 1, Geographic Township of Colchester, now Town of Essex, Essex County, Ontario

September 22, 2023

Prepared for:
Town of Essex
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Project Information Form Number:
P422-0030-2023

REVISED ORIGINAL REPORT

Executive Summary

Stantec Consulting Ltd. (Stantec) was retained by the Town of Essex (the Town) to conduct a Stage 1 archaeological assessment as part of a Municipal Class Environmental Assessment (EA) as part of the conceptual design to accommodate increasing wastewater servicing demands in the community of Colchester South, i.e., the Colchester South Sewage Works Expansion project (the Project). The study area for the Project comprises approximately 3.4 hectares located in part of Lot 83, Concession 1, Geographic Township of Colchester, now Town of Essex, Essex County, Ontario. The Stage 1 archaeological assessment conducted by Stantec was undertaken in the preliminary planning and design process for the Class EA requirements under the *Ontario Environmental Assessment Act* (Government of Ontario 1990c).

The Stage 1 archaeological assessment was completed under Project Information Form number P422-0030-2023, issued to Darren Kipping, MA, RPA by the Ministry of Citizenship and Multiculturalism (MCM). A property inspection was conducted on March 17, 2023, by Darren Kipping (P422).

The Stage 1 archaeological assessment of the study area for the Project determined that much of the study area, approximately 98.82%, retains archaeological potential. In accordance with Section 1.3.1 and Section 7.7.4 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **Stage 2 archaeological assessment is required for any portion of the Project's anticipated construction activities which impact an area of archaeological potential.**

The remaining portions of the study area, approximately 1.18%, retain low to no archaeological potential due to low and permanently wet areas. In accordance with Section 1.3.2, Section 2.1 Standard 2, and Section 7.74 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **Stage 2 archaeological assessment is not required for any portion of the Project's anticipated construction activities which impact an area of low to no archaeological potential.**

One historical cemetery is documented partially within the study area, and for which the background research, historical documentation, and mapping is insufficient to completely confirm that no burial activity occurred beyond the legal boundaries. The final design and construction footprint for the Project will be determined at a later date. If any invasive ground disturbances are proposed as part of the Project within a minimum of 10 metres of the cemetery's currently understood property boundaries, as allowed by the study area, a Cemetery Investigation Authorization from the BAO will be required.

Full and detailed recommendations are provided in the body of the report.

The MCM is asked to review the results presented and to accept this report into the *Ontario Public Register of Archaeological Reports*.

The Executive Summary highlights key points from the report only; for complete information and findings, the reader should examine the complete report.

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Project Personnel

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1 Project Context

1.1 Development Context

Stantec Consulting Ltd. (Stantec) was retained by the Town of Essex (the Town) to conduct a Stage 1 archaeological assessment as part of a Municipal Class Environmental Assessment (EA) as part of the conceptual design to accommodate increasing wastewater servicing demands in the community of Colchester South, i.e., the Colchester South Sewage Works Expansion project (the Project) (Figure 1). The study area for the Project comprises approximately 3.4 hectares located in part of Lot 83, Concession 1, Geographic Township of Colchester, now Town of Essex, Essex County, Ontario (Figure 2).

The Stage 1 archaeological assessment conducted by Stantec was undertaken in the preliminary planning and design process for the Class EA requirements under the *Ontario Environmental Assessment Act* (Government of Ontario 1990c).

1.1.1 Objectives

In compliance with the provincial standards and guidelines set out in the Ministry of Citizenship and Multiculturalism's (the MCM) 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), the objectives of the Stage 1 archaeological assessment are as follows:

- To provide information about the study area's geography, history, previous archaeological fieldwork, and current land conditions.
- To evaluate the study area's archaeological potential, which will support recommendations for Stage 2 survey for all or parts of the property.
- To recommend appropriate strategies for Stage 2 survey.

To meet these objectives, Stantec archaeologists employed the following research strategies:

- A review of relevant archaeological, historical, and environmental literature pertaining to the study area.
- A review of the land use history, including pertinent historical maps.
- An examination of the MCM's *Ontario Archaeological Sites Database* to determine the presence of registered archaeological sites in and around the study area.
- A query of the MCM's *Ontario Public Register of Archaeological Reports* to identify previous archaeological assessments completed within 50 metres of the study area.
- A property inspection of the study area by a licensed archaeologist.

Permission to enter the study area was provided by the Town.

1.2 Historical Context

"Contact" is typically used as a chronological benchmark when discussing Indigenous archaeology in Canada and describes the contact between Indigenous and European cultures. The precise moment of contact is a constant matter of discussion. Contact in what is now the province of Ontario is broadly assigned to the 16th century (Loewen and Chapdelaine 2016).

1.2.1 Pre-Contact Indigenous Resources

It has been demonstrated that Indigenous people began occupying southern Ontario as the Laurentide glacier receded, as early as 11,000 years ago (Ellis and Ferris 1990:13). Much of what is understood about the lifeways of these Indigenous peoples is derived from archaeological evidence and ethnographic analogy. In Ontario, Indigenous culture prior to the period of contact with European peoples has been distinguished into cultural periods based on observed changes in material culture. These cultural periods are largely based on observed changes to formal lithic tools, and separated into the Early Paleo, Late Paleo, Early Archaic, Middle Archaic, Late Archaic, and Terminal Archaic periods. Following the advent of ceramic technology in the Indigenous archaeological record, cultural periods are separated into the Early Woodland, Middle Woodland, and Late Woodland periods, based primarily on observed changes in formal ceramic decoration. It should be noted that these cultural periods do not necessarily represent specific cultural identities but are a useful paradigm for understanding changes in Indigenous culture through time. The current understanding of Indigenous archaeological culture is summarized in Table 1, based on Ellis and Ferris (1990). The provided time periods are based on the "Common Era" calendar notation system, i.e., Before Common Era (BCE) and Common Era (CE).

Table 1: Generalized Cultural Chronology of the Study Area

Period	Characteristics	Time Period	Comments
Early Paleo	Fluted Projectiles	9000 – 8400 BCE	Spruce parkland, caribou hunters
Late Paleo	Hi-Lo Projectiles	8400 – 8000 BCE	Smaller but more numerous sites
Early Archaic	Kirk and Bifurcate Base Points	8000 – 6000 BCE	Slow population growth
Middle Archaic	Brewerton-like points	6000 – 2500 BCE	Environment similar to present
Late Archaic	Narrow Points	2500 – 1800 BCE	Increasing site size
	Broad Points	1800 – 1500 BCE	Large chipped lithic tools
	Small Points	1500 – 1100 BCE	Introduction of bow hunting
Terminal Archaic	Hind Points	1100 – 950 BCE	Emergence of true cemeteries
Early Woodland	Meadowood Points	950 – 400 BCE	Introduction of pottery
Middle Woodland	Dentate/Pseudo-Scallop Pottery	400 BCE – 500 CE	Increased sedentism
	Princess Point	550 – 900 CE	Introduction of corn
Late Woodland	Early Late Woodland	900 – 1300 CE	Emergence of agricultural villages
	Middle Late Woodland	1300 – 1400 CE	Long longhouses (100+ metres)
	Late Late Woodland	1400 – 1650 CE	Inter-group warfare and displacement

Period	Characteristics	Time Period	Comments
Contact Indigenous	Various Algonkian Groups	1650 – 1875 CE	Early written records and treaties
Late Historic	Euro-Canadian	1796 CE – present	European settlement

Between 9000 and 8000 BCE, Indigenous populations were sustained by hunting, fishing, and foraging and lived a relatively mobile existence across an extensive geographic territory. Despite these wide territories, social ties were maintained between groups. One method of maintaining social ties was through gift exchange, evident through exotic lithic material documented on many sites (Ellis 2013:35-40).

By approximately 8000 BCE, evidence exists and becomes more common for the production of ground-stone tools such as axes, chisels, and adzes. These tools themselves are believed to be indicative specifically of woodworking. This evidence can be extended to indicate an increase in craft production and arguably craft specialization. This latter statement is also supported by evidence, dating to approximately 7000 BCE of ornately carved stone objects which would be laborious to produce and have explicit aesthetic qualities (Ellis 2013:41). This is indirectly indicative of changes in social organization which permitted individuals to devote time and effort to craft specialization. As described above, since approximately 8000 BCE, the Great Lakes basin experienced a low-water phase, with shorelines significantly below modern lake levels (Stewart 2013: Figure 1.1.C). It is presumed that the majority of human settlements would have been focused along these former shorelines. At approximately 6500 BCE the climate had warmed considerably since the recession of the glaciers and the environment had grown more similar to the present day. By approximately 4500 BCE, evidence exists from southern Ontario for the utilization of native copper, i.e., naturally occurring pure copper metal (Ellis 2013:42). The recorded origin of this material along the north shore of Lake Superior indicates the existence of extensive exchange networks across the Great Lakes basin.

At approximately 3500 BCE, the isostatic rebound of the North American plate following the melt of the Laurentide glacier had reached a point which significantly affected the watershed of the Great Lakes basin. Prior to this, the Upper Great Lakes had drained down the Ottawa Valley via the French-Mattawa River valleys. Following this shift in the watershed, the drainage course of the Great Lakes basin had changed to its present course. This also prompted a significant increase in water-level to approximately modern levels (with a brief high-water period); this change in water levels is believed to have occurred catastrophically (Stewart 2013:28-30) (see Section 1.3.1.1 and Figure 15 for further context on glacial and post-glacial lake levels). This change in geography coincides with the earliest evidence for cemeteries (Ellis 2013:46). By 2900 to 2500 BCE, the earliest evidence exists for the construction of fishing weirs (Ellis *et al.* 1990: Figure 4.1; Stevens 2004). Construction of these weirs would have required a large amount of communal labour and are indicative of the continued development of social organization and communal identity. The large-scale procurement of food at a single location also has significant implications for permanence of settlement within the landscape. This period is also marked by further population increase and by 1500 BCE evidence exists for substantial permanent structures (Ellis 2013:45-46).

By approximately 950 BCE, the earliest evidence exists for populations using ceramics. Populations are understood to have continued to seasonally exploit natural resources. This advent of ceramic technology correlated, however, with the intensive exploitation of seed foods such as goosefoot and knotweed as



well as mast such as nuts (Williamson 2013:48). The use of ceramics implies changes in the social organization of food storage as well as in the cooking of food and changes in diet. Fish also continued to be an important facet of the economy at this time. Evidence continues to exist for the expansion of social organization (including hierarchy), group identity, ceremonialism (particularly in burial), interregional exchange throughout the Great Lakes basin and beyond, and craft production (Williamson 2013:48-54).

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

By approximately 550 CE, evidence emergences for the introduction of maize into southern Ontario. This crop would have initially only supplemented Indigenous people's diet and economy (Birch and Williamson 2013:13-14). Maize-based agriculture gradually became more important to societies and by approximately 900 CE permanent communities emerge which are primarily focused on agriculture and the storage of crops, with satellite locations oriented toward the procurement of other resources such as hunting, fishing, and foraging. By approximately 1250 CE, evidence exists for the common cultivation of historic Indigenous cultigens, including maize, beans, squash, sunflower, and tobacco. The extant archaeological record demonstrates many cultural traits similar to historical Indigenous nations (Williamson 2013:55).

1.2.2 Post-Contact Indigenous Resources

The post-Contact Indigenous occupation of southern Ontario was heavily influenced by the dispersal of various Iroquoian-speaking communities by the New York State Iroquois in the mid-17th century and the subsequent arrival of Algonkian speaking groups from northern Ontario at the beginning of the 18th century (Konrad 1981; Schmalz 1991). By 1690, Ojibwa speaking people had begun moving south into the lower Great Lakes basin. The Indigenous economy since the turn of the 18th century focused on fishing and the fur trade, supplemented by agriculture and hunting (Konrad 1981; Rogers 1978). Numerous Indigenous groups and communities are associated with the post-Contact occupation of southern Ontario and the general area of the Project.

At the turn of the 16th century, the region of the study area is documented to have been occupied by the "Western Basin Tradition" archaeological culture (see Section 1.2.1). Following the turn of the 17th century, the region of the study area is understood to have been within the territory of the "Fire Nation", an Algonquian group occupying the western end of Lake Erie. It is argued, however, that the Atawandaron (also called the Neutral by the English, and Neutre by the French) expanded extensively westward, displacing the Fire Nation and occupying the region of modern Chatham-Kent (Lennox and Fitzgerald 1990:418-419). In the winter of 1626-1627, Recollet Father Daillion travelled through the region

of the study area along the north shore of Lake Erie and encountered numerous villages occupied by the Neutral, also called Attikadaron, Atiouandaronk, or Attiwondaronk, who cultivated fields of maize, tobacco, and squash, in addition to hunting and fishing (Coyne 1895). In 1641-1642, the Jesuit missionaries Brebeuf and Chaumonot passed through 28 Neutral villages and gave some of them Christian names, which appear on Sanson's 1656 map of New France (Sanson 1656; Figure 3). Several villages are illustrated north and east of the study area, but the rivers and creeks are not named on the map and their depicted locations are not entirely accurate, and therefore the exact location of the villages identified by Sanson (1656) cannot be determined. Population estimates of the Neutral, compiled by the Jesuits, range from 12,000 to 30,000 people (Coyne 1895:10).

It is debated whether the Fire Nation was descendent from the archaeologically described Western Basin Tradition, or if they migrated into the western part of Lake Erie, displacing a previous Indigenous culture (Murphy and Ferris 1990:193-194). Historians understand that the displaced Fire Nation moved across the St. Clair and Detroit Rivers into what is modern day lower Michigan, and their populations are synonymous with the later Kickapoo, Miami, Potawatomi, Fox, and Sauk (Heidenreich 1990: Figure 15.1). Bkejwanong (Walpole Island) First Nation (WIFN) tradition states that the Three Fires (a political confederacy, constituted of the Pottawatomi, the Ojibwa, and Odawa) have occupied the delta of the St. Clair River and the surrounding region continually (WIFN n.d.) for thousands of years. In 1649, the Seneca and the Mohawk led a campaign into southern Ontario and dispersed the resident nations and the Seneca used the lower Great Lakes basin as a prolific hinterland for beaver hunting (Heidenreich 1978; Trigger 1978:345).

The study area falls within the traditional territory of the WIFN, the Aamjiwnaang (Sarnia) First Nation (Aamjiwnaang First Nation), the Wiiwkwedong and Aazhoodena (Kettle Point and Stony Point) First Nation, the Deshkaan Ziibing Anishnaabeg (Chippewas of the Thames First Nation) (COTTFN), and the Zaaga'iganiniwag (Caldwell First Nation). Some populations of Wyandot (a nation of historically amalgamated Tionontati and Huron-Wendat populations) also had moved to the region of Lake St. Clair at the turn of the 18th century and resided with the Three Fires (Tooker 1978:398).

In Essex County, and specifically in the Windsor region, a splinter group of Odawa settled in the area (Cultural Resource Management Group Limited *et al*. 2005:2-14 to 2-15). Also, the surviving remnants of the Huron and Petun were settling in the Windsor region as the Wyandot, exhibiting continuities with their 16th and 17th century predecessors from the Midland and Blue Mountain regions (Garrad 2014; Steckley 2014). Given the amalgamated nature of the Wyandot people, sometimes one of the contributing Indigenous peoples was recognized over another, hence the Wyandot were known as Huron in the Windsor region (Garrad 2014:16-54). Therefore, the Wyandot settlement in the Windsor region is commonly referred to as the "Huron Village" and related place names survive in Windsor today, such as Huron Church Road (but also note Wyandotte Street).

Despite the dispersal and movement of Indigenous groups throughout southern Ontario during the 17th and 18th centuries, archaeologically they can be characterized by continuity with their pre-Contact Indigenous counterparts. These peoples maintained a Terminal Woodland archaeological culture albeit with some features of European material culture. While there was cultural and social change occurring due to contact with European colonial powers, there was equally a definite persistence of Indigenous

socio-cultural practices since these groups were not so profoundly affected by European contact that they left their former lifeways behind (Ferris 2009).

Under British administration in the 19th century, various Indigenous groups were divided into separate bands. The Anishinaabe included the western Algonquian peoples, among them the Chippewa and the Odawa. Until the 18th century, the central Algonquian-speaking peoples, including the Potawatomi, were located in the Michigan Peninsula (Blackbird 1887). In the middle of the18th century, the Chippewa were located on the south shores of Lake Huron, the east shores of Georgian Bay, and on the west end of Lake Ontario. Indigenous peoples and their communities continue to play a large role in the occupation of the study area and its environs.

Despite the differentiation among these groups in Euro-Canadian sources, there was a considerably different view by Indigenous groups concerning their self-identification during the first few centuries of European contact. These peoples relied upon kinship ties that cut across European notions of nation identity (Bohaker 2006:277-283). Many of the British-imposed nation names such as Chippewa, Ottawa, Potawatomi, or Mississauga artificially separated how self-identified Indigenous peoples' classified themselves; these groups were culturally and socially more alike than contemporary European documentation might indicate (Bohaker 2006:1-8).

Following the American Revolutionary War, Britain focused on the settlement of European immigrants into what became the province of Upper Canada in 1791. To enable widespread settlement, the British government (the Crown) negotiated a series of treaties with Indigenous peoples. Figure 4 provides a map of southwestern Ontario illustrating early treaties and purchases (Government of Canada n.d.). One of the earliest treaties involving lands located near the study area was made on May 19, 1790. Originally identified as the Detroit Treaty, the chiefs of the Odawa, Chippewa, Pottawatomi, and Huron and representatives of the Crown established a vast tract of land "…from the Detroit River easterly to Catfish Creek and south of the river La Tranche [now Thames River] and Chenail Ecarte [now St. Clair River], and contains Essex County except Anderdon Township and Part of West Sandwich; Kent County except Zone Township, and Gores of Camden and Chatham; Elgin County except Bayham Township and parts of South Dorchester and Malahide…[i]n Middlesex County, Deleware and Westminster Township and part of North Dorchester" (Morris 1943:17). Today, this treaty is identified as Treaty Number 2, illustrated by the letter "C" on Figure 5. A plaque, erected by the Historic Sites and Monuments Board of Canada further identifies this treaty as *McKee's Purchase*. A commemorative plaque located in the Blenheim Memorial Park in Blenheim, Ontario reads (Ontario Plaques 2022):

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

Caldwell First Nation were not part of the negotiations or signing of Treaty Number 2 (*Mckee's Purchase*) and, therefore, were not able to secure rights and benefits from the treaty (Caldwell First Nation 2021). Without a treaty, Caldwell First Nation's traditional territory remained in possession of private and

government interests until November 2020, when Caldwell First Nation received land designation from the Crown and established a Reserve for their community (Caldwell First Nation 2021).

In addition to the above, Figure 6 reproduces a map from the *History of the Windsor Border Region* (Lajeunesse 1960) which depicts several Indigenous sites and trails documented in Essex County during the late 18th century. Trail E extends from River Canard and runs north of the study area to just east of Colchester. “Site 6” labeled as a “Village and mound, Daniel Wright farm, Colchester Township” is illustrated adjacent to a creek and northeast of the study area. “Site 7” labeled as “Several mounds, Colchester Township” is also illustrated adjacent to a creek and northwest of the study area (Lajeunesse 1960: xxxix). Both mound locations (i.e., Site 6 and Site 7) are likely associated with mound locations discussed by Allen (2004) and identified as the Martin Burial Mound (AmHr-2), the Alice and Katherine mound (AaHr-09), and the Wright Burial Mounds (AaHr-10). Based on a review of the MCM’s database, the registered mound locations are at least one kilometre east of the study area. See Section 1.3.3 for further details.

The nature of Indigenous settlement size, population distribution, and material culture shifted as European settlers encroached upon Indigenous territory. However, despite this shift, “written accounts of material life and livelihood, the correlation of historically recorded villages to their archaeological manifestations, and the similarities of those sites to more ancient sites have revealed an antiquity to documented cultural expressions that confirms a deep historical continuity to…systems of ideology and thought” (Ferris 2009:114). As a result, Indigenous peoples have left behind archaeological resources throughout the region which show continuity with past peoples, even if they have not been explicitly recorded in Euro-Canadian documentation.

1.2.3 Euro-Canadian Resources

In 1791, the Provinces of Upper Canada and Lower Canada were created from the former Province of Quebec by an act of British Parliament. At this time, Colonel John Graves Simcoe was appointed as the Lieutenant Governor of Upper Canada and was tasked with governing the new province, directing its settlement, and establishing a constitutional government modelled after that of Britain (Petryshyn 1985). In 1792, Simcoe divided Upper Canada into 19 counties consisting of previously-settled lands, new lands opened for settlement, and lands not yet acquired by Crown. These new counties stretched from Essex in the west, to Glengarry in the east.

Essex County was originally part of the of the District of Hesse, and on October 15, 1792, was renamed the Western District (County of Essex 2019). On January 1, 1800, in the *Act for the Better Division of the Province*, the townships of Rochester, Mersea, Gosfield, Maidstone, Sandwich, Marden were created as part of the County of Essex. The townships of Essex County were surveyed by Thomas Smith, Patrick McNiff, and Abraham Iredell (Clarke 2001:60, 70).

Essex County is bounded by Lake St. Clair to the north, the Detroit River to the west, Lake Erie to the south, and Kent County (now Municipality of Chatham-Kent) to the east. It was one of the first counties to be settled in Upper Canada (later, Ontario). The first French settlers arrived in the Detroit-Windsor area in 1701 when the Sieur De Lamothe Cadillac and roughly 100 military and civilian personnel established Fort Pontchartrain on the Detroit side of the river (Fuller 1972:6-8). Detroit was a strategic location,



relatively close to outlets that flowed to the St. Lawrence River in the east and the Gulf of Mexico to the south. The French settlement remained on the Detroit side until 1748 when the Jesuit mission to the Huron (or Wyandot) was established on the south shore near the foot of the present-day Huron Church Road and the Ambassador Bridge. Fort Pontchartrain surrendered to the British in 1760 and remained under British control until 1796, although it was officially a part of the United States from 1783 onwards. During this period, the settlement continued to grow, but remained predominantly French. The area (now in present-day Windsor) across the river from Fort Pontchartrain (later to become Detroit) was called "Petite côte" and served the agricultural needs of the fort (Archives of Ontario 2014). Following the American Revolutionary War, settlers began to settle further east of the Detroit River along the north shore of Lake Erie (Corporation of the County of Essex 1992:2).

Following the American Revolutionary War, settlers loyal to the Crown crossed the Detroit River and were granted lands in Essex County. As most of the land around Amherstburg was taken by military officers, the new settlers moved east, towards Kingsville, burning forests to establish fertile farmlands. Many of these individuals were Hessians, who sided with the British during the American Revolutionary War, and Pennsylvanian Dutch Mennonites who were branded as British supporters and fled America as a result (County of Essex 2019). United Empire Loyalists were some of the first settlers in the Township of Colchester. Captain William Caldwell, a commander in the Butler's Rangers regiment of Loyalists, encouraged fellow veterans to settle with him along the Detroit River. However, they soon realized few lots of land remained available. Instead, they settled on the north shore of Lake Erie in the Township of Colchester (Town of Essex 2017a:6).

In 1787, Thomas Smith conducted an early survey along the north shore of Lake Erie to formalize the lots of the early settlers along Lake Erie. The lots were surveyed in the French tradition and were narrow 200-acre (80.9 hectare) lots along Lake Erie. This method of settlement allowed more settlers to have access to Lake Erie, an essential transportation corridor before the advent of reliable roads (Town of Essex 2017a:7). By 1788, all of the originally surveyed lots in the township were claimed, and a second concession was added. The township had yet to receive an official name and was called the 'Two Connected Townships', in reference to Gosfield Township, another settlement on the north-shore of Lake Erie populated by Loyalists (Town of Essex 2017a:8). Because the shoreline of Lake Erie was already settled when formal surveying occurred, the clergy and crown reserve lots could not be interspersed throughout the survey in the usual manner. Instead, large blocks of land were set aside north of the 4th Concession. This delayed growth of the northern portion of the township until that land was opened for settlement in the 1840s (Town of Essex 2017a:9). A 1794 survey plan of Colchester Township (McNiff 1794) depicts Lot 83, Concession 1 as being owned by Elisha Wilcocks (Figure 7). Interestingly, the survey plan identifies lots 68, 69, and 70 as "reserved burying place", and an "Indigenous encampment" is illustrated along the boundary of lots 55 and 56 (Figure 7). The Indigenous encampment appears to be the same one as illustrated as Site 5 on the Lajeunesse (1960: xxxix) map (see Figure 6). A 1797 survey plan of Colchester Township by Iredell labels Lot 83 as "D Com" (Figure 8).

Road development in the early 19th century helped in the spread of European settlers throughout Essex County. In 1811, Colonel Talbot commissioned Mahlon Burwell to survey the Talbot Road along the north shore of Lake Erie. The construction of the roadway was interrupted with the War of 1812, eventually reaching Essex County in 1818. Lake Erie remained an essential travel corridor for most of the southern

portion of Essex County and by 1817 the first official admiralty survey of Lake Erie was completed by Henry Bayfield (Figure 9). Bayfield's survey (Bayfield 1828) illustrates the numerous structures along the Lake Erie shoreline and highlights the industrial development along the Detroit River with the numerous windmills, to the west of the study area (Figure 9). Similarly, an 1849 hydrographic survey of the west end of Lake Erie by the United States War Department (Macomb and Marner 1849), depicts the agricultural development of the areas along the Lake Erie shoreline and Pelee Island (Figure 10). The point where the town of Colchester is now situated is listed as "Little's Point" on the 1849 survey map (Figure 10).

In 1854, the Great Western Railway began to develop in Essex County, connecting Leamington, Kingsville, Harrow, and Windsor. With the growth of the railway and lumber marker, Kingsville and surrounding villages began to grow (County of Essex 2019). After the *Municipal Corporations Act* of 1850, which provided a means of government for towns and counties, Essex County became a united entity with the Counties of Kent and Lambton. In June 1853, Essex County once again became an independent county. Roads throughout the region were largely improved by the 1860s, allowing for settlement in the interior portions of Essex County. By 1866, Talbot Road was graveled, and a mail coach was operating along the road between Leamington and Windsor (Kingsville Centennial Committee 1952:18). Walling's *Map of Essex County, Ontario* from 1877 (Walling 1877) depicts Colchester and the surrounding township with an established road network and a developed agricultural community (Figure 11). By this time, many of the buildings appear to be constructed adjacent to roads rather than Lake Erie. William Craig is depicted as the landowner for Lot 83, with two structures on the north side of, and adjacent to a concession road (now County Road 50), north of the study area (Figure 11).

In 1867, twin brothers Henry and Alexander Hackett, the children of Captain Francis Hackett, constructed a dock in Colchester and opened the business Hackett and Company, General Dealers. The dock, known as Hackett's Landing, became important in the shipping of grain and lumber. The dock also served as a fuel depot for steamships on Lake Erie requiring wood. H. Belden & Co.'s *Historical Atlas of Essex and Kent County* from 1881 (Beldon & Co. 1881) shows Hackett's Landing and depicts Lot 83 as still being owned by William Craig with at least one structure on the north side of what is now County Road 50 (Figure 12). The 1881 map also shows three churches within the village (Belden & Co. 1881:21). By the end of the 19th century, lake ice had destroyed the dock and Hackett brothers never rebuilt (Town of Essex 2017a:56).

By the 1870s, Colchester had developed into a village of 200 inhabitants and had a post office, telegraph office, two doctors, a blacksmith, shoemaker, and two carpenters (Morrison 1954:95). In 1880, the Township of Colchester was divided into North Colchester and South Colchester. The township was divided at the line between the sixth and seventh concessions. The southern portion of the township, which contained Colchester Village, was more populated and was constantly outvoting the residents in the northern part of the township (Belden & Co. 1881:11). The province recognized the change is settlement patterns and the need for fair representation within Colchester Township (Belden & Co. 1881:11). Between 1887 and 1889 the Lake Erie, Essex and Detroit River Railway and the Michigan Central Railway reached into the agricultural lands of the county. The arrival of rail transportation marked the decline of the importance of the shipping business in coastal villages like Colchester (Morrison 1954:8).

A United States Army Corps of Engineers chart of Lake Erie from 1924 illustrates the study area remaining as agricultural land and highlights the significant agricultural development surrounding the study area (Figure 13).

In discussing the late 19th century historical mapping, it must be remembered that many historical county atlases were produced primarily to identify factories, offices, residences, and landholdings of subscribers and were funded by subscription fees. Landowners who did not subscribe were not always listed on the maps (Caston 1997:100). As such, structures were not necessarily depicted or placed accurately (Gentilcore and Head 1984). Review of historical mapping also has inherent accuracy difficulties due to potential error in geo-referencing. Geo-referencing is conducted by assigning spatial coordinates to fixed locations and using these points to spatially reference the remainder of the map. Due to changes in 'fixed' locations over time (e.g., road intersections, road alignments, shorelines, etc.), errors/difficulties of scale and the relative idealism of historical cartography, historical maps may not translate accurately into real space points. This may provide obvious inconsistencies during historical map review.

1.2.3.1 Hutchins Cemetery

The Hutchins Cemetery is an early pioneer family cemetery in the northeastern portion of the study area. Although the cemetery is officially registered on Lot 84, Concession 1, a large portion of the cemetery appears to be within Lot 83, Concession 1. The Hutchins family was one of the original pioneer families in the area and the associated family cemetery is the burial place of a War of 1812 veteran and the cemetery was active for approximately 50 years. One of the most significant physical features of the cemetery is the white marble headstones, one of which is double-sided (see Photos 1 and 2 in Section 7.1 of this report). The Town of Essex designated the cemetery to be of cultural heritage value or interest under the provisions of the *Ontario Heritage Act* in 2010 (Town of Essex 2017b). The cemetery was designated based on several heritage attributes, most notably the white marble headstones, the cemetery being in its original location, and the burial place of early pioneers and the War of 1812 veterans (Town of Essex 2010). The cemetery is operated by the Town of Essex. Both the Town of Essex and the Bereavement Authority of Ontario (BAO) were contacted to request historical mapping or legal surveys that confirmed the boundaries of the cemetery. Both the Town and the BAO responded that they did not have any such mapping (see Supplementary Documentation).

1.3 Archaeological Context

1.3.1 Natural Environment

The study area for the Project is situated within the St. Clair Clay Plain. The St. Clair Clay Plain physiographic region is described as:

> *Adjoining Lake St. Clair in Essex and Kent Counties and the St. Clair River in Lambton County are extensive clay plains covering 2,270 square miles. The region is one of little relief, lying between 575 and 700 feet a.s.l., except for the moraine at Ridgetown and Blenheim which rises 50 to 100 feet higher. …Glacial Lake Whittlesey, which deeply covered all of these lands, and Lake Warren which subsequently covered nearly the whole area, failed to leave deep stratified*

> *beds of sediment on the underlying clay till except around Chatham, between Blenheim and the Rondeau marshes, and in a few other smaller areas. Most of Lambton and Essex Counties, therefore, are essentially till plains smoothed by shallow deposits of lacustrine clay which settled in the depressions while the knolls were being lowered by wave action.*
>
> (Chapman and Putnam 1984:147)

The dominant soil type is Perth clay loam, a smooth to undulating topography overtop dark grey-brown clay loam (Richards *et al.* 1949). Perth clay loam has fair to poor drainage and is suitable for cash crops like corn and tobacco. Maize was the most important subsistence crop for pre-Contact Indigenous agriculture. Soil variability can account for significant difference in bushel yield per acre for corn agriculture (Government of Ontario 2022). The ideal soil texture and drainage for corn cultivation is well-drained silt. Despite this, Perth clay loam may have been suitable for Indigenous maize cultivation.

To highlight the topography of the study area, Figure 14 illustrates a hillshade relief map of the surrounding region. The hillshade relief map was developed using Ontario's Light Detection and Ranging (LiDAR) Digital Terrain Model (DTM) which comprises a 50-centimetre resolution dataset representing bare-earth terrain developed from a LiDAR point cloud (Government of Ontario 2017). The Ontario LiDAR DTM was overlaid on the study area and rendered using a hillshade relief with a vertical exaggeration of five metres (based on a z factor of five) to enhance slope and changes in topography. Figure 14 highlights the relatively low-lying topography for portions of the area, mainly related to the unnamed stream in the northwestern portion of the study area and areas close to the Lake Erie shoreline. The eastern and central portions of the study area appear to be slightly elevated topography in relation to the lower areas.

The closest potable water source is an unnamed stream which runs east to west through the northern portion of the study area before turning south and emptying into Lake Erie, which is approximately 150 metres south of the study area. The Lake Erie basin is composed of Middle Paleozoic limestone, dolomite, shale and sandstone and is divided into three distinct basins: western, central, and eastern (Herdendorf 2013). The differences in basin topography and depth are a result of the softer shales at the eastern end of the basin being eroded more easily than the more resistant limestone and dolostone at the western end (Herdendorf 2013). The western basin, from Point Pelee to Cedar Point, is the smallest and shallowest with a mostly flat bottom. Topographic relief comes from several bedrock islands and steep sided shoals that form a partial divide between the western and central basins (Herdendorf 2013). The central basin is the largest and is also relatively flat; it is separated from the eastern basin at Long Point by a sand and gravel bar (Herdendorf 2013). The eastern basin is the deepest and bowl shaped and is connected to the central basin via a subsurface glacially deposited ridge with a notch providing water circulation between the two basins (Herdendorf 2013).

The nearshore zone of Lake Erie is defined by uneven topography which quickly steepens within three kilometres of the shorelines. The sudden 'drop-off' consists of exposed bedrock, glaciolacustrine clay and drift deposits, with few post-glacial deposits.

1.3.1.1 Glacial and Post-glacial Water Levels and Paleoenvironments

Lake Erie as the shallowest Great Lake, has experienced a long and complex post-glacial history with major changes in shoreline locations and environment, due to changes in isostatic rebound, discharge changes, and climatic fluctuations. As it has been deglaciated the longest of the Great Lakes, and is the shallowest, water level fluctuations that would be minor in the other deeper Great Lakes provide more significant change in this shallow basin (Herdendorf 2013).

During the Wisconsin Stage of the last glaciation (circa 19000 BCE), the ice sheet extended over the Lake Erie basin south to the Ohio River. As the climate gradually warmed, the glaciers receded in stages, leaving glacial moraines such as the Erieau Ridge (Holcombe *et al.* 2005) east of the study area (Figure 15). By about 12400 BCE, large glacial lakes formed between the moraines and the glaciers. The earliest and highest of these lakes, Glacial Lake Maumee, extended to Fort Wayne, Indiana and drained through the Mississippi River (Figure 15) (Herdendorf 2013).

Between 12400 BCE and 10400 BCE both high and low water glacial lake stages existed in the Lake Erie basin, reaching 70 metres above the modern lake level at its highest point, and dropping to 89 metres below the modern lake level at its lowest. This lowstand phase, referred to as Lake Ypsilanti, occurred around 11400 BCE, and pollen and plant macrofossil evidence indicate a spruce dominated tundra environment which could support large mammals, such as mastodon and shrub-ox (Metcalfe *et al.* 2013). While a glacial re-advance at about 11000 BCE submerged the lake basin, by 10500 BCE the last glaciers retreated, and the lowered elevation due to isostatic depression caused most of the lake to drain through the Niagara River Outlet (Herdendorf 2013).

At approximately 10500 BCE, Early Lake Erie formed as a closed basin that was about 54 metres lower than current lake elevation (Figure 15). The environment during this time would have been treeless and tundra-like, dominated by small shrubs (such as alder and willow) and herbs. By 10000 BCE, spruce increased, as did temperatures, and shrubs decreased (Metcalfe *et al.* 2013). Discharge from Lake Algonquin at 8400 BCE caused the water levels to increase by about 20 metres, however the water levels dropped again shortly after and likely created a stagnant and eutrophic basin (Figure 15) (Herdendorf 2013). The climate started to dry out as well, with lower precipitation and increased evaporation lowering water levels. With the increased dryness, spruce was replaced with pine-dominated forests (Metcalfe *et al.* 2013). While it is unclear as to the extent of warming during this period, isostatic rebound caused the slow rise of the lake by 5500 BCE (Middle Lake Erie on Figure 15), even with reduced precipitation and higher evaporation. The rise is water levels also coincided with the transition from a pine dominated forest to a deciduous forest dominated by oak, maple, and elm, which remained relatively stable (with some deciduous species shifts) until Indigenous and European land clearance practices introduced more grasses (McAndrews 1994). Despite this gradual rise in lake levels, much of the present bed of Lake Erie would have remained exposed for almost 7,000 years (Herdendorf 2013). Pollen studies from cores taken northeast of the study area show a break in sedimentation, with radiocarbon dates indicating the area was subaerially exposed between 10500 BCE and 6000 BCE (Coakley 1989).

At about 3300 BCE, the Nippissing transgression caused water-levels to rise to three metres above modern water levels (Post Nippissing Highstand on Figure 15). Marsh pollen taken from cores in the Rondeau Bay area demonstrate that it was inundated during this time and may have remained so until 1500 BCE (Coakley 1989), when lake levels stabilized to modern water levels (Herdendorf 2013).

1.3.1.2 Geomorphology

During the changes in water-levels as described above, the lake floor and shoreline topography has been modified over the past 10,000 years. The glacial deposits from the ice sheets and glacial lakes would have been eroded and redeposited as beaches, bars, and spits. The finer grained sediments that would have been deposited during higher glacial lake levels and those preferentially eroded from the shoreline are deposited in the deeper parts of the lake basin. In addition, wind-driven lake water currents can sculpt both original and secondary deposits. The present landforms of Lake Erie formed after 1500 BCE when the lake level stabilized to its modern level, however, these landforms are continually modified and can change drastically during violent weather events and anthropogenic activity (Holcombe *et al.* 2005).

1.3.2 Registered Archaeological Sites and Surveys

In Canada, archaeological sites are registered within the Borden system, a national grid system designed by Charles Borden in 1952 (Borden 1952). The grid covers the entire surface area of Canada and is divided into major units containing an area that is two degrees in latitude by four degrees in longitude. Major units are designated by upper case letters. Each major unit is subdivided into 288 basic unit areas, each containing an area of 10 minutes in latitude by 10 minutes in longitude. The width of basic units reduces as one moves north due to the curvature of the earth. In southern Ontario, each basic unit measures approximately 13.5 kilometres east-west by 18.5 kilometres north-south. In northern Ontario, adjacent to Hudson Bay, each basic unit measures approximately 10.2 kilometres east-west by 18.5 kilometres north-south. Basic units are designated by lower case letters. Individual sites are assigned a unique, sequential number as they are registered. These sequential numbers are issued by the MCM who maintain the *Ontario Archaeological Sites Database*. The study area under review is located within Borden Block AaHr.

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

An examination of the *Ontario Archaeological Sites Database* has shown that there are three registered archaeological sites located within a one-kilometre radius of the study area (Government Ontario 2023a). It is interesting to note that two of the three registered archaeological sites are Indigenous earthworks locations. Table 2 provides a summary of the registered archaeological sites within one kilometre of the study area. None of the registered archaeological sites are within 50 metres of the study area.



Table 2: Registered Archaeological Sites within One Kilometre of the Study Area

Borden #	Site Name	Cultural Affiliation	Site Type
AmHr-2	Martin Burial Mound	Indigenous	Earthwork; burial mound
AaHr-10	Wright Burial Mounds	Indigenous	Earthwork; burial mound
AaHr-9	Alice and Katherine	Indigenous; Woodland	Scatter

A query of the *Ontario Public Register of Archaeological Reports* was completed to identify any previous archeological assessment completed within, or adjacent to, the study area. Based on the query, no previous archaeological assessments have been completed within 50 metres of the study area. However, despite not being within 50 metres of the study area, avocational archaeologist William Allen's *2004 Conservation Report for Ontario Under Licence A070* (Allen 2004) visited and documented the two registered earthwork locations and the Indigenous scatter noted above, and as such, a discussion regarding the report is warranted.

In 2004, avocational archaeologist William Allen conducted field research to document (at that time) non-registered, but known archaeological sites across Ontario under Avocational Licence A070. Allen visited and documented 33 archaeological sites, which included 27 new archaeological site registrations and six archaeological site updates (Allen 2004). A portion of the field research was spent in Essex County, where Allen documented the three archaeological sites noted above. The Martin Burial Mound (AmHr-2) and Wright Burial Mound (AaHr-10) sites were previously mentioned by early archaeological surveys in the area by MacDonald and Lee, however their location had not previously been accurately recorded (Lajeunesse 1960; Lee 1951). Using background research and historical maps, Allen noted the location of the Martin Burial Mound (AmHr-2) on the relatively flat agricultural landscape, on which a house and outbuildings had been constructed (Allen 2004). Allen interviewed the landowner who indicated three locations where burials had been previously disturbed. Allen reported the location and current status of the mound to the MCM and a site record form was created. The Martin Burial Mound (AmHr-2) is approximately one kilometre east of the study area.

Allen visited and documented the Wright Burial Mound (AaHr-10) site located in a partial woodlot. A property owner told Allen the site was visited by archaeologists about "25 years ago", however there is no record of an archaeological excavation at this site and, as Allen noted, the site may have been looted by potential pot hunters (Allen 2004). Allen reported the location and current status of the mound to the MCM and a site record form was created. The Wright Burial Mound (AaHr-10) is approximately 1,300 metres north-northeast of the study area. Approximately 150 metres northeast of the Wright Burial Mound (AaHr-10) at the edge of the same woodlot, Allen identified a scatter consisting of decorated and undecorated pottery sherds (Allen 2004). The site was identified as the Alice and Katherine (AaHr-9) site, and the pottery was collected and delivered to the Museum of Ontario Archaeology in London. These artifacts may be associated with the nearby Wright Burial Mound (AaHr-10). The Alice and Katherine (AaHr-9) site was reported to the MCM and a site record form was created. The site is approximately 1,500 metres north-northeast of the study area.

1.4 Existing Conditions

The study area consists of approximately 3.4 hectares of former agricultural field, manicured lawn, a stream, and historical cemetery. The majority of the study area was previously used as agricultural field, however in recent years this area has been replanted as part of naturalization efforts and now consists of juvenile trees and scrubland.

2 Field Methods

Prior to the start of the Stage 1 archaeological assessment, the Town provided preliminary mapping for the Project (i.e., the study area). This mapping was geo-referenced by Stantec's Geographical Information Systems (GIS) team and a digital file (i.e., a shape file) was created of the study area. The digital file of the study area was uploaded to ArcGIS Field Maps powered by ESRI, customized by Stantec for archaeological survey and assessment, for digital data recording in the field. Data was recorded in the field on a handheld mobile device paired with a Trimble R1 Global Navigation Satellite System (GNSS) receiver to an accuracy of less than one metre.

Initial background research compiled information concerning registered and/or potential archaeological resources within the study area. A property inspection was conducted on March 17, 2023, by Darren Kipping (P422) under Project Information Form (PIF) number P422-0030-2023, issued to Darren Kipping, MA, RPA by the MCM. The property inspection involved spot-checking the entirety of the study area to identify the presence or absence of features of archaeological potential in accordance with Section 1.2 of the MCM's *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

During the property inspection on March 17, 2023, the weather was overcast and cool. At no time were field, lighting, or weather conditions detrimental to the identification of features of archaeological potential. The photography from the property inspection is presented in Section 7.1 and confirms that the requirements for a Stage 1 property inspection were met, as per Section 1.2 and Section 7.7.2 Standard 1 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Figure 16 illustrates photo locations from the property inspection of the study area.

Based on the results of the property inspection, approximately 97.94% of the study area consists of former agricultural field, now a naturalized area, and a small portion of manicured lawn. Photos 3 to 7 illustrate typical examples of the naturalized areas and manicured lawn.

Approximately 1.18% of the study area consists of low and permanently wet areas associated with the unnamed stream in the northern portion of the study area (Photo 8).

The remainder of the study area, approximately 0.88%, consists of the cemetery grounds for the historical Hutchins Cemetery. The limits of the cemetery (as depicted on Figure 16) were recorded in the field during the property inspection using the methods as described above and based on the current fencing surrounding the cemetery. As mentioned previously, Photos 1 and 2 illustrate the cemetery.

3 Analysis and Conclusions

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Stantec applied archaeological potential criteria commonly used by the MCM (Government of Ontario 2011) to determine areas of archaeological potential within the region under study. These variables include proximity to previously identified archaeological sites, distance to various types of water sources, soil texture and drainage, glacial geomorphology, elevated topography, and the general topographic variability of the area. However, it is worth noting that extensive land disturbance can eradicate archaeological potential (Government of Ontario 2011).

Potable water is the single most important resource for any extended human occupation or settlement and since water sources in Ontario have remained relatively stable over time, proximity to drinkable water is regarded as a useful index for the evaluation of archaeological site potential. In fact, distance to water is one of the most commonly used variables for predictive modeling of archaeological site locations. Distance to modern or ancient water sources is generally accepted as the most important determinant past human settlement patterns and considered alone, may result in a determination of archaeological potential. However, any combination of two or more other criteria, such as well-drained soils or topographic variability, may also indicate archaeological potential.

As discussed above, distance to water is an essential factor in archaeological potential modeling. When evaluating distance to water it is important to distinguish between water and shoreline, as well as natural and artificial water sources, as these features affect site location and type to varying degrees. The MCM categorizes water sources in the following manner:

- Primary water sources: lakes, rivers, streams, and creeks.
- Secondary water sources: intermittent streams and creeks, springs, marshes, and swamps.
- Past water sources: glacial lake shorelines, relic river or stream channels, cobble beaches, and shorelines of drained lakes or marshes.
- Accessible or inaccessible shorelines: high bluffs, swamp or marshy lake edges, and sandbars stretching into marsh.

As stated in Section 1.3.1, an unnamed stream runs east to west through the northern portion of the study area, emptying into Lake Erie approximately 150 metres southwest of the study area. Ancient and/or relic tributaries of other primary and secondary water sources may have existed but are not identifiable today and are not indicated on historical mapping nor identifiable on the LiDAR hillshade relief map. Soil texture can also be an important determinant of past settlement, usually in combination of other factors such as topography. As stated previously, soils within the study area consist of Perth clay loam and would have been suitable for early agriculture. A review of the *Ontario Archaeological Sites Database* identified three registered Indigenous archaeological sites within one kilometre of the study area, each identified within similar environmental contexts as the study area (Government of Ontario 2023a; Allen 2004). Two of the archaeological sites are associated with Indigenous earthworks/burial mounds. The third archaeological site, a Woodland period surface scatter, could be associated with the nearby mound site. In addition, the study area is in a location noted for Indigenous earthworks as demonstrated through early land and

archaeological surveys. Despite the complex history regarding glacial and post-glacial water levels in Lake Erie and intermittent highstands, the study area would have been above water for much of the post-glacial period.

It should also be noted that the paucity of assessments and registered archaeological sites may be due to the relatively undeveloped landscape surrounding the study area and is not necessarily reflective of an absence of archaeological resources or potential.

Archaeological potential can also be extended to areas of early Euro-Canadian settlement, including places of military or pioneer settlements; early transportation routes; and properties listed on the municipal register or designated under the *Ontario Heritage Act* (Government of Ontario 1990b) or property that local histories or informants have identified with possible historical events, activities, or occupations. Historical mapping demonstrates that the general area around the study area was occupied as early as the mid-to-late 19th century and that much of the established road networks and agricultural settlements from the 19th century are still visible today. In addition, the historical pioneer cemetery (Hutchins Cemetery) with burials dating from the early 19th century is located partially within the study area. There are no registered Euro-Canadian archaeological sites within one kilometre of the study area. However, similar to the few Indigenous sites, the paucity of assessments and registered archaeological sites may be due to the relatively undeveloped landscape surrounding the study area and is not necessarily reflective of an absence of archaeological resources or potential.

In summary, the Stage 1 archaeological assessment of the Project, involving background research and a property inspection, determined that much of the study area, approximately 98.82%, which includes the cemetery grounds, retains archaeological potential. However, the property inspection also indicted that approximately 1.18% of the study area consists of low and permanently wet areas and this area is considered to retain low to no archaeological potential.

The final design and construction footprint for the Project will be determined at a later date. A refinement of archaeological potential specific to the Project's anticipated impacts will be included as part of the Stage 2 archaeological assessment for the Project. The results of the Stage 1 assessment are illustrated on Figure 16.

4 Recommendations

The Stage 1 archaeological assessment of the study area for the Project determined that much of the study area, approximately 98.82%, retains archaeological potential. In accordance with Section 1.3.1 and Section 7.7.4 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **Stage 2 archaeological assessment is required for any portion of the Project's anticipated construction activities which impact an area of archaeological potential (Figure 16).**

The objective of the Stage 2 archaeological assessment is to document archaeological resources within the portions of the study area still retaining archaeological potential and to determine whether these archaeological resources require further assessment. As the majority of the study area comprises woodlot and naturalized areas (planted trees) that are inaccessible for ploughing, the Stage 2 archaeological assessment will be completed by test pit survey as outlined in Section 2.1.2 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The MCM standards require that each test pit be at least 30 centimetres in diameter, excavated to at least five centimetres into sterile subsoil, and have excavated soil screened through six-millimetre hardware cloth to facilitate the recovery of any cultural material that may be present. Prior to backfilling, each test pit will be examined for stratigraphy, cultural features, or evidence of fill.

If the archaeological field team determines any additional lands to be low and permanently wet, steeply sloped, or disturbed during the Stage 2 field work, those areas will not require survey, but will be photographically documented in accordance with Section 2.1 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

It is further recommended that Stage 2 archaeological assessment of the study area for the Project include engagement with interested Indigenous communities. Indigenous engagement practices conducted during the Stage 2 archaeological assessment will be completed in accordance with the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011) and the MCM's draft technical bulletin on *Engaging Aboriginal Communities in Archaeology*.

The remaining portions of the study area, approximately 1.18%, retain low to no archaeological potential due to low and permanently wet areas. In accordance with Section 1.3.2, Section 2.1 Standard 2, and Section 7.74 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **Stage 2 archaeological assessment is not required for any portion of the Project's anticipated construction activities which impact an area of low to no archaeological potential (Figure 16).**

One historical cemetery is documented partially within the study area, and for which the background research, historical documentation, and mapping is insufficient to completely confirm that no burial activity occurred beyond the legal boundaries. As described previously, the final design and construction footprint for the Project will be determined at a later date. In accordance with the *Registrar's Directive: Authorization for Stages 2-4 Archaeological Fieldwork* (BAO 2021), **if any invasive ground disturbances are proposed as part of the Project within 10 metres of the cemetery's currently**



understood property boundaries, as allowed by the study area, further investigation under a Cemetery Investigation Authorization from the BAO will be required (Figure 16). This would include Stage 2 test pit survey of areas with topsoil followed by a Stage 3 cemetery investigation. The Stage 3 cemetery investigation will comprise mechanical topsoil removal using a backhoe or excavator equipped with a flat bladed (ditching) bucket, under the supervision of a licensed archaeologist with stop-work authority to inspect for evidence of extramural burials. In areas where mechanical excavation or other methodology is not viable for the purpose of making a conclusive assessment of deeply buried potential for extramural burials, or may result in negative impacts to potential burials, such as the roots around mature trees, then hand excavation will be carried out in these areas. If hand excavation is not possible, then project-related construction excavations should be monitored by a licensed archaeologist with stop-work authority to inspect for evidence of extramural burials. These methodologies should be employed within a minimum area of 10 metres from the modern cemetery boundary, as allowed by the study area. If any human remains or grave shafts are encountered, all work must cease, and the police and coroner must be notified, and the archaeological licensee should consult with the BAO and MCM. If evidence of extramural burials is identified then further assessment until a minimum distance of 10 metres beyond all identified extramural burials is achieved may be required, as allowed by the study area.

The MCM is asked to review the results presented and to accept this report into the *Ontario Public Register of Archaeological Reports*.

5 Advice on Compliance with Legislation

In accordance with Section 7.5.9 of the MCM's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011), the following standard statements are a required component of archaeological reporting and are provided from the MCM's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011).

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 0.18 (Government of Ontario 1990b). The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Citizenship and Multiculturalism, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

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

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

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

Archaeological sites recommended for further archaeological fieldwork remain subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990b) and may not be altered, or have artifacts removed, except by a person holding an archaeological license.

6 Bibliography and Sources

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7 Images

7.1 Photographs

Photo 1: Hutchins Cemetery, facing northeast



Photo 2: Hutchins Cemetery, facing southwest



Photo 3: Area retaining archaeological potential, woodlot, facing west



Photo 4: Area retaining archaeological potential, naturalized area / former agricultural field, facing south



Photo 5: Area retaining archaeological potential, manicured lawn, facing south



Photo 6: Area retaining archaeological potential, naturalized area / former agricultural field, facing north



Photo 7: Area retaining archaeological potential, naturalized area / former agricultural field, facing southwest

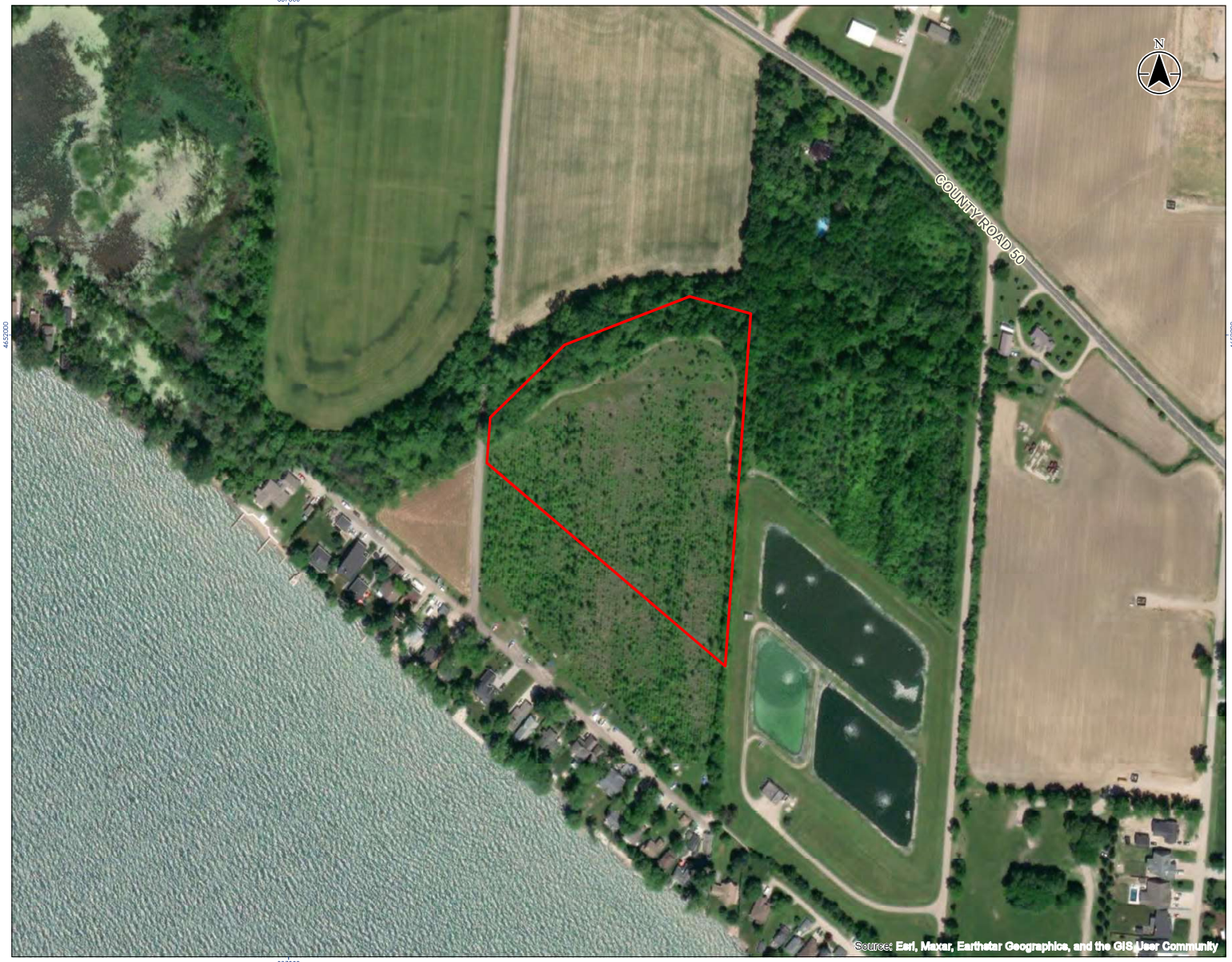


Photo 8: Low and permanently wet area adjacent to unnamed stream, facing west



8 Maps

Maps of the study area for the Stage 1 archaeological assessment follow on succeeding pages.



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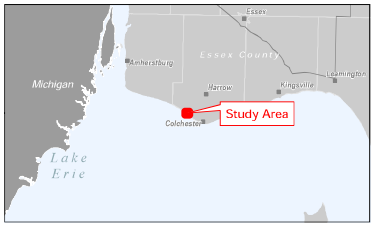
Study Area

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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Source: ESRI,Maxar,Earthstar Geographics,and the GIS User Community



Project Location
Colchester,
Ontario

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Technical Review by DH on 2023-03-20
Independent Review by ABC on yyyy-mm-dd

Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
2

Title
Location of Study Area

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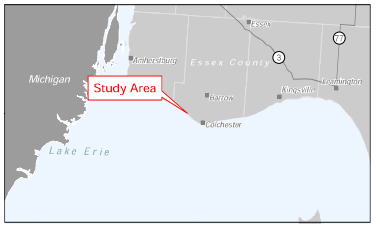


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★ Approximate Study Area

Notes
1. Historic image not to scale.
2. Reference: Sanson, Nicolas. 1656. Le Canada, ou Nouvelle France, &c. Paris: Chez Pierre Mariette.



Project Location
Colchester, Ontario

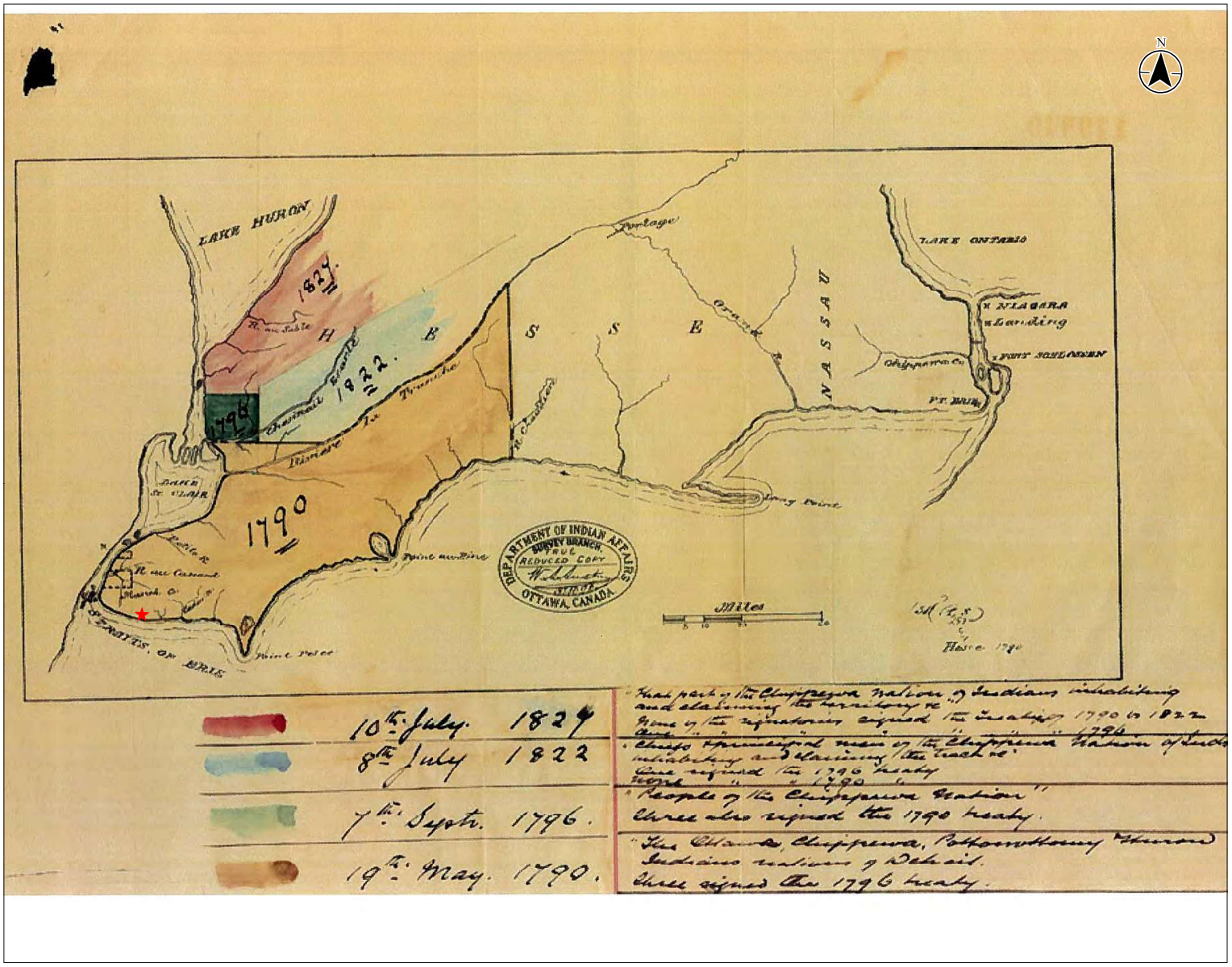
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TOWN OF ESSEX
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STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
3

Title
Portion of the 1656 Sanson Map of New France

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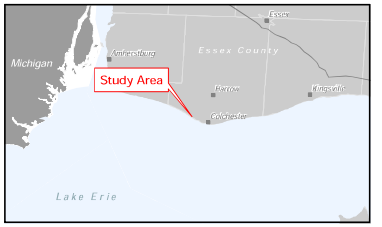


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Legend

★ Approximate Location of Study Area

Notes
1. Historical mapping not to scale.
2. Source: Government of Canada, n.d. *Map of Treaty Areas in Upper Canada*. Ottawa: Department of Indian Affairs, Survey Branch.



Project Location
Colchester, Ontario

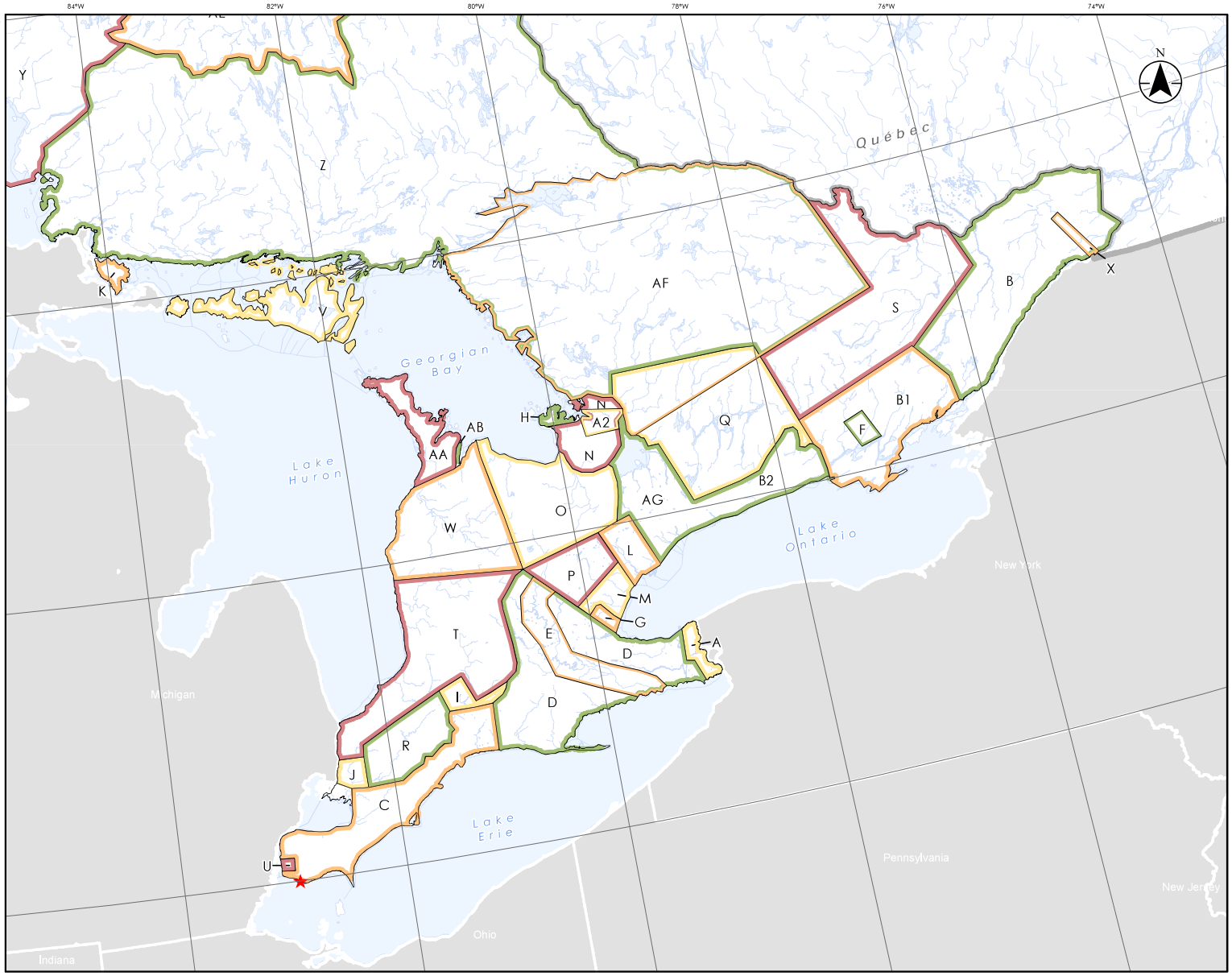
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TOWN OF ESSEX
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STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
4

Title
Map of Treaty Areas in Upper Canada

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Legend

Waterbody

Site Location

- A Treaty No. 381, May 9th, 1781 (Mississauga and Chippewa)
- AA Treaty No. 72, October 30th, 1854 (Chippewa)
- AB Treaty No. 82, February 9th, 1857 (Chippewa)
- AE Treaty No. 9, James Bay 1905, 1906 (Ojibway and Cree)
- AF Williams Treaty, October 31st and November 15th, 1923 (Chippewa and Mississauga)
- AG Williams Treaty, October 31st, 1923 (Chippewa)
- A2 John Collins' Purchase, 1785 (Chippewa)
- B Crawford's Purchase, October 9th, 1783 (Algonquin and Iroquois)
- B1 Crawford's Purchase, October 9th, 1783 (Mississauga)
- B2 Crawford's Purchase, 1783, 1787, 1788 (Mississauga)
- C Treaty No. 2, May 19th, 1790 (Odawa, Chippewa, Pottawatomi, and Huron)
- D Treaty No. 3, December 2nd, 1792 (Mississauga)
- E Haldimand Tract: from the Crown to the Mohawk, 1793
- F Tyendinaga: from the Crown to the Mohawk, 1793
- G Treaty No. 3 3/4: from the Crown to Joseph Brant, October 24th, 1795
- H Treaty No. 5, May 22nd, 1798 (Chippewa)
- I Treaty No. 8, September 7th, 1796 (Chippewa)
- J Treaty No. 7, September 7th, 1796 (Chippewa)
- K Treaty No. 11, June 30th, 1798 (Chippewa)
- L Treaty No. 13, August 1st, 1805 (Mississauga)
- M Treaty No. 13A, August 2nd, 1805 (Mississauga)
- N Treaty No. 16, November 18th, 1815 (Chippewa)
- O Treaty No. 18, October 17th, 1818 (Chippewa)
- P Treaty No. 19, October 28th 1818 (Chippewa)
- Q Treaty No. 20, November 5th, 1818 (Chippewa)
- R Treaty No. 21, March 9th, 1819 (Chippewa)
- S Treaty No. 27, May 31st, 1819 (Mississauga)
- T Treaty No. 27½, April 25th, 1825 (Ojibwa and Chippewa)
- U Treaty No. 35, August 13th, 1833 (Wyandot or Huron)
- V Treaty No. 45, August 9th, 1836 (Chippewa and Odawa, "For All Indians To Reside Thereon")
- W Treaty No. 45½, August 9th, 1836 (Saugeen)
- X Treaty No. 57, June 1st, 1847 (Iroquois of St. Regis)
- Y Treaty No. 60, Robinson, Superior, September 7th, 1850 (Ojibwa)
- Z Treaty No. 61, Robinson, Huron, September 9th, 1850 (Ojibwa)

0 50 100 Km

1:3,000,000 (At original document size of 11x17)

Notes

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

Project Location
Colchester, Ontario

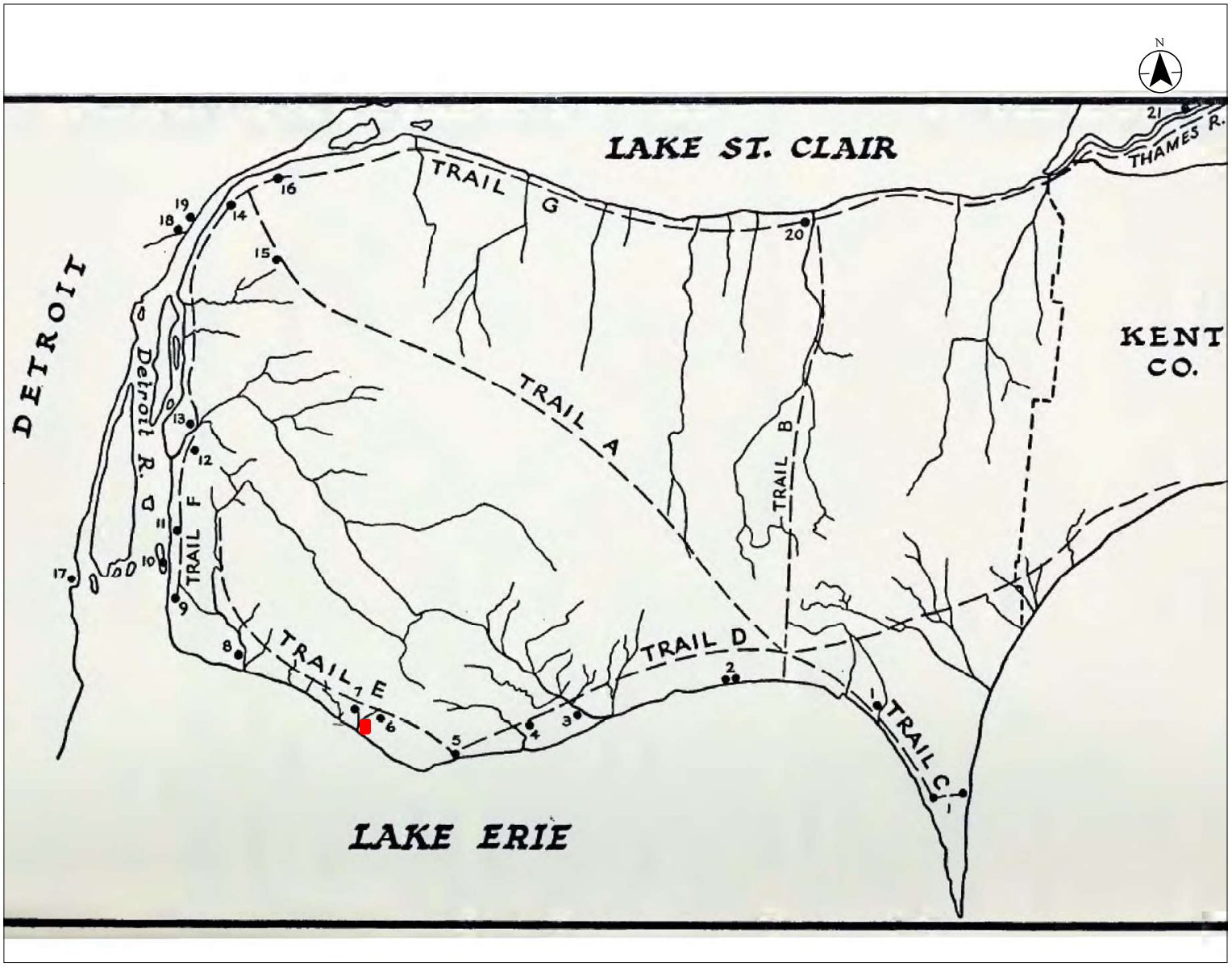
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Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
5

Title
Treaties and Purchases (Adapted from Morris 1943)

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Legend

Approximate Location of Study Area

Indigenous Places Found in Essex County and Vicinity

1. Village, cornfields, and portage, Point Pelee (plan by Iredell 1799).
2. Two Indigenous entrenchments, Gosfield Township (plan by McNiff 1794)
3. Village on Cedar Creek, entrenched, Gosfield Township
4. Village, Colchester, South Township
5. Indigenous encampment, Colchester Township (McNiff 1794)
6. Village and mound, Daniel Wright farm, Colchester Township
7. Several mounds, Colchester Township
8. Village, Big Creek (plan by Iredell 1796)
9. Former village of the Hurons abandoned in 1748
(map by Chaussegros de Léry, fils, 1749)
10. Camping site used by all tribes, Bois Blanc Island
11. Village above Fort Malden (McNiff's map of 1790)
12. Huron village, Anderdon Township (McNiff 1790)
13. Cornfields, Anderdon Township (McNiff 1790)
14. Huron village, Huron Church Line
15. Burial mound, Huron Church Line and Third Concession, Sandwich West Township
(excavated by W.J. Wintemberg for National Museum of Canada 1936)
16. Ottawa village and cemetery, Louis Avenue, Windsor (Chaussegros de Léry 1754)
17. Huron village, Brownstowe, Wayne County, Michigan
18. The great mound at the mouth of the Rouge River, Wayne County, Michigan
19. Circular mound and several smaller mounds at old Fort Wayne
20. Indigenous village, Ruscom River, Rochester Township (plan by Col. Burwell 1823)
21. Chippewa town reported by Major E.B. Littlehales in 1793

Indigenous Trails and Paths

A. Talbot Road, through the county from beyond Wheatley to Sandwich
(shown on McNiff's map of 1791)
B. From Lake Erie to Lake St. Clair, following the Ruscum River (Burwell's map 1823)
C. From Point Pelee to Talbot Road
D. Lake Erie trail connecting shoreline settlements
E. From Lake Erie shoreline to Amherstburg area
F. River shore path, now Highway 18
G. River and lake shoreline to the Thames River and eastward,
followed by Governor Simcoe in 1793

Notes
1. Historical mapping not to scale.
2. Source: Lajeunesse, Ernest J. 1960. *The Windsor Border Region: Canada's Southernmost Frontier*. The Champlain Society, Toronto: University of Toronto Press.

Project Location
Colchester, Ontario

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Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
6

Title
Documented Indigenous Activity in Essex County

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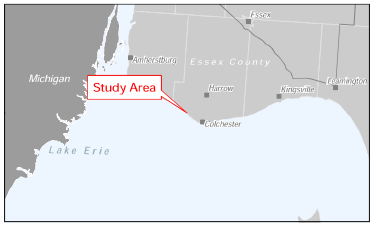


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Legend

Approximate Study Area

Notes
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2. Reference: McNiff, Patrick, 1794. Colchester. 49. Unpublished map, on file with the Ministry of Natural Resources Crown Land Survey Records Office, Peterborough, Ontario. 800 DS.



Project Location
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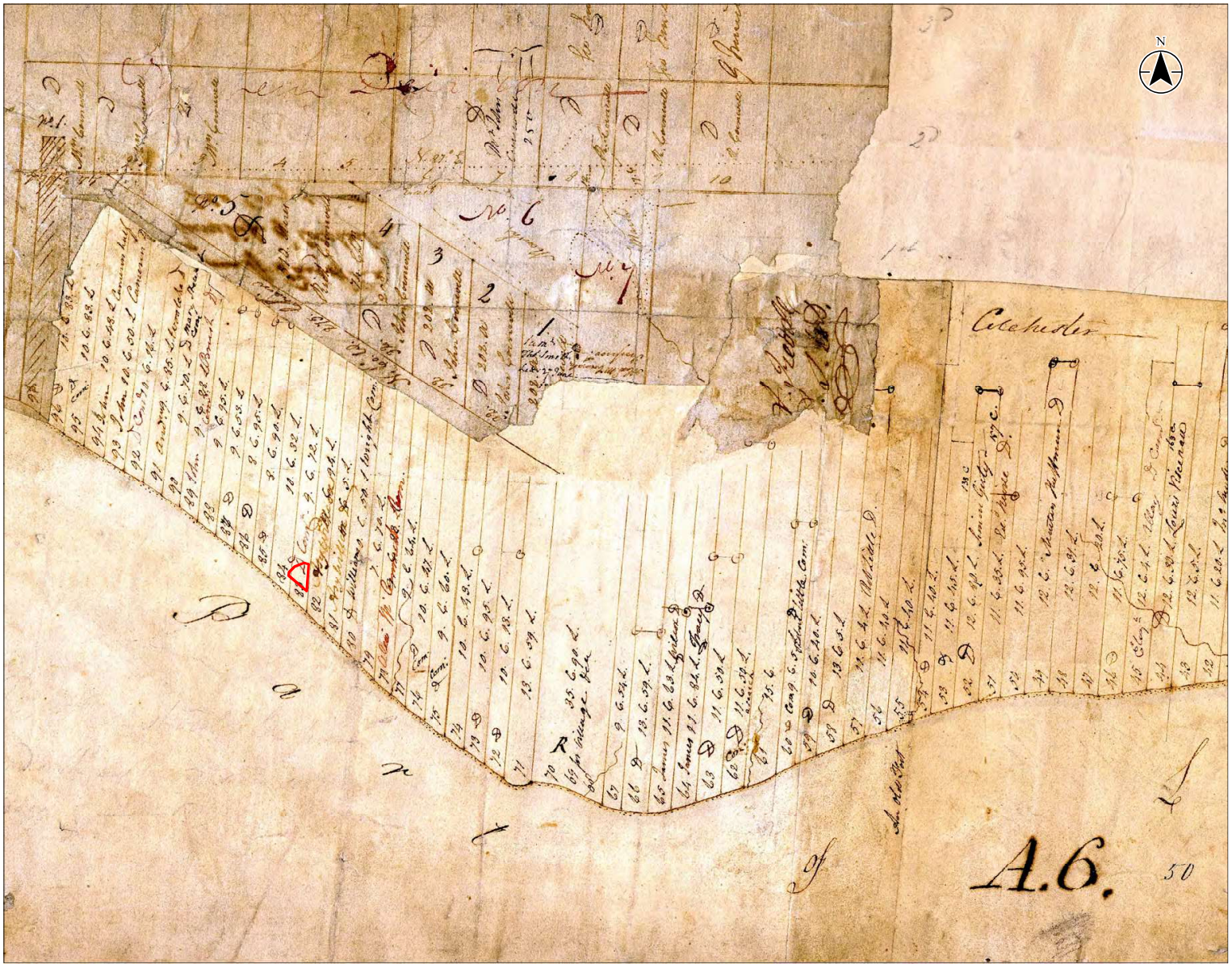
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Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
7

Title
Portion of the 1794 Plan of Colchester Township

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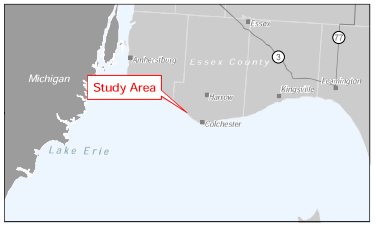


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2. Reference: Iredell, Abraham. 1797. Colchester. A.6. Unpublished map, on file with the Ministry of Natural Resources Crown Land Survey Records Office, Peterborough, Ontario. RG 1-470-0-0-44.



Project Location
Colchester, Ontario

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Prepared by AT on 2023-03-30
Technical Review by DH on 2023-03-20

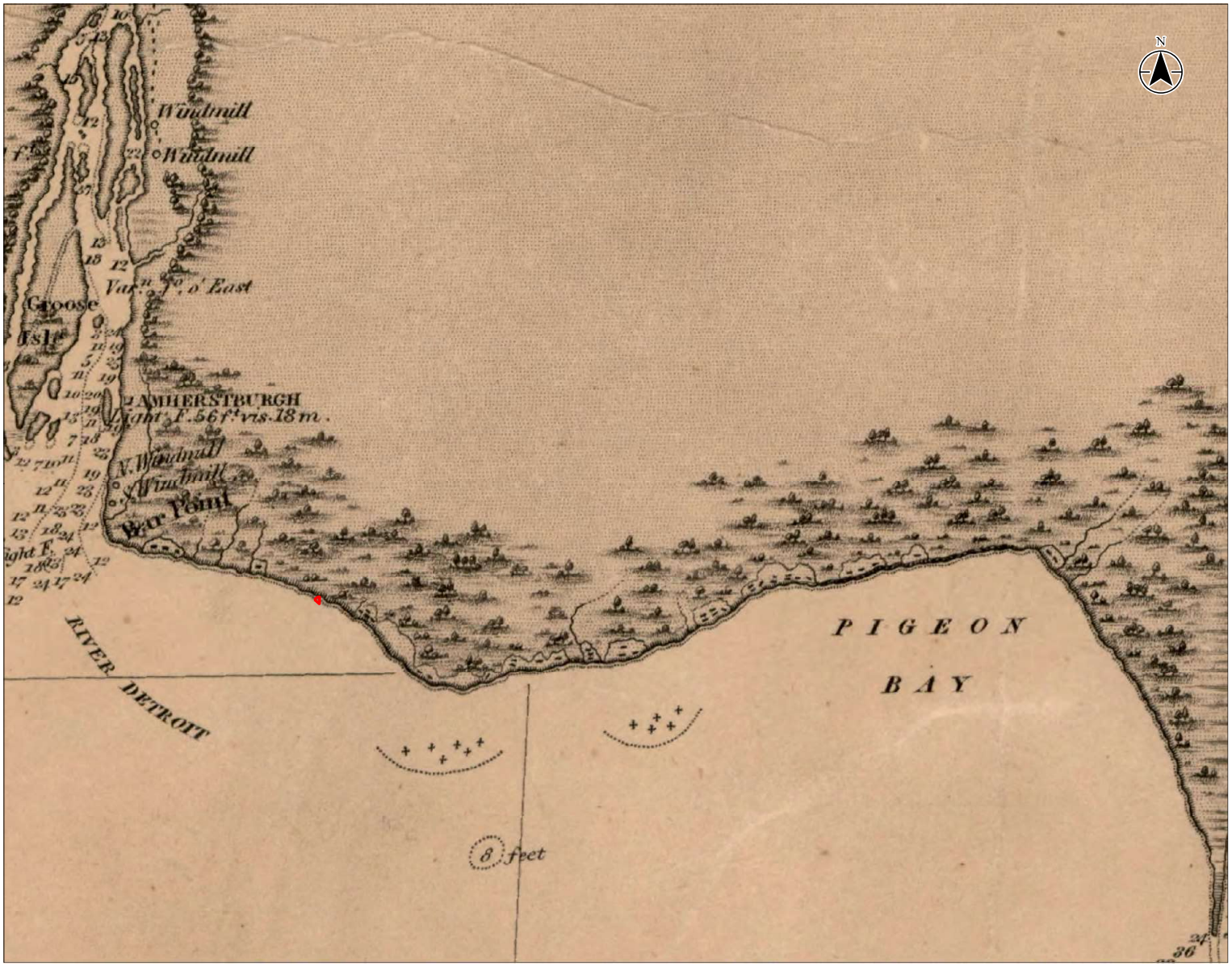
Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
8

Title
Portion of the 1797 Plan of Colchester Township

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Users:abobbas\Virtual Workspaces\Workgroup\165620266\data\gis_cad\gis\mxds\archaeology\layout_figures\Stage1\165620266_S1_Project_Fig08_1797Historic.mxd Revised: 2023-03-30 By: bakaur

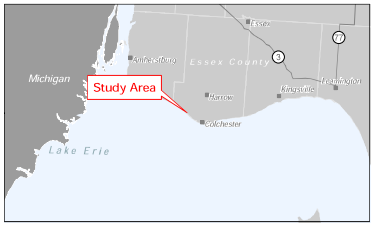


Stantec

Legend

Approximate Study Area

Notes
1. Historic image not to scale.
2. Reference: Bayfield, Henry W. 1828. A Survey of Lake Erie. Great Britain: Admiralty, Hydrographic Office.



Project Location
Colchester, Ontario

165620266
Prepared by AT on 2023-03-30
Technical Review by DH on 2023-03-20

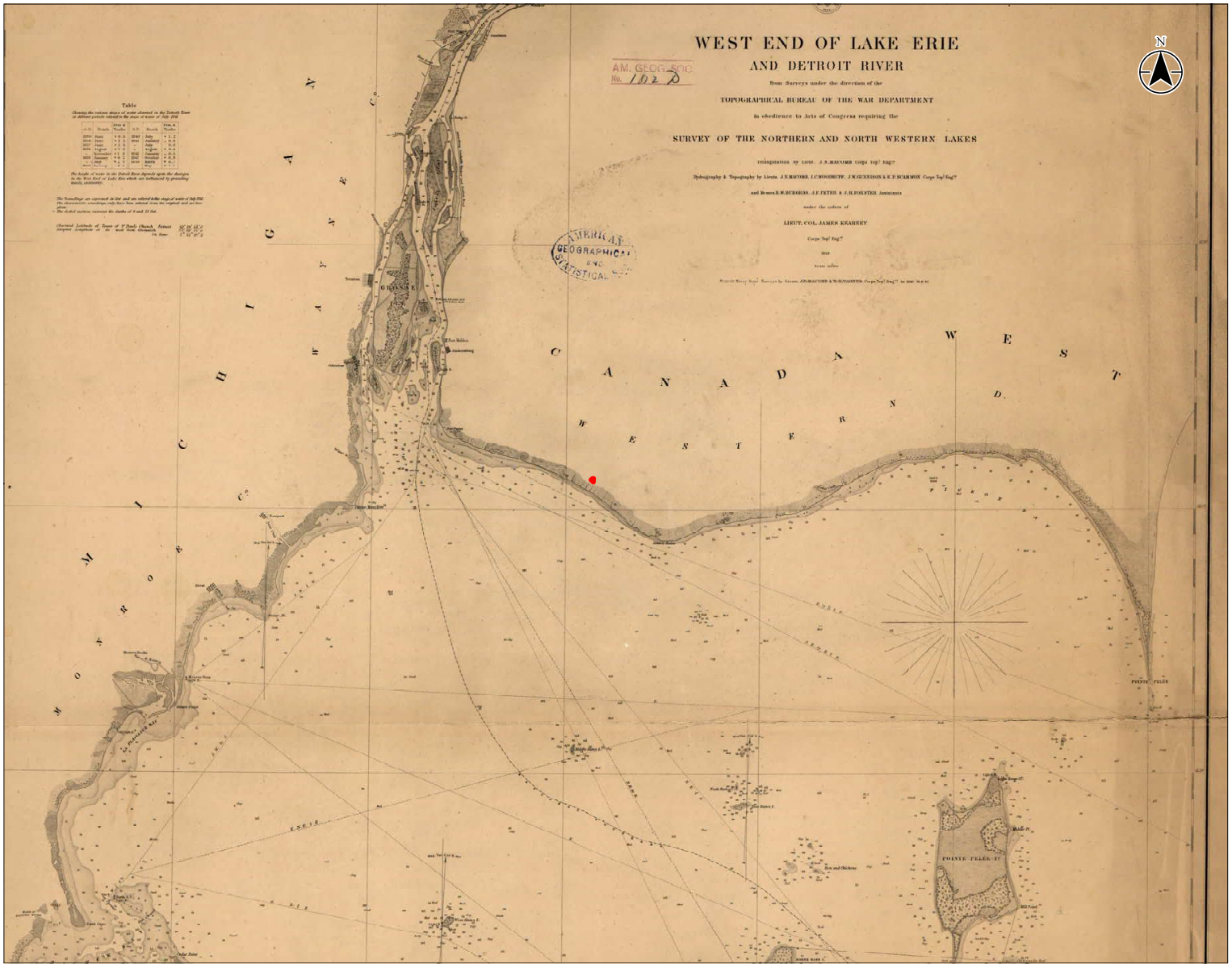
Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
9

Title
Portion of the 1817 Survey of Lake Erie

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Users:adoldan Virtual Workspace:Archaeology:pop1165620266:data:gis_cad:gis:mxd:Archaeology:Report_Figures:Stage1:165620266_S1_Project_Fig09_1817Historic.mxd Revised: 2023-03-30 By: bakaur

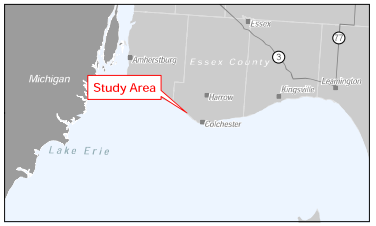


Stantec

Legend

Approximate Study Area

Notes
1. Historic image not to scale.
2. Reference: Macomb, J.N. and W.H. Marner. West End of Lake Erie and Detroit River. United States: Topographical Bureau of the War Department.



Project Location
Colchester, Ontario

165620266
Prepared by AT on 2023-04-13
Technical Review by DH on 2023-03-20

Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
10

Title
Portion of the 1849 Survey of the West End of Lake Erie and Detroit River

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C:\Users\dhollett\Documents\Archaeology\Projects\165620266_Colchester South Sewage Works\Archaeology\Report Figures\Stage1\165620266_Stage1_Fig10_1849Historic.mxd Revised: 2023-04-13 By: dhollett

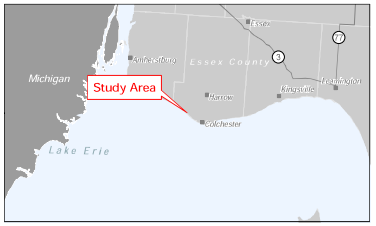


Stantec

Legend

Approximate Study Area

Notes
1. Historic image not to scale.
2. Reference: Walling, H.F. 1877. Map of Essex County, Ontario. R.M. Tackabury.



Project Location
Colchester, Ontario

165620266
Prepared by AT on 2023-03-30
Technical Review by DH on 2023-03-20

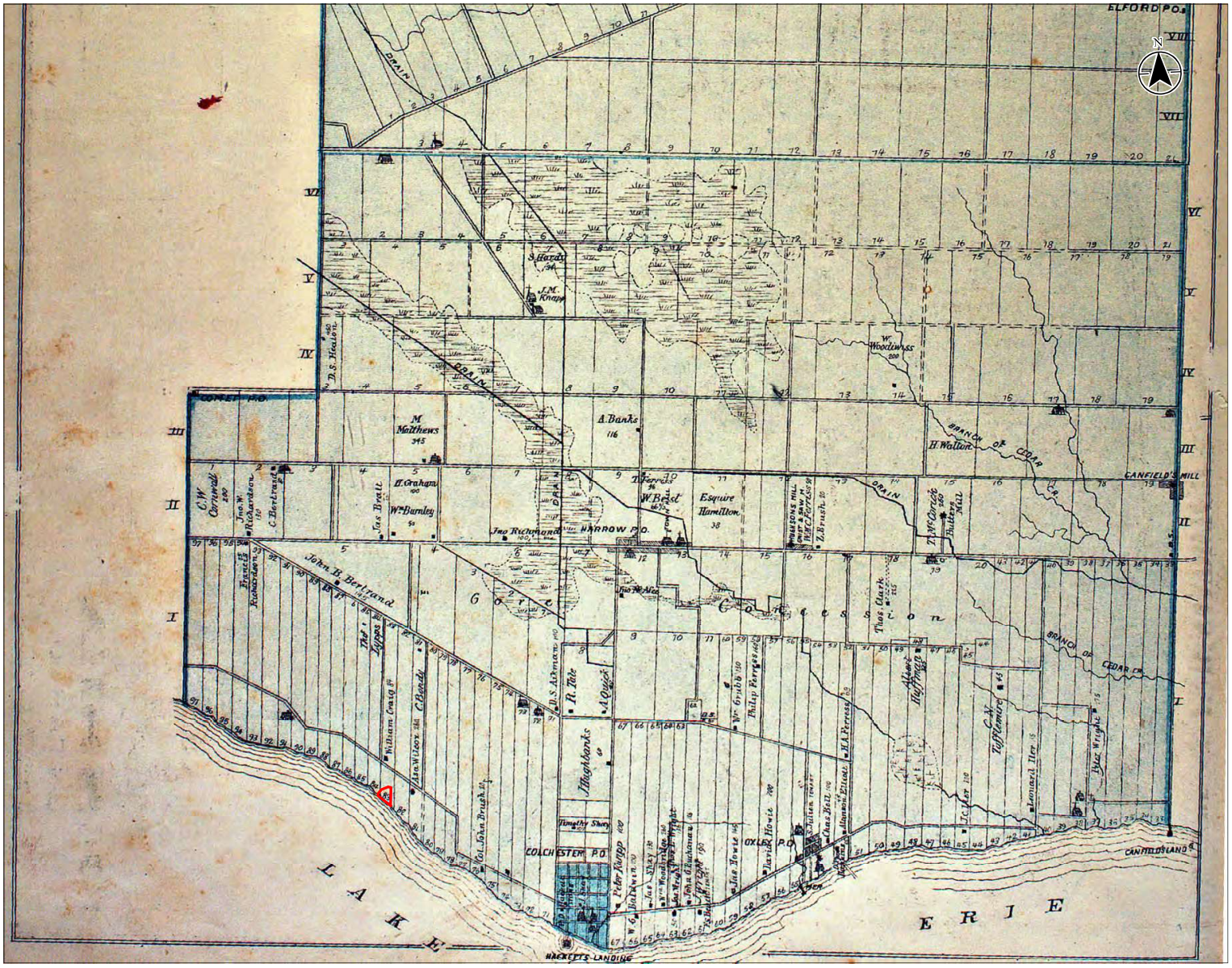
Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
11

Title
Portion of the 1877 Historical Map of Essex County

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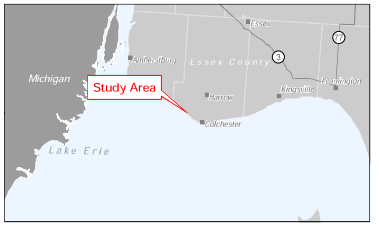


Stantec

Legend

Approximate Study Area

Notes
1. Historic image not to scale.
2. Reference: Belden, H. and Co. 1881. Essex Supplement in Illustrated Historical Atlas of the Dominion of Canada. Toronto: Belden and Co.



Project Location
Colchester, Ontario

165620266
Prepared by AT on 2023-03-30
Technical Review by DH on 2023-03-20

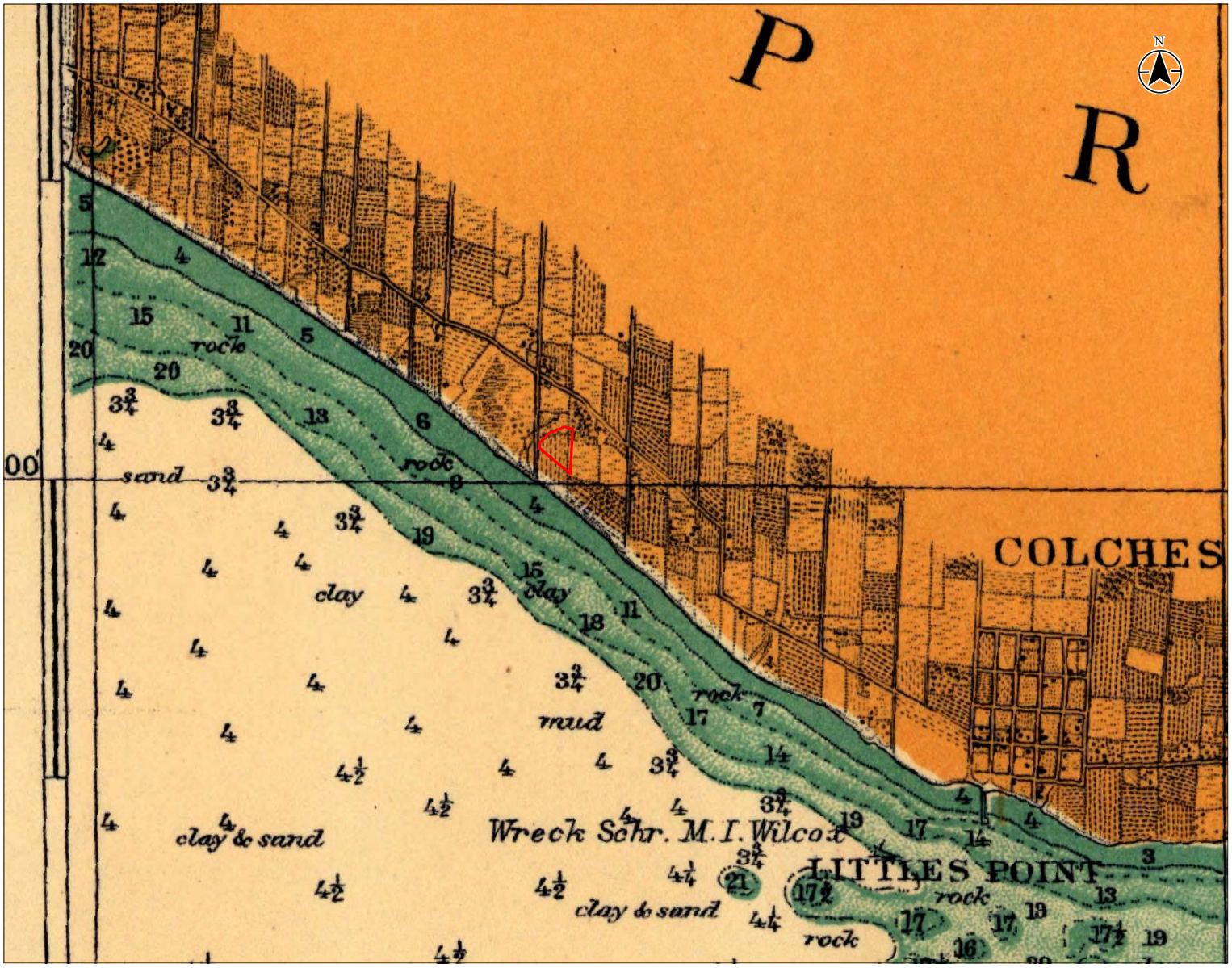
Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
12

Title
Portion of the 1881 Historical Map of Colchester Township

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Users:adoldan\Virtual Workspaces\Archaeology\report\165620266\data\gis_cad\gis\mxds\archaeology\report_figures\Stage1\165620266_Stn Project_Fig12_1881Historic.mxd Revised: 2023-03-30 By: adoldan



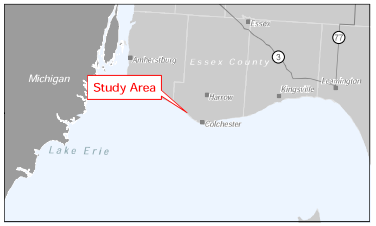
Stantec

Legend

Approximate Study Area

Notes

1. Historic image not to scale.
2. Reference: Comstock, C.B. 1924. Coast Chart No. 6 Lake Erie Vermilion to Port Clinton, Ohio and Point Pelee to Colchester, ONT. Including the Islands. Survey of the Northern and Northwestern Lakes. Washington: Corps of Engineers, U.S. Army.



Project Location
Colchester, Ontario

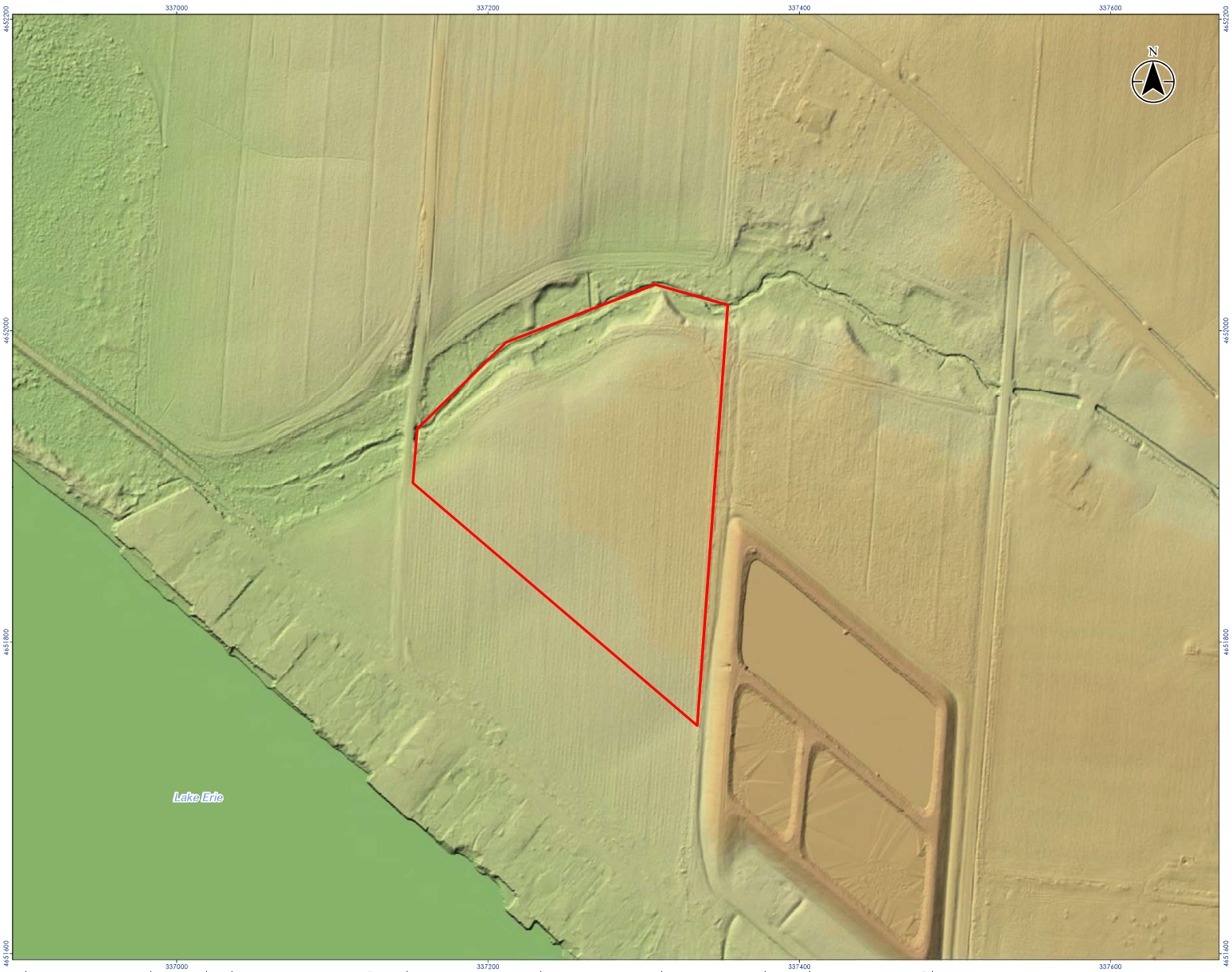
165620266
Prepared by AT on 2023-03-30
Technical Review by DH on 2023-03-20

Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
13

Title
Portion of the 1924 Chart of Lake Erie

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Legend

Study Area

Ground Surface Elevation (m)

High : 186.83

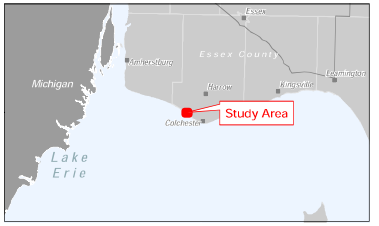
Low : 173.14

0 50 100 Meters

1:2,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Hillshade and dope derived from Ontario LiDAR Digital Terrain Model (2017). Contains information licensed under the Open Government Licence – Ontario.



Project Location
Colchester, Ontario

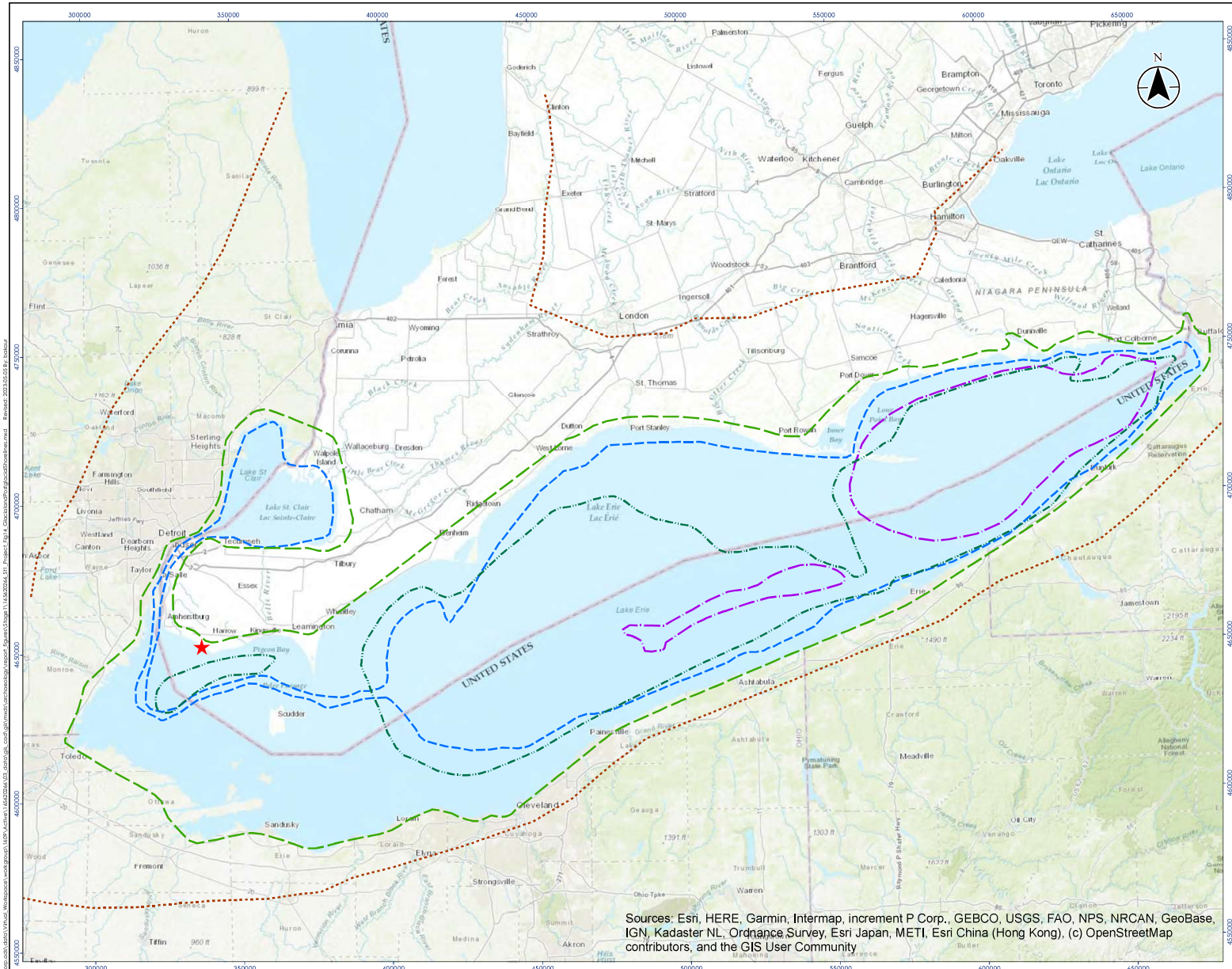
165620266 REVA
Prepared by BK on 2023-03-30
Technical Review by DH on 2023-03-20
Independent Review by ABC on yyyy-mm-dd

Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
14

Title
LiDAR Hillshade Relief Map

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- Study Area
- Glacial Lake Maumee ca. 12,400 BCE
- Early Lake Erie ca. 10,000 BCE
- Early Lake Erie after Lake Algonquin discharge ca. 8400 BCE
- Middle Lake Erie ca. 5500 BCE
- Post Nippising Highstand ca. 2700 BCE

0 30 60 km

1:1,300,000 (At original document size of 11x17)

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



Project Location
Colchester, Ontario

165620266 REVA
Prepared by AT on 2023-05-05
Technical Review by DH on 2023-03-20
Independent Review by ABC on yyyy-mm-dd

Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
15

Title
Glacial and Post-glacial Shorelines of Lake Erie from 14,400 to 4,700 Years Ago

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Legend

- Archaeology Photo Log
- Study Area
- Hutchins Cemetery
- Stage 3 Cemetery Investigation Required

Assessment Method

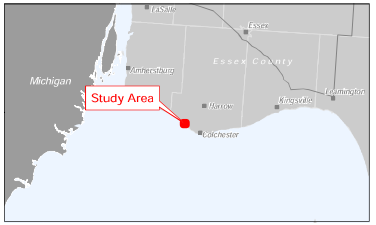
- Area of Archaeological Potential - Further Archaeological Work Required (Stage 2)
- Low and Permanently Wet Area, Low to No Archaeological Potential - No Further Archaeological Work Required

0 50 100 Metres

1:2,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Source: ESRI,Maxar,Earthstar Geographics,and the GIS User Community



Project Location
Colchester, ON

165620266 REVA
Prepared by BF on 2023-03-31

Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
16

Title
Results and Recommendations

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9 Closure

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

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

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

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

Quality Review Dickson, Parker 2023.09.22 15:04:59 -04'00'

Parker Dickson – Senior Archaeologist, Senior Associate

Independent Review Tracie Carmichael 2023.09.22 15:05:56 -04'00'

Tracie Carmichael – Managing Principal, Environmental Services

APPENDIX E

Heritage Overview Memo

Stantec

Memo

To:	Hannah Rindlisbacher Windsor, Ontario	From:	Meaghan Rivard and Lashia Jones London, Ontario
Project/File:	165620266	Date:	August 4, 2023

Reference: Heritage Overview – Colchester South Sewage Works Expansion, Schedule 'C' Municipal Class Environmental Assessment

1 Introduction

Stantec Consulting (Ltd.) Stantec was retained by the Town of Essex to carry out a Schedule C Municipal Class Environment Assessment (EA) for the Colchester South Sewage Works Expansion Class EA. Schedule C projects require the preparation and filing of an Environmental Study Report (ESR) for review by the public and relevant agencies. This Heritage Overview has been completed to identify heritage resources, including built heritage resources and cultural heritage landscapes, present within and adjacent to the Cultural Heritage Study Area (Appendix A, Figure 1).

The purpose of the ESR is to determine the preferred solution and conceptual design to accommodate increasing wastewater servicing demands in the community of Colchester South. The Colchester sanitary sewer system was designed and constructed in the 1980s. A new eco-development is proposed west of the Colchester Urban Centre, which would generate an increase in wastewater servicing demands beyond the capacity of the existing Colchester South Sewer Works. The Colchester South Wastewater Treatment Facility (WWTF) is located on a 12.16 hectare parcel of land approximately 500 metres south of County Road 50 with access off Cornwall Beach Road. A new WWTF is proposed adjacent to the existing facility. The Cultural Heritage Study Area for this Heritage Overview includes a 50 metre buffer around the proposed WWTF.

This heritage overview consists of completion of the Ministry of Citizenship and Multiculturalism (MCM) *Criteria for Evaluating Potential for built Heritage Resources and Cultural Heritage Landscapes Checklist* (the Checklist) and a brief review of potential impacts to previously identified or potential built heritage resources and cultural heritage landscapes. The Checklist identifies protected and potential properties within the Cultural Heritage Study Area and makes recommendations for further work, as appropriate. The Checklist includes consultation with the municipality, relevant agencies, and review of available online materials. Consultation with the Town of Essex, the Ontario Heritage Trust (OHT), and MCM determined that one provincial municipal heritage property, the Hutchins Cemetery, designated under Part IV of the *Ontario Heritage Act* (OHA) (By-Law No. 1059), is within the Cultural Heritage Study Area.

The Checklist was prepared by a full member of the Canadian Association of Heritage Professionals (CAHP) who specializes in the identification of heritage resources and the evaluation of cultural heritage value or interest (CHVI).

2 Methodology

2.1 Regulatory Requirements

The requirement to consider cultural heritage in the EA process is discussed in the Municipal Class EA Document (Municipal Engineers Association 2015). In this process, the cultural environment, including built heritage resources, cultural heritage landscapes, and archaeological resources, is considered as one in a series of environmental factors when undertaking a Municipal Class EA. The identification of cultural heritage resources is particularly important when describing existing and future conditions, assessing development alternatives, and determining the preferred alternative. The Municipal Class EA process recognizes that cultural heritage resources that retain heritage attributes should be identified early in the EA process and avoided where possible. Where avoidance is not possible, potential effects to these attributes should be identified and minimized. Adverse impacts should be mitigated according to provincial and municipal guidelines.

2.2 Municipal Policy Framework

The Town of Essex's Official Plan came into effect in 2009 and was last updated in 2017. Under Section 4.5 of the Official Plan, the Town has Cultural Heritage and Archaeological Resources related policies. Within this section, the Official Plan states:

> "To encourage the restoration, protection and maintenance of the Town's heritage resources, proponents of new development or redevelopment permitted by this Plan shall have regard to heritage resources located on site. The Town will integrate heritage conservation into the planning approval process to facilitate the retention of heritage resources and to ensure compatibility between the proposed new development and the identified heritage resource."
>
> (Town of Essex 2009: 28)

2.3 Municipal and Agency Consultation

Agency consultation was conducted to determine the presence of previously identified protected properties within, or adjacent to, the Cultural Heritage Study Area. Forms of protection range from inclusion on a municipal register or list of potential heritage resources to designation under the OHA or a provincial easement made under the OHA. In order to determine the presence of any of these protected properties, consultation included correspondence with the following:

- MCM
- OHT
- Town of Essex

3 Existing conditions

3.1 Municipal and Agency Consultation

Consultation occurred via email and included mapping of the Cultural Heritage Study Area. At the provincial level, Karla Barboza, Team Lead, Heritage with MCM, responded that there are no properties designated

by the Minister or provincial heritage properties within the Cultural Heritage Study Area. Kevin Baksh, Natural Heritage Coordinator with OHT, confirmed that the OHT does not have any conservation easements or Trust-owned properties within or adjacent to the Cultural Heritage Study Area.

At the municipal level, Rita Jabbour, Manager of Planning Services with the Town of Essex identified one municipal heritage property, the Hutchins Cemetery, designated by the Town in 2013 under Part IV of the OHA (By-Law No. 1059). This cemetery is located within the Cultural Heritage Study Area and is operated by the Town of Essex. Both the Town of Essex and the Bereavement Authority of Ontario (BAO) were contacted regarding a legal survey or mapping of the cemetery boundaries. They both responded that they did not have such mapping. The following is the Statement of Cultural Heritage Value or Interest included in the by-law verbatim (Town of Essex 2013):

Description of the Property:
Hutchins Cemetery

The Hutchins family farm cemetery is located in the Colchester South region within the Town of Essex. This is an active cemetery. It was active for roughly a half century from the mid-nineteenth century until the beginning of the of the twentieth century. The cemetery still occupies the original location as it did during the nineteenth century.

Statement of Cultural Heritage Value or Interest:
Design or Physical Value
The site is comprised of 3 original white marble headstones which denote four burials. The most impressive physical feature of the site is the use of a double sided white marble headstone. This is a very rare feature for the nineteenth century cemeteries in this area and makes this cemetery unique.

Historic/Associative Value
This family cemetery is located on the original land grant which was appointed to William Hutchins in the 19th century. He is one of the original pioneers who settled the Colchester South area.

Contextual Value
This cemetery represents some of the early pioneers who came to Essex County to settle the area. Many people from varying cultures would arrive in the area in hope of more health, wealth and prosperity. The pioneers who lay in this cemetery contributed to the growth of our community. They are a piece of our heritage and its crucial to respect their remains.

Description of Heritage Attributes:
Heritage attributes that contribute to the value of the Hutchins Cemetery:

- Original location of cemetery
- White marble headstones
- One double sided white marble headstone
- Burial place of early pioneers

3.2 Review of Historic Mapping

Late 19th century mapping of the Cultural Heritage Study Area was reviewed to identify the presence of structures, settlements, and other potential resources within or adjacent to the study area. The Cultural Heritage Study Area is situated on Lot 83, Concession 1, in the former Township of Colchester. The 1881 Map of the Township of Colchester was reviewed (Appendix A, Figure 2). The map depicts no structures within or adjacent to the Cultural Heritage Study Area. The closest structure that remains in extant is the William Craig residence located more than 375 metres north of the Cultural Heritage Study Area at 432 County Road 50. In discussing the late 19th century historical mapping, it must be remembered that many

historical county atlases were produced primarily to identify factories, offices, residences, and landholdings of subscribers and were funded by subscription fees. Landowners who did not subscribe were not always listed on the maps (Caston 1997: 100). As such, structures were not necessarily depicted or placed accurately (Gentilcore and Head 1984).

Topographic mapping from the 20th century was also reviewed including 1913, 1920, 1930, 1936, 1940, 1961, and 1975. Some residences along Lake Crest Court and Cornwall Court are depicted on the mid to late 20th century mapping, however these properties are more than 150 metres south of the Cultural Heritage Study Area.

3.3 Site Description



Photo 1: Looking north towards Cultural Heritage Study Area



Photo 2: Looking south within Cultural Heritage Study Area

The Cultural Heritage Study Area consists of a former agricultural field and a woodlot surrounding the Hutchins Cemetery. In recent years the former agricultural field has been replanted as part of naturalization efforts and now consists of juvenile trees and scrubland (Photo 1 and Photo 2). The Hutchins Cemetery is set far back from the roadway within a wooded area (Photo 3 and Photo 4). During the Stage 1 Archaeological Assessment, the cemetery's boundaries were mapped based on the site assessment and above ground features (Appendix A, Figure 3). The burial area is roped off and includes standing and flat gravestone markers.



Photo 3: Hutchins Cemetery, looking northeast



Photo 4: Hutchins Cemetery, looking southwest

3.4 MCM Checklist

The Checklist was completed for the Cultural Heritage Study Area based on the results of the background research, municipal and agency consultation, and review of historic and topographic mapping. Overall, two indicators of cultural heritage value or interest were identified within the Cultural Study Area as they relate to the municipally designated Hutchins Cemetery. The results of the Checklist are summarized in Table 1 and the completed checklist is included in Appendix B.

Table 1 : Indicators of CHVI According to the MCM Checklist

Indicators of Cultural Heritage Value or Interest	Identified within the Cultural Heritage Study Area
Property identified, designated or otherwise protected under the OHA as being of cultural heritage value	**Identified**
A National Historic Site (or part of)	Not Identified
Designated under the *Heritage Railway Stations Protections Act*	Not Identified
Designated under the Heritage *Lighthouse Protection Act*	Not Identified
Identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office	Not Identified
Located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site	Not Identified
Is the subject of a municipal, provincial or federal commemorative or interpretative plaque	Not Identified
Has or is adjacent to a known burial site and/or cemetery	**Identified**
Is in a Canadian Heritage River watershed	Not Identified
Contains buildings or structures that are 40 or more years old	Not Identified
Local or Aboriginal knowledge that the property is considered a landmark in the local community or contains structures or sites that are important in defining the character of the area	Not Identified
Local or Aboriginal knowledge that the property has a special association with a community, person, or historical event	Not Identified

Indicators of Cultural Heritage Value or Interest	Identified within the Cultural Heritage Study Area
Local or Aboriginal knowledge that the property contains or is part of a cultural heritage landscape	Not identified

4 Preliminary Impact Assessment

Based on consultation with the appropriate regulatory bodies and completion of the MCM Checklist, one municipal heritage property, the Hutchins Cemetery, designated by the Town under Part IV of the OHA, was identified within the Cultural Heritage Study Area. As a cemetery, recommendations in this Heritage Overview have been coordinated with the Stage 1 Archaeological Assessment that was completed by Stantec for the EA (Stantec 2023).

A legal survey of the Hutchins Cemetery and its exact boundaries could not be completed during preparation of the Heritage Overview or the Stage 1. Therefore, the absence of burial activities that extend beyond legal boundaries could not be confirmed. Depending on the future proposed locations of the construction footprint or staging areas for the WWTF, there may be potential for impacts to the cemetery. As a result, the following preliminary mitigation measures should be considered when preparing detailed design:

Preferred Option: Avoid the cemetery by establishing a buffer zone around the currently understood boundaries to limit construction activity to more than 50 metres away. This should use appropriate preventive measures such as mapping the cemetery on construction maps and using temporary fencing to denote the cemetery. Staging and laydown areas should also be non-invasive and avoid the cemetery. Where avoidance is not feasible, the alternative option should be applied.

Alternative Option: Should avoidance with a 50m buffer not be feasible, the following alternative option is recommended:

- Complete a property-specific HIA for the Hutchins Cemetery, prior to detailed design and any alterations. The HIA will include a reassessment of the Reasons for Designation contained within *Schedule "B" to Bylaw No. 1059 of the Corporation of the Town of Essex Reasons for Designation – Hutchins* Cemetery and confirm the heritage attributes and boundaries of the cemetery as a protected heritage property. The HIA will include recommendations and specific mitigation measures for impacts to identified heritage attributes.
- The HIA will also consider the compatibility of new structures or landscape features with the cemetery's heritage attributes.
- The HIA shall be submitted to MCM, municipality and other interested parties for review and comment.

5 Recommendations

The final design and the construction footprint for the WWTF should be designed in a manner that avoids potential impacts to the Hutchins Cemetery. This should be done through establishment of a 50 metre buffer surrounding the currently identified boundaries of the cemetery. Detailed designs for the WWTF should be provided to a Cultural Heritage Specialist and Archaeologist for review at 30%, 60%, 90%, and

Reference: Heritage Overview – Colchester South Sewage Works Expansion, Schedule 'C' Municipal Class Environmental Assessment

100% stages to provide feedback, if any, on the potential interactions with the cemetery and advise on the mitigation measures identified above. The location of the cemetery should be mapped on construction maps and temporary fencing should be installed. Staging and laydown areas should be selected to be non-invasive and avoid the cemetery's currently understood property boundaries.

Should the preferred option described above not be feasible and Project work is required within 50 metres of the Hutchins Cemetery, the alternative mitigation option should be applied. This includes preparation of a property specific HIA prior to completion of detailed design. The HIA should confirm the heritage attributes and boundaries identified within the designating by-law in order to review the potential for impacts to the cemetery as a result of the Project. The HIA should consider the compatibility of the Project with identified heritage attributes of the cemetery and include recommendations and mitigation measures where impacts are identified. The HIA shall be submitted to the MCM, municipality, and other interested parties for review and comment.

6 Closure

This memo has been prepared for the sole benefit of the Town of Essex and may not be used by any third party without the express written consent of Stantec Consulting Ltd., and the Town of Essex. We trust this memo meets your current requirements. Please do not hesitate to contact us should you require further information or have additional questions about any facet of this report.

Digitally signed by Meaghan Rivard
Date: 2023.08.04 15:25:00 -04'00'

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Senior Heritage Consultant
Phone: (226) 268-9025
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Digitally signed by Jones, Lashia
Date: 2023.08.04 15:21:30 -04'00'

Lashia Jones MA, CAHP
Senior Cultural Heritage Specialist
Phone: (226) 268-5392
Lashia.jones@stantec.com

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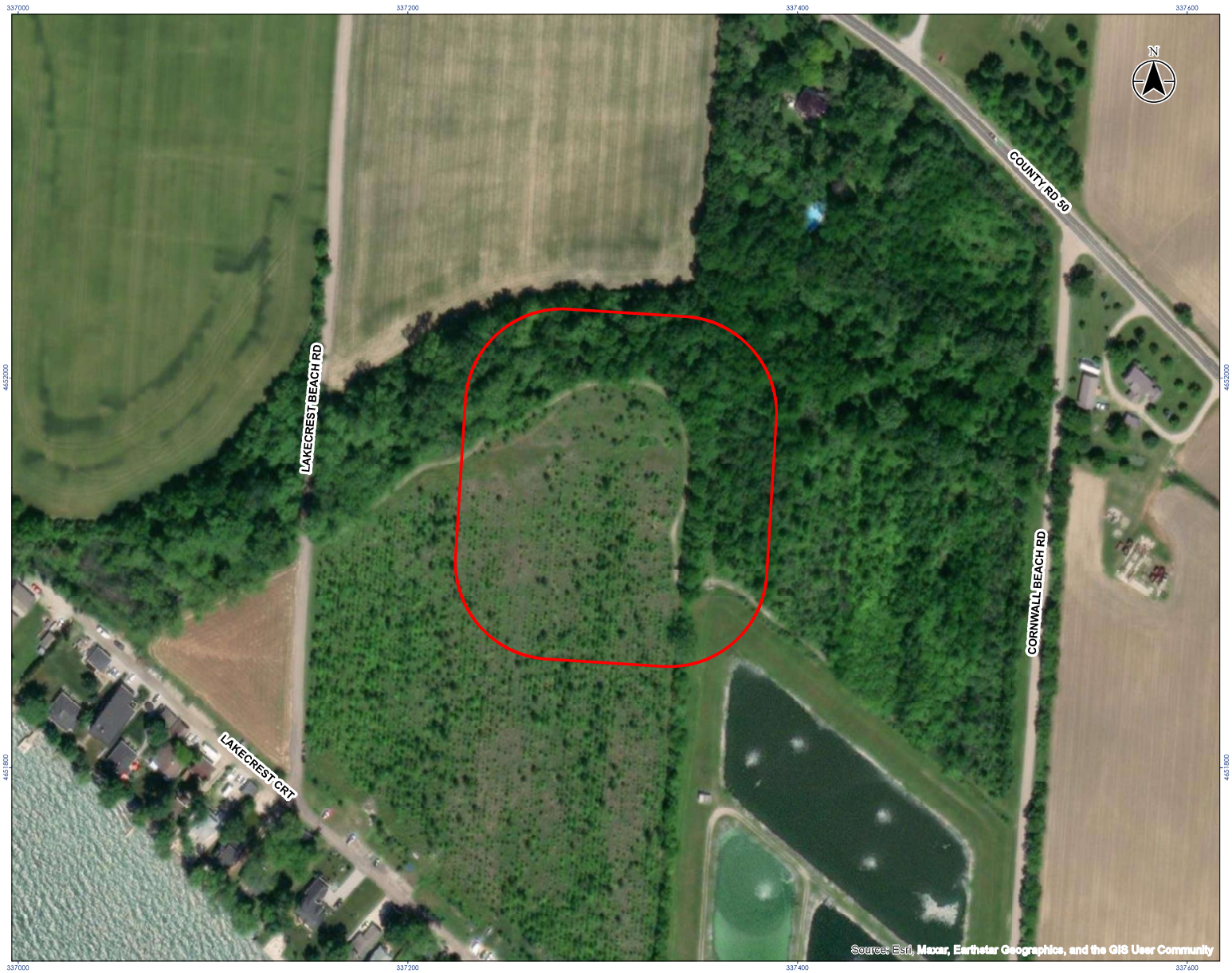
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Reference: **Heritage Overview – Colchester South Sewage Works Expansion, Schedule 'C' Municipal Class Environmental Assessment**

Attachment A Figures



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Legend

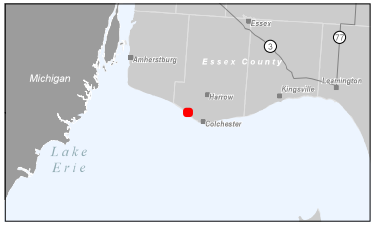
Heritage Overview Study Area

0 50 100 m

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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Source: ESRI,Maxar,Earthstar Geographics,and the GIS User Community



Project Location
Colchester,
Ontario

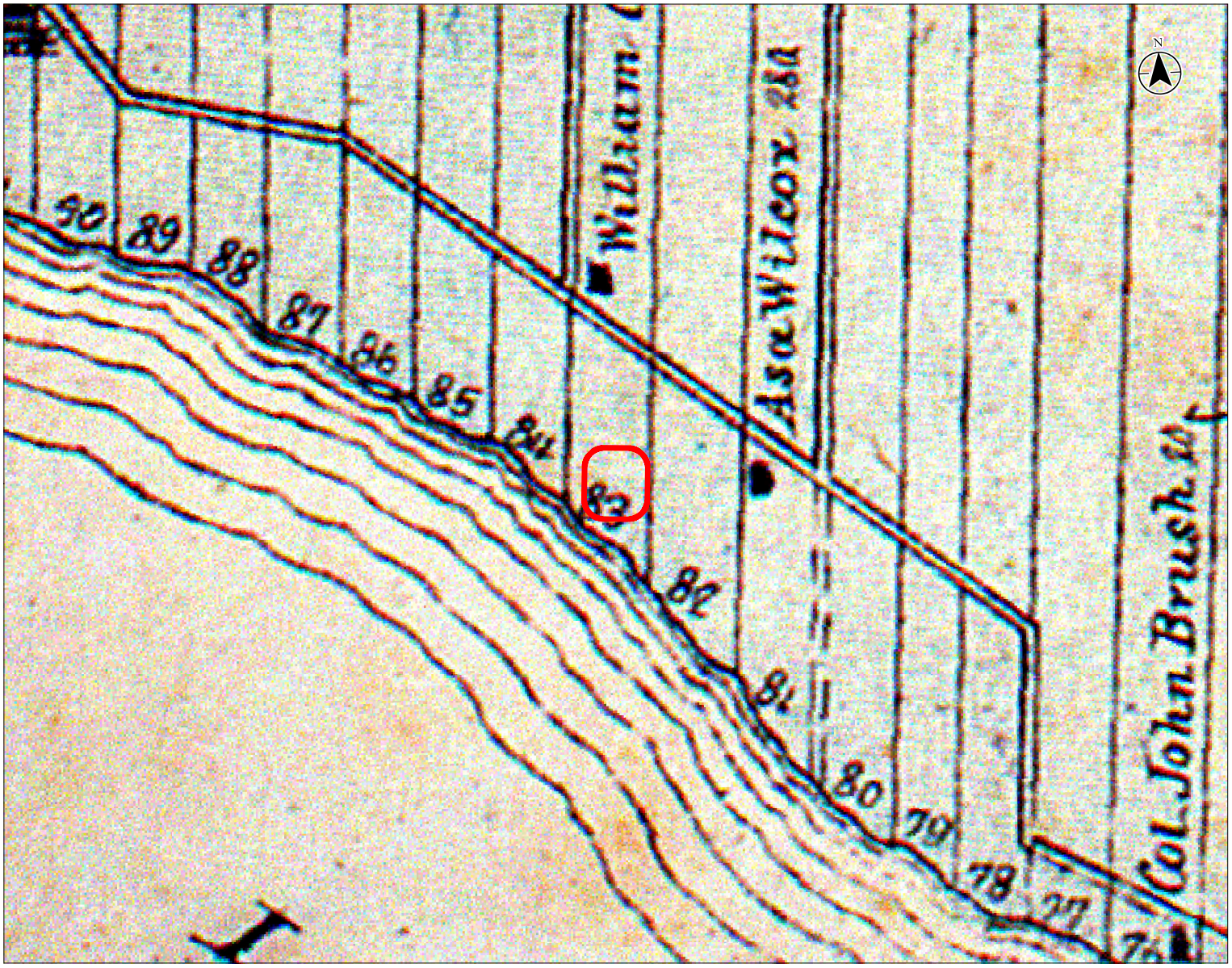
165620266 REVA
Prepared by BF on 2023-06-01

Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
HERITAGE OVERVIEW MEMO

Figure No.
1

Title
Study Area

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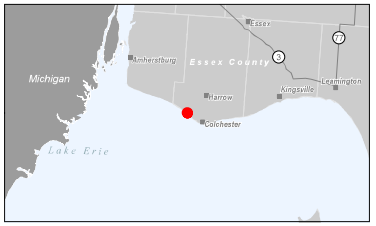
Stantec

Legend

Heritage Overview Study Area

Notes

1. Historic Image not to scale.
2. Reference: Belden, H. and Co. 1881. Essex Supplement in Illustrated Historical Atlas of the Dominion of Canada. Toronto: Belden and Co.



Project Location
Colchester, Ontario

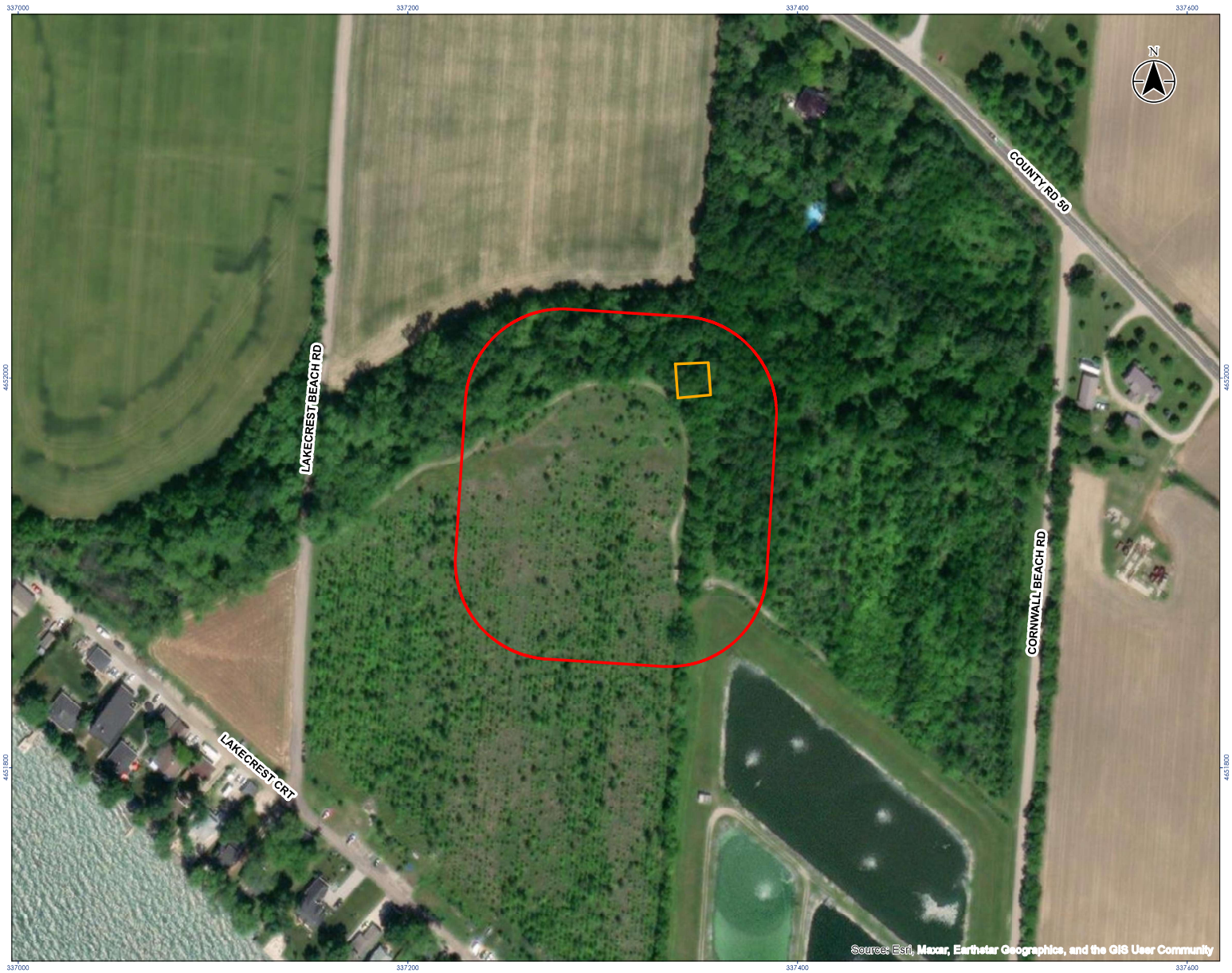
165620266
Prepared by BF on 2023-06-01

Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
HERITAGE OVERVIEW MEMO

Figure No.
2

Title
Township of Colchester, 1881

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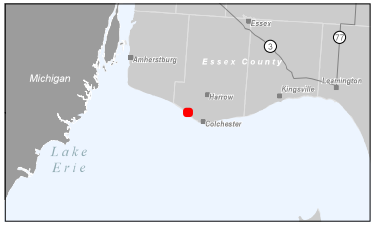
- Heritage Overview Study Area
- Hutchins Cemetery

0 50 100 m

1:2,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Source: ESRI,Maxar,Earthstar Geographics,and the GIS User Community



Project Location
Colchester,
Ontario

165620266 REVA
Prepared by BF on 2023-06-01

Client/Project
TOWN OF ESSEX
COLCHESTER SOUTH SEWAGE WORKS EXPANSION
HERITAGE OVERVIEW MEMO

Figure No.
3

Title
Study Area and Hutchins Cemetery

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Reference: **Heritage Overview – Colchester South Sewage Works Expansion, Schedule 'C' Municipal Class Environmental Assessment**

Attachment B MCM Checklist

Project or Property Name

COLCHESTER SOUTH SEWAGE WORKS EXPANSION

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

Harrow, Town of Essex, Essex County

Proponent Name

Town of Essex

Proponent Contact Information

David McBeth, Manager, Capital Works and Asset Management, dmcbeth@essex.ca

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