April 11, 2023
City Council Meeting
Item 11.2

ST. ROSE STORMWATER PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT – SCHEDULE 'C'

Environmental Study Report

March 28th, 2023

Prepared for:
City of Windsor

Prepared by:
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Project Number:
165620239

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EXECUTIVE SUMMARY

GENERAL

The City of Windsor (City), like many other municipalities, has experienced an increase in significant storm events in recent years. Basement flooding, coastal flooding, and surface flooding has occurred across the City, particularly in the Riverside area. In response, the Mayor expedited the completion of the City's Sewer and Coastal Flood Protection Master Plan (SMP). The objective of this comprehensive study was to understand the causes of the widespread flooding; identify areas and locations in which the severe flooding occurs; evaluate high-level alternative solutions to address this flooding; complete high-level design solutions and cost estimates; and provide an implementation strategy and timing for the proposed solutions. The SMP was endorsed by City Council in July of 2020.

The SMP identified recommended improvements for the Riverside area based on the devastating impacts of past and potential future flooding events. One of the solutions identified the need for a new stormwater pumping station and an improved storm sewer outlet to the Detroit River to service the St. Rose drainage area. The proposed pumping station will house three (3) large sized pumps and two (2) smaller duty pumps to improve the outlet capacity and provide flood relief to the St. Rose drainage area. The proposed pumping station capacity will provide a 1:100-year storm level of service for the areas between Riverside Drive to the Via Rail right-of-way (ROW), from Ford Boulevard to east of Lauzon Road. This will include added flood resilience for the following major roadways: Riverside Drive East, Lauzon Road, and Jefferson Boulevard. A back-up power generator will be required as part of the project to provide standby power in the event of a power outage.

The purpose of this study is to identify, evaluate, and report on the preferred location and alternative design concepts for the St. Rose stormwater pumping station and storm sewer outlet. This evaluation will include the conceptual design of the proposed St. Rose pumping station including the site location, site layout, pumping technology, and proposed architectural design of the on-site electrical building. The project objective is to identify the recommended pumping station design to meet flood mitigation objectives in the St. Rose drainage area. This Environmental Assessment report is the documentation of the Class Environmental Assessment (Class EA) process outlined by the Municipal Engineers Association (MEA) for the St. Rose stormwater pumping station and storm sewer outlet.

This report comprises **Sections 1 to 9** inclusive and **Appendices A to D** inclusive. A brief description of each section follows.

SECTION 1: INTRODUCTION

This section provides background information and a description of the Class EA process and outlines the 5 various phases.

The SMP was prepared in accordance with Phases 1 and 2 of the Municipal Class EA process. Through the SMP, the proposed St. Rose stormwater pumping station project was identified as a Schedule C project. This Class EA for the St. Rose stormwater pumping station and storm sewer outlet has been carried out in accordance with Phases 3 and 4.

SECTION 2: STUDY AREA CONDITIONS

All projects identified through the Municipal Class EA process must be evaluated based on the potential impact to 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.

SECTION 3: PROBLEM STATEMENT

This section provides an overview of the existing stormwater collection system, identifies the problem statement, and establishes the project objective.

SECTION 4: DESIGN SOLUTION FOR ST. ROSE DRAINAGE AREA AS OUTLINED IN THE SMP

This section presents an overview of the work undertaken for Phase 2 of the Class EA process, which was completed as part of the SMP study. Phase 2 involves the identification and evaluation of various alternative solutions with the objective of determining which solution best addresses the problem statement.

SECTION 5: DESIGN CONCEPTS AND RECOMMENDATIONS FOR ST. ROSE PUMPING STATION

This section presents the details of the work undertaken for Phase 3 of the Class EA process, which was completed as part of this study. In this section of the ESR, alternative design concepts are presented and evaluated leading to the selection of the recommended design, which satisfies the overall preferred solution identified under Phase 2. 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.

SECTION 6: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This section identifies the potential environmental impacts of the recommended solution and describes the recommended mitigation measures.

SECTION 7: CONSULTATION

This section documents agency and public consultations that occurred during Phase 3 of the Class EA process. This section includes documentation of consultation with the public and review agencies. In order to complete Phase 4 of the Class EA process, this report will be made available for review and comment by the public and review agencies as part of the consultation process.

SECTION 8: OPINION OF PROBABLE COST

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

SECTION 9: SUMMARY

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

1.0 INTRODUCTION

1.1 BACKGROUND

1.1.1 GENERAL

The City of Windsor (City) has experienced a significant increase in extreme storm events in recent years in addition to record high water levels in Lake St. Clair and the Detroit River. These climatic and hydrological factors have resulted in significant basement, coastal, and surface level flooding throughout the city and surrounding municipalities. Coastal zones and low-lying areas, which includes Riverside and a majority of East Windsor, are at considerable risk for flood events that can negatively impact the community and cause damage to municipal infrastructure, residential / commercial properties, and local transportation networks.

The Intergovernmental Panel on Climate Change (IPCC) noted that it is increasingly clear climate change has influenced several variables, including precipitation and snowmelt, which may contribute to localized flooding. Climate change and more specifically anthropogenic influence has contributed to the intensification of extreme precipitation events worldwide. In North America, the likeliness of heavy precipitation events is set to increase in the future resulting in more frequent, intense, and unpredictable precipitation events. The Windsor Climate Change Adaptation Plan (2020) outlines the local data regarding climate change and projects that an increase in severe precipitation events is to be expected in the future. In addition, high water levels in Lake St. Clair and the Detroit River are putting a strain on the municipal storm sewer systems and poses a risk to property owners in coastal and low-lying areas.

To better understand causes of and to develop solutions to reduce the risk of basement, surface, and coastal flooding, the City carried out a comprehensive study known as the Sewer & Coastal Flood Protection Master Plan (SMP). The SMP identified the need for a new stormwater pumping station and new storm sewer outlet to the Detroit River to service the St. Rose drainage area. The proposed pumping station will house three (3) large sized pumps and two (2) smaller duty pumps to improve the outlet capacity and provide flood relief to the St. Rose drainage area. The proposed pumping station capacity will provide a 1:100-year storm level of service for the areas between Riverside Drive and the Via Rail ROW and from Ford Boulevard to east of Lauzon Road. This will include added resilience for the following major roadways: Riverside Drive East, Lauzon

Road, and Jefferson Boulevard. In addition, a back-up power generator will be provided for standby power.

The existing storm sewer collection system servicing the St. Rose gravity outfall extends generally from Wyandotte Street (north limits) to South National Street (south limits) and St. Rose Avenue / Virginia Avenue (east limits) to Jefferson Boulevard (west limits). The existing storm sewer collection system is shown in **Figure 1.1** of **Appendix A**. The proposed St. Rose pumping station and collection system upgrades will modify the service areas for the St. Rose drainage area and the nearby Ford drainage area. This project will include conveyance improvements along Riverside Drive East, expansion of the St. Rose drainage area, and reduction of the Ford Boulevard drainage area. This includes relocating drainage areas north of South National Street to the St. Rose drainage area. The proposed storm sewer collection system expansion will service the new St. Rose pumping station and extend generally from the Detroit River (north limits) to South National Street (south limits) and St. Rose Avenue / Virginia Avenue (east limits) to Thompson Boulevard / Esdras Place (west limits). The proposed drainage area is shown in **Figure 1.2** of **Appendix A**.

1.1.2 SEWER & COASTAL FLOOD PROTECTION MASTER PLAN (SMP)

To assess and develop solutions reducing the risks of basement, surface, and coastal flooding, the City carried out a comprehensive study known as the Sewer & Coastal Flood Protection Master Plan (SMP). The SMP study was initiated in the Spring of 2018 and was completed in the Summer of 2020. The purpose of the SMP study was to understand the causes of flooding; identify locations of basement, surface, and coastal flooding; evaluate alternative solutions; complete high-level design and cost estimates for proposed infrastructure improvements; and provide an implementation strategy for the recommended solutions. The SMP report can be accessed through the following web link: Sewer and Coastal Flood Protection Master Plan (citywindsor.ca).

The SMP was carried out under the direction of a Technical Advisory Committee that included representatives from the Essex Regional Conservation Authority (ERCA), the City of Windsor, Aquafor Beech Ltd. (Aquafor), and Dillon Consulting Ltd (Dillon). The engineering and planning team assembled to complete the study included Dillon as lead consulting firm, partnered with Aquafor and AMG Environmental Inc.

The SMP Study was carried out in general accordance with the Municipal Engineer's Association Municipal Class EA Master Plan Process, an approved process under the provincial *Environmental*

Assessment Act. It included a planning and design process and public open house consultation sessions to provide information on the study findings and solicit input on preferred stormwater management strategies.

As part of the SMP, the City considered short-term and long-term solutions. Short-term solutions were defined as those which can be implemented in a relatively short time (ex. 0 to 10 years) and/or do not require significant capital investment, such as LID's, which reduce the quantity of precipitation getting into the sewer system. Through municipal policies, subsidy programs, and collaborative improvements stormwater infrastructure upgrades may be carried out. This may include the use of sewage ejector pumps; mandatory downspout disconnection; stormwater surcharges and green infrastructure credits; sanitary rain catchers and maintenance hole sealing; infrastructure maintenance and assessment; design standards, and sewer backflow prevention devices.

Long-term solutions were defined as those which will take longer than 10 years to implement and may involve a significant capital investment. These include measures to improve the sewer systems by increasing downstream outlet capacity through increased pumping capacity or enlarging outlets to receiving systems; source control and private property measures; reducing sanitary sewer inflow and infiltration; combined sewer separation; coastal protection through overland flood barriers and backflow prevention; and improving sewer system conveyance and storage capacity.

Long-term solutions identified in the SMP for the East Windsor Area, near the proposed St. Rose pumping station, include the following improvements:

- Construct 40 km of new storm sewers in East Windsor;
- Improve existing sewer pipes by upgrading from 300 mm diameter circular pipes to 4200 mm x 1800 mm box culverts in certain regions of East Windsor;
- Design and install five (5) stormwater storage facilities at the following locations with the corresponding storage volumes:
    - Brumpton Park → 4,725 m^3
    - Wyandotte Street East at Watson Avenue → 7,000 m^3
    - 8380 Wyandotte Street East → 5,000 m^3
    - Meadowbrook Park → 5,000 m^3
    - Roseville Garden Park → 31,625 m^3

- Design and construct a new stormwater surcharge storage pond in the Little River Golf course with a storage volume of 20,000 m^3;
- Design and construct two (2) new stormwater pumping stations with the corresponding pumping capacity:
    - St. Rose Pumping Station with a firm pumping rate of 13.5 m^3/s
    - Pontiac Pump Station (Little River Pollution Control Plant (LRPCP) Overflow) capacity upgrade such that the new pumping station provides an additional firm pumping rate of 2.5 m^3/s
- Upgrades and modifications to existing pumping stations:
    - St. Paul Pump Station capacity upgrade such that the total firm pumping rate is 18.2 m^3/s
    - Ford Pump Station pump replacement such that the total firm pumping rate is 0.5 m^3/s
    - East Marsh Pump Station pump replacement such that the total firm pumping rate is 1.7 m^3/s
- Upgrade Lakeview Pumping Station to increase pump rate to 0.65 m^3/s. Improve the outlet pipe to Detroit River by replacing the existing 300 mm diameter outlet pipe with a 600 mm diameter outlet pipe;
- Make improvements to the existing landform barrier along Riverside Drive and construct a new landform barrier where required to meet the flood protection elevations;
- Install backflow prevention measures for sewers crossing the proposed landform barrier;
- Design and install local storm sewers adjacent to the landform barrier ranging in size from 450 mm to 525 mm in diameter; and
- Provide emergency infill areas where temporary flood protection measures are required to provide a continuous barrier.

The Class EA process for the proposed St. Rose pumping station started in September of 2021. The City of Windsor has initiated this Class EA for the St. Rose pumping station as one of the steps in implementing the SMP.

1.1.3 THE WINDSOR CLIMATE CHANGE ADAPTATION PLAN

The City of Windsor has a long-standing commitment to both Climate Change Mitigation and Adaptation Planning. This corporate environmental commitment was made through the development of an Environmental Master Plan in 2017 which was further developed through the

Climate Change Adaptation Plan in 2020. The Windsor Climate Change Adaptation Plan was developed by the City of Windsor and ICLEI Canada Project Staff working closely with a Community Task Force and various City of Windsor departments.

In the Windsor Climate Change Adaptation Plan, the City determined that average precipitation values are expected to increase in the future, particularly in the seasons of winter and spring. The summer months may see a slight decrease in precipitation coupled with increasingly warm seasonal temperatures. In terms of extreme precipitation, the intensity and frequency of events is expected to increase in the future corresponding to a 25% increase in 10-year storm events and 40% increase in 100-year storm events. For example, the City of Windsor has already experienced two 100-year storms in the years 2016 and 2017. On average more rain is expected to fall (in terms of intensity, mm/hr and total depth, mm) during these periods of extreme precipitation. The water levels in Lake Erie and Lake St. Clair have been above average values since 2013 and, in 2019, the Detroit River reached a high-water level of 176.08 meters. In the near climate future, water levels are expected to continue to be high. In the distant climate future, the water levels are projected to decrease in the Great Lakes partially due to warmer temperatures and changing precipitation patterns.

The City will continue to prepare for the climate future by creating a more climate resilient city. The City will continue to minimize climate change risks to the community through the advancement of sustainable policies, infrastructure investment, and public education. Forward thinking and proactive steps will benefit the community health, environment, and economy. The climate change mitigation and planning objectives for the City of Windsor include:

1. Integrate Climate Change Thinking and Response
2. Protect Public Health and Safety
3. Reduce Risk to Buildings and Property
4. Strengthen Infrastructure Resilience
5. Protect Biodiversity and Enhance Ecosystem Functions
6. Reduce Community Service Disruptions
7. Build Community Resilience

The Class EA for the proposed St. Rose pumping station will identify and recommend improvements to the outlet capacity and provide flood relief to the St. Rose drainage area. This project will address the City's climate change adaptation plan objectives by strengthening the infrastructure resilience, reducing risk to buildings and property, and protecting public health and safety.

1.1.4 PURPOSE OF REPORT

This is an Environmental Study Report (ESR) for the proposed St. Rose stormwater pumping station and storm sewer outlet. This ESR provides a summary of the rationale, planning, design, and consultation process of the project. This ESR includes a general introduction, review of existing conditions; problem statement; presentation of design solutions identified in the SMP; identification and evaluation of alternative site locations, alternative design concepts and recommendations.

Prior to the evaluation of the design concepts, a review of the SMP and the comments received through the SMP stakeholder consultation process, identified a need for a further in-depth evaluation of the proposed pumping station location. As a result, the alternative design concepts evaluated as part of Phase 3 of this Municipal Class EA included the site location, site layout, pumping technology, and preliminary architectural design of the on-site electrical building. These alternative design concepts are presented and evaluated leading to the selection of the recommended design for the proposed St. Rose stormwater pumping station and storm sewer outlet. The evaluation process is based on minimizing undesirable social, natural environment, and economic impacts and this ESR presents detailed rationale for each alternative design concept. Where impacts on social, natural environmental, and economic environments are unavoidable, proposed mitigating measures are presented for consideration to minimize those impacts.

1.2 CLASS ENVIRONMENTAL ASSESSMENT PROCESS

1.2.1 GENERAL

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 recognized that certain undertakings occur frequently, are small in scale, and have a generally predictable range of effects; or have minor environmental significance with the inclusion of a process to approve class environmental assessments as the process to ensure proper planning and engagement on such projects. Under the Act, many municipal stormwater, wastewater, water, roads, and transit projects proceed through the approved Municipal Engineers Association (MEA) Municipal Class EA process (Class EA). The work undertaken in preparation of this study report follows the planning and design process of the Municipal Class EA, October 2000, as amended in 2007, 2011 and 2015.

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. 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 process:

- **Schedule A and 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 Phases 1 through 4 for Schedule C projects, the Owner may proceed directly to Phase 5 and implement the preferred solution.

1.2.2 PHASES IN MUNICIPAL CLASS EA PROCESS

Figure 1.3 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 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 – Document in an Environmental Study Report (ESR) the planning, design, and consultation activities that outline the decision-making process for the project. The ESR is placed on the public record for a 30-day period to allow for review by 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.

2.0 STUDY AREA CONDITIONS

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

2.1 GENERAL DESCRIPTION OF THE STUDY AREA

The City of Windsor is located in Southwestern Ontario on the south shore of the Detroit River and Lake St. Clair directly across from the City of Detroit, Michigan. The population of Windsor is approximately 230,000 with a total land area of approximately 145.3 square kilometers (12,063 hectares). Settlement in the Windsor area dates back to the 1700's with a population of 200 being reported in 1836 and 2,500 in 1892. Development generally started along the riverfront and progressed southerly away from the river as the population increased. More recently, the Canadian Census Program shows the population of the City increased from 217,188 in 2016 to 229,660 in 2021. The Windsor Census Metropolitan Area (which includes the Towns of Amherstburg, LaSalle, Lakeshore, and Tecumseh) is the 14th largest metropolitan area in Canada.

The riverfront area of the City extends from Lake St. Clair approximately 22.5 km downstream to the west limit of the City. The long-term average discharge of the Detroit River is 5,200 m^3/s with mid-channel surface currents of 1 to 1.2 m/s at the Ambassador Bridge. Flow travel time along the riverfront study area from Lake St. Clair to the western City limit is approximately 8 to 9 hours. There are numerous existing uses of the Detroit River as described in the "Detroit River Remedial Action Plan, Stage 1" dated 1991.

- The river supports over sixty species of resident and migratory fish with an associated strong sport fishery.
- The river provides habitat for many resident and migratory birds.
- The river is heavily used for commercial navigation as part of the Great Lakes-St. Lawrence Seaway system with Detroit being the busiest port on the Great Lakes.
- The river is used as a source of cooling water supply for several industries.

- There are five municipal drinking water intakes in the river including the City of Windsor intake in the study area and the Town of Amherstburg intake in the lower reaches of the river near Lake Erie.
- The river serves as a receiving water for municipal and industrial discharges.
- The Detroit River is an important recreational resource used for activities such as swimming, water skiing, jet skiing, scuba diving, fishing, boating, waterfowl viewing and waterfowl hunting.
- The two bathing beaches on the Canadian shore are located upstream of the study area (Sand Point Beach and Stop 26).
- There are extensive park areas in the City of Windsor bordering on the river.

Riverside is a neighbourhood located in the eastern section of the City of Windsor. The Riverside area is characterised by its waterfront road, Riverside Drive, which follows the southern shoreline of the Detroit River. The neighbourhood of Riverside extends generally from Westminster Boulevard to the Windsor/Tecumseh town borderline. The St. Rose drainage area, which is the focus of this study, is located in the Riverside neighbourhood of the City of Windsor. The proposed drainage area considered in the study is shown in **Figure 1.2** of **Appendix A** and is generally described as the lands lying between South National Street and the Detroit River extending from St. Rose Avenue / Virginia Avenue in the east to Thompson Boulevard / Esdras Place in the west. The topography of the land in the study area is relatively low lying and flat with a fall of 2 to 2.5 metres per kilometre from the southern limit of the study area to the river.

2.2 LAND USE

The study area for this project falls within the proposed St. Rose drainage area which extends from South National Street to the Detroit River, as shown in **Figure 1.2** of **Appendix A.** The St. Rose drainage area contains a majority of the Riverside neighbourhood including the Olde Riverside Town Centre and business association district. The project study area is mostly composed of residential dwellings, multi-residential dwellings, and parkland as well as some commercial establishments. All of the developed lands within this area are serviced by separate sanitary sewers and storm sewers with the exception of a short combined sewer branch on Jefferson Boulevard between Wyandotte Street and Riverside Drive.

2.3 EXISTING STORMWATER FACILITIES AND INFRASTRUCTURE

The existing St. Rose gravity outfall is located north of the intersection of Riverside Drive and St. Rose Avenue and services the existing St. Rose drainage area. The proposed St. Rose drainage area, which is the focus of this ESR, is neighboured by the Ford Buckingham drainage area and the St. Paul drainage area on the west and east, respectively. Information regarding the three drainage areas is provided in the following sections as background information and to provide context as to the layout and capacity of existing stormwater infrastructure in the region.

2.3.1 ST. ROSE GRAVITY OUTFALL

The stormwater collection system in the existing St. Rose drainage area drains by gravity to the Detroit River through the existing outfall in St. Rose Beach Park. The St. Rose gravity outfall is a stormwater outlet that is located on a 0.7-hectare (1.5 acres) park site at 6902 Riverside Drive East, north of the intersection of Riverside Drive and St. Rose Avenue. The existing St. Rose gravity outfall receives stormwater from a 1525 mm rectangular incoming storm sewer. The St. Rose gravity outfall drainage area extends generally from Wyandotte Street (north limits) to South National Street (south limits) and St. Rose Avenue / Virginia Avenue (east limits) to Jefferson Boulevard (west limits). The existing storm sewer collection system is shown in **Figure 1.1** of **Appendix A**. The St. Rose gravity outlet was originally constructed in 1976 and has been operational ever since. This outlet provides service for stormwater collected in the St. Rose drainage area; however, it is not able to handle wet weather flows during severe storm events (greater than a 1:5-year storm event).

2.3.2 FORD BUCKINGHAM PUMPING STATION

The Ford Buckingham drainage area is located immediately west of the St. Rose drainage area and will be modified to reattribute land east of Thompson Boulevard / Esdras Place to the St. Rose drainage area. The Ford Buckingham drainage area is generally from the Detroit River (north limits) to Tecumseh Road East on the west end or South National Street on the east end (south limits) and Jefferson Boulevard (east limits) to Westminster Boulevard (west limits).

The Ford Buckingham pumping station is a stormwater pumping station located on a 4.25-hectare (10.5 acres) park site at 5270 Riverside Drive East near the intersection of Riverside Drive and Ford Boulevard. The stormwater from the Ford Buckingham drainage area flows by gravity to the pumping station where it is lifted and discharged directly to the Detroit River. The Ford Buckingham pumping station was originally constructed in 1987 and has been in operation ever since.

2.3.3 St. Paul Pumping Station

The St. Paul drainage area is located immediately east of the St. Rose drainage area. The St. Paul drainage area is from the Detroit River (north limits) to South National Street (south limits) and Lauzon Road (west limits) to St. Rose Ave (east limits). The stormwater from the St. Paul drainage area flows by gravity to the pumping station where it is lifted and discharged directly to the Detroit River. The St. Paul Pumping Station is a stormwater pumping station located on a 1.75-hectare (4.5 acres) park site at 7730 Riverside Drive East near the intersection of Riverside Drive and Lauzon Road. The St. Paul stormwater pumping station was originally constructed in the mid-1970s and has been in operation since October of 1976. The station has a firm capacity of 9.3 m^3/s and a total capacity of 12.5 m^3/s. There are two mechanical coarse bar screens located at the St. Paul pumping station and installed upstream of the stormwater pumps. In the case of an emergency where the normal electrical feed is interrupted, the station is equipped with a 2,600 HP diesel driven generator.

As an ongoing part of the SMP, the City of Windsor intends to commence upgrades to the St. Paul Stormwater Pumping Station in the near future. This work will include upgrades to the existing pumping station that will include an additional firm capacity of 9.3 m^3/s. This project is an important part of a City-wide solution to address flooding concerns and will provide improved protection to residents during extreme weather events.

2.4 NATURAL ENVIRONMENT

2.4.1 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.

2.4.2 GEOLOGY AND PHYSIOGRAPHY

The City of Windsor is located in the physiographic region of Southwestern Ontario known as the St. Clair Clay Plains. As the name suggests the area is covered with extensive clay plains. The topography of the area is extremely flat with elevations ranging from 175 to 204 meters above sea level.

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.

2.4.3 SOILS AND SUBSURFACE CONDITIONS

Soils within the County of Essex were formed from heavy ground moraine, which has been altered by glacial lake wave action and lacustrine deposition. The majority 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. 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 clay deposits found in the majority of the Windsor area consist of a stiff silty clay to clayey silt deposited without significant stratification and possessing a distinctively till-like structure with a small fraction of sand and gravel sized particles distributed randomly throughout. In the west end of Windsor, this till-like deposit is overlain by a lacustrine deposit of soft to firm, layered silty clay. This deposit was laid down in the glacial lakes in front of the ice sheet during their retreat in the post glacial period, when the level of Lake Erie was considerably higher than it is at present. These layered strata, of varying thicknesses and strengths, are known to exist up to 30 meters in total depth.

Geotechnical investigations were carried out by Golder Associates to evaluate the condition, historical geological, and geotechnical information within the study area, near the proposed pumping station location. There are four (4) geotechnical reports in Golder's records for lands in the immediate vicinity of the proposed pumping station dated from 1973 to 2018. The borehole investigations determined that there are five (5) soil layers on the site: (i) topsoil, (ii)sandy silty clay fill, (iii) granular fill, (iv) native sandy silty clay, and (v) native sandy silty clay to clayey silt.

Based on the preliminary soil assessment carried out at St. Rose Beach Park, the excavation materials will be composed of two types (1) native sandy silty clay material and (2) sandy silty clay fill material. The silty clay fill materials may be re-used for industrial, commercial, and community land use onsite or offsite. This will be beneficial as the excess soil produced from excavation may be used for landscaping features within the park or at other community locations across the City. The native sandy silty clay materials were found to have molybdenum concentrations exceeding the Ontario Excess Soil Quality Standards (ESQS) Table 1. This excess concentration was determined to be naturally occurring and is well known to occur in southwestern Ontario due to glacial silt or clay deposits. This native soil can be re-used onsite for landscaping features; however, offsite re-use may be subject to regulatory restrictions. The excess soil produced for the construction of the proposed pumping station is anticipated to exceed landscaping soil requirements. During the detailed design of the proposed pumping station the native soil material can be prioritized for re-use onsite and fill material can be beneficially re-used for other projects across the City. The soil and sediment conditions of these two materials do not represent a hazard to human health of the ecosystem. The soil report for the St. Rose Beach Park is included in **Appendix D**. Prior to the start of any construction, project specific geotechnical investigations should be carried out to confirm the findings of previous reports, fill in any gaps not tested in previous studies and evaluate any changes in the water table levels.

2.4.4 NATURAL VEGETATION

The City 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 St. Rose drainage area consists mainly of residential properties with manicured lawns and various landscaping features as well as parks with open greenspaces and paved walking paths. Stantec completed a site investigation on October 15, 2021, to document existing natural heritage conditions in the study area. Surveys included Ecological Land Classification (ELC) of vegetation communities, a Species at Risk (SAR) habitat assessment of terrestrial features, and a fish habitat assessment of the Detroit River shoreline. The natural heritage features that were identified through the background review were confirmed during the field surveying. The natural heritage impact assessment report is included in **Appendix D**.

Potential impacts associated with the proposed construction of the St. Rose Pumping Station include soil compaction, siltation, and spills of deleterious substances into the Detroit River, noise disturbance, and encounters with wildlife. The 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.

2.4.5 TERRESTRIAL LIFE

The land uses in the study area support a limited number of small animals such as squirrels and rabbits that have adapted to human activity. Installation of the St. Rose Pumping Station will not result in an impact on vegetation communities. No permanent impact to breeding birds, reptiles and other wildlife is expected as a result of the installation of the St. Rose Pumping Station provided appropriate mitigation measures are followed.

The artificial shoreline may provide suitable nesting habitat for Barn Swallow. Investigations are recommended to be carried out during the breeding bird season to confirm if Barn Swallows are nesting on the artificial shoreline structure. No impacts to Barn Swallow are expected as a result of the St. Rose Pumping Station installation provided mitigation measures are followed as outlined in the Natural Heritage Impact Assessment Report (**Appendix D**).

2.4.6 MARINE LIFE

The study area includes the Detroit River, which serves as the receiving body of the proposed pumping station and supports a variety of marine and aquatic species. As a major watercourse that connects Lake St. Clair with Lake Erie, this river provides habitat for a diverse fish community. As many as 139 native species have been documented in the Great Lakes by the Great Lakes Fishery Commission. At least 34 non-native fish species are present in the Great Lakes, including Round Goby and Sea Lamprey. Installation of the St. Rose Pumping Station will result in a short-term impact to fish habitat as a result of the temporary isolation and dewatering of the work area required to construct the outlet. No permanent impacts to fish and fish habitat are expected as a result of the installation of the St. Rose Pumping Station provided mitigation and contingency measures are followed.

2.5 CULTURAL, SOCIAL, AND ECONOMIC ENVIRONMENT

2.5.1 STUDY AREA

The study area, within the boundaries of the St. Rose drainage area, can be described as a primarily residential community. The study area contains a mixture of residential, parkland, and commercial developments. The study area is well served with a good road system and a full range of utilities including electrical power, water, natural gas, and telephone.

2.5.2 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 includes direction on key land use planning issues which have been applied in this Class EA for evaluating alternative design concepts as part of Phase 3.

2.5.3 OFFICIAL PLAN

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

The Official Plan notes that the study area contains four designations. St. Rose Beach Park is designated as Open Space; the properties along the north side of Riverside Drive East are designated Waterfront Residential; the area on the north side of Wyandotte Street East is designated Mixed Use Corridor, and the remainder of the area is designated Residential.

A number of provisions found in the s. 8 Urban Design chapter of the Official Plan apply to the lands. These provisions concern views and vistas. The provisions encourage the preservation and enhancement of views to the Detroit River. When preparing the final design plans for the pumping station these provisions will be taken into consideration and addressed at that time.

2.5.4 CULTURAL HERITAGE ENVIRONMENT

Cultural heritage resources include archaeological resources, built heritage resources and cultural heritage landscapes.

2.5.4.1 Archeological Resources

Windsor is an area rich in cultural heritage resources and diversified cultural traditions. The areas along the Detroit River are ones with high cultural and historical significance. **Figure 2.1** of **Appendix A** shows a map, taken from the City's Archeological Master Plan (2005), identifying areas with high archeological potential, which typically require archeological assessments. The map identifies St. Rose Beach Park as an area containing high archeological potential.

Based on the recommendations provided in the SMP, a Stage 2 Archaeological Assessment (AA) (under Project Information Form number P256-0697-2021) was undertaken by Stantec Consulting Ltd. Stage 2 AA consists of a site visit, where a consultant archaeologist will conduct a general survey of the whole property to identify all archaeological resources that may be present. The survey consists of walking a ploughed field looking for artifacts lying on the surface of the ground or test pitting unploughable areas at regular intervals and screening the soil for artifacts. Its purpose is to identify areas of archaeological potential and recommend further AA (e.g., Stage 3-4) as necessary. No archaeological resources were identified during the Stage 2 archaeological assessment at the site. Therefore, no further land-based archaeological assessment of the study area is required. The Stage 2 AA Report was submitted by Stantec to the Ministry of Tourism, Culture and Sport (MTCS) on July 6th, 2022, and is included in **Appendix D**. A letter from the MTCS informing that this report was entered into the Ontario Public Register of Archaeological Reports was received on July 6th, 2022. This confirmation letter is included in **Appendix D**.

A Marine Archaeological Overview Assessment (MAOA) was carried out by Stantec Consulting Ltd. MAOA consists of a site visit and literature review, where a consultant archaeologist will conduct a general survey of the marine portions of property to identify all archaeological resources that may be present. Criteria for assessing marine archaeological potential can include proximity to registered archaeological sites (terrestrial and marine), proximity to reported or registered wreck sites, proximity to active or historical harbours or marine terminals, proximity to watercourses and associated narrows, rapids, waterfalls, or portage routes, and also includes proximity to inundated landscapes. Its purpose is to identify areas of archaeological potential and recommend further assessments as necessary. Due to deep and extensive river-bed disturbance from land reclamation activities, as well as a lack of any additional indicators of marine archaeological potential, it has been determined that the marine study area retains low to no potential for the identification and documentation of in situ Indigenous and Euro-Canadian marine archaeological resources. Therefore, no further marine archaeological work is required for the study area. The MAOA report for this project is included in **Appendix D.** The MAOA report was submitted to the MTCS on July 5th, 2022.

2.5.4.2 Built Heritage Resources and Cultural Heritage Landscapes

The screening checklist, Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes, developed by the MTCS (now Ministry of Citizenship and Multiculturalism (MCM)), was completed as part of the project file. The heritage resources around the proposed work area were identified based on the Windsor Municipal Heritage Register provided by the City of Windsor. The City of Windsor's Planning and Building Services Department was also consulted to determine the location and details of Built Heritage and Cultural Heritage Landscapes. The completed checklist is included in **Appendix D**. The study area was determined to have low potential for built heritage resources and cultural heritage landscapes. Therefore, no technical cultural heritage studies have been undertaken as part of this Class EA.

3.0 PROBLEM STATEMENT

3.1 PROBLEM IDENTIFICATION

The City of Windsor has experienced several significant storm events in recent years that have resulted in widespread basement and surface flooding. Through the comprehensive SMP study, the Riverside Area and more specifically the St. Rose drainage area was identified as a problem area due to the high risk of basement, surface, and coastal flooding. The St. Rose drainage area is at high risk for these types of flooding due to its low elevation and close proximity to the Detroit River. This area was identified to have a high potential for basement flooding during wet weather events with significant risk to residential properties in the case of storm events exceeding a 1:5-year recurrence. Further, the Riverside area between Ford Boulevard and the east City limits (which includes the St. Rose drainage area) was identified as a coastal flood risk area. A coastal flood risk area is defined as those areas that are at risk of flooding due to overtopping of the existing shoreline from unusually high lake/river level conditions or storm surges. As a result of the SMP study, it was confirmed that under extreme storm events the St. Rose drainage area is at risk of basement and surface flooding.

The St. Rose drainage area is currently serviced by a gravity storm sewer outlet located beneath the paved walkway in St. Rose Beach Park. This outlet provides service for stormwater collected in the existing St. Rose drainage area; however, it is not able to handle wet weather flows during severe storm events (greater than the 1:5-year storm event). In the SMP, the City identified solutions to increase the level of service in the St. Rose drainage area and provide increased flood protection. Failure to have adequate stormwater infrastructure in place will negatively impact the community and increases risk of damage to municipal infrastructure, residential properties, and local transportation networks.

3.2 PROJECT OBJECTIVE

The City of Windsor has initiated this Class EA to determine the preferred location and design of the proposed St. Rose stormwater pumping station and storm sewer outlet as recommended in the Sewer & Coastal Flood Protection Master Plan. The purpose of this EA study is to identify, evaluate, and report on the preferred location and design alternatives for the St. Rose stormwater pumping station and storm sewer outlet.

4.0 DESIGN SOLUTION FOR ST. ROSE DRAINAGE AREA AS OUTLINED IN THE SMP

This section presents an overview of the work undertaken for Phase 2 of the Class EA process. Phase 2 involves the identification and evaluation of various design solutions with the objective of determining which alternative best addresses the problem statement. Phase 2 for this project was completed as part of the SMP, which can be accessed through the following web link:

Sewer and Coastal Flood Protection Master Plan (citywindsor.ca).

More specifically, the decision-making process under the SMP for the St. Rose drainage area can be found in the SMP appendix 'Appendix E – Technical Volume 2: Flood Reduction Alternative Solution Development' within the appendix 'E-2: St. Rose Avenue Pumping Station – Pumping Station Location Comparative Evaluation (October 2020):

https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Documents/Appendix_E_-_Technical_Repot_Volume_2_-_Solution_Development_-_November_2020.pdf

4.1 PROPOSED PUMPING STATION CAPACITY

In order to reduce the risk of flooding in the St. Rose drainage area, the SMP determined the following actions are required: provide a new pumping station at the location of the existing St. Rose Outlet; provide conveyance improvements along Riverside Drive East; and expand the St. Rose drainage area (to reduce the Ford outfall drainage area). The new pumping station is proposed to house three (3) large sized pumps and two (2) smaller pumps to improve the outlet capacity and provide flood relief to area residents.

As outlined in the SMP, the intention for the design of the pumping station is to provide service for the Climate Change Storm (1 in 100-year storm + a 40% climate change factor). Through the SMP, it was determined that Low Impact Development (LID) features such as exfiltration trenches or bioswales, could be utilized upstream to reduce the required capacity and size of the proposed pumping station. For that reason, the pumping station will be designed with a firm capacity of 13.5 m^3/s to provide service for the 1 in 100-year storm event.

This 1 in 100-year storm flow was confirmed during the Class EA process using a hydraulic model of the proposed St. Rose drainage area, which was produced using PCSWMM 7.4.3220. The pumping station capacity was determined based on the required infrastructure improvements and the overall improvement to the level of service that is provided to the Riverside area residents and surrounding road network. The functional design of the pumping station, including an evaluation for the preferred location, and specific site features are to be determined throughout this Schedule C Class Environmental Assessment and refined based on further stakeholder input.

4.2 PROPOSED DRAINAGE AREA

The storm sewer collection system servicing the existing St. Rose gravity outfall extends generally from Wyandotte Street (north limits) to South National Street (south limits) and St. Rose Avenue / Virginia Avenue (east limits) to Jefferson Boulevard (west limits). The existing storm sewer collection system is shown in **Figure 1.1** of **Appendix A**. The proposed pumping station and collection system upgrades will modify and disconnect the service areas for the St. Rose drainage area and the nearby Ford drainage area. The Ford drainage area is generally higher in elevation than the St. Rose stormwater collection system; therefore, it is less susceptible to coastal flooding from high lake levels. Removing the interconnection between the Ford and St. Rose stormwater systems will mitigate backwater of the higher Ford system into the St. Rose system. This includes relocating drainage areas north of South National Street to the St. Rose drainage area. The proposed St. Rose pumping station will service the area generally from the Detroit River (north limits) to South National Street (south limits) and St. Rose Avenue / Virginia Avenue (east limits) to Thompson Boulevard / Esdras Place (west limits). The proposed drainage area is shown in **Figure 1.2** of **Appendix A**.

4.3 PROPOSED LOCATION OF THE PUMPING STATION

During the SMP process, four (4) viable locations were evaluated to accommodate the proposed St. Rose pumping station. The four alternatives are as follows:

- Alternative No. 1 – Construct the St. Rose Avenue Pumping Station in the St. Rose Beach Park greenspace on the north side of Riverside Drive East.
- Alternative No. 2 – Construct the St. Rose Avenue Pumping Station to the south of Riverside Drive and east of St. Rose Avenue.
- Alternative No. 3 – Construct the St. Rose Avenue Pumping Station to the south of Riverside Drive and west of St. Rose Avenue.

- Alternative No. 4 – Construct the St. Rose Avenue Pumping Station at the northwest corner of the intersection at St. Rose Avenue and Wyandotte Street East.

The analysis of the location alternatives took into consideration the following functional design elements: a new pumping station wet well structure to house 3 large sized pumps and two smaller sized pumps (firm capacity of 13.5 m^3/s); a building structure to house the electrical systems and pump controls; a back-up power generator to provide standby power; an on-site power transformer; vehicle access points; and landscaping features.

An evaluation was completed under the SMP to identify the best location, which was determined to be St. Rose Beach Park. Before proceeding with the evaluation of the design concepts, a review of the SMP and the comments received through the SMP stakeholder consultation process, led to a further in-depth evaluation of the pumping station location alternatives. The evaluation was based on the following criteria - **social factors** (impacts to local communities, archaeological and historic sites, recreational areas, other utilities, etc.), **natural environment factors** (air, climate, vegetation, fish and wildlife, surface drainage and groundwater, soil and geology, utilization of existing infrastructure, etc.), and **economic factors** (capital cost and operational and maintenance cost). Further, the evaluation process considered minimizing undesirable social, natural environment, and economic impacts while maximizing performance and efficiency, minimizing space requirements, and reducing operation and maintenance requirements. The results of this evaluation are presented as a technical memorandum (memo), entitled 'St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment – Schedule 'C' - Comparative Evaluation of Site Location', which is available in **Appendix B**. The memo presents detailed rationale for each criterion and summarizes the findings using a scoring system to quantify the evaluation of each alternative relative to these criteria. Where impacts are unavoidable, either through construction or operation of the proposed facility, potential mitigation measures are presented for consideration to minimize or negate those impacts.

Through this detailed analysis, St. Rose Beach Park was identified as the preferred site for the proposed pumping station based on its ability to satisfy a majority of the evaluation criteria. This location meets flood mitigation objectives and utilizes mitigation measures to reduce any undesirable social impacts. This site provides the most flexibility to adjust to climate change with room for potential expansion to meet future needs if required. This location eliminates the need for a forcemain, which improves operational conditions and makes for a more reliable stormwater management solution. This site is located at the most downstream point of the existing stormwater collection system which permits direct access to the main storm sewer and results in relatively simple construction, operation, and maintenance requirements with the shortest timeline for implementation and construction. In addition, locating the proposed pumping station in the park will not result in the displacement of any existing residents from their homes or businesses from their current place of operation.

5.0 DESIGN CONCEPTS AND RECOMMENDATIONS FOR ST. ROSE PUMPING STATION

5.1 PUMP TECHNOLOGIES

In this section of the report, alternative design concepts for the recommended location are identified and evaluated leading to the selection of a recommended design for this application. The recommended design will include an evaluation of the following alternative pumping technologies:

- Centrifugal Flow Pump
- Axial Flow Pump
- Mixed Flow Pump
- Archimedean Screw Pump

The evaluation of alternative pumping technologies includes consideration of potential environmental, social, and economic impacts and recognizes the need to design the facilities in such a way that they will be as unobtrusive as possible and blend in with existing and proposed uses on the Windsor waterfront. Aside from this, the recommended alternative should maximize performance and efficiency, minimize space requirements, and reduce operation and maintenance requirements.

5.1.1 CENTRIFUGAL FLOW PUMP

The Hydraulic Institute Standards (HIS) defines a centrifugal pump as a kinetic machine that converts mechanical energy into hydraulic energy through centrifugal activity. As fluid enters the pump it is directed to the center of a rotating impeller. The rotational movement of the impeller creates centrifugal force accelerating the fluid radially outward into the diffuser (volute chamber), from which the fluid exits with higher energy than when it entered. Centrifugal pumps are typically non-clog close-coupled pumps. Pumps that are designed for all electrical components to be watertight and submerged below the surface of the water are otherwise known as submersible centrifugal pumps. These pumps may be removed from the wet well for inspection and repair. This type of pump is typically used for raw sewage and other solids bearing fluids.

Centrifugal flow pumps can be used for high head – low flow applications or can be designed to meet a wide range of head and flow requirements making them functional for a variety of applications. Centrifugal pumps can be arranged in a variety of configurations including coupled so that the discharge from one pump feeds the intake of subsequent pumps, thereby increasing the delivery head. In this way it is possible to design centrifugal pumping systems which can meet head requirements greater than a hundred metres. Centrifugal pumps are also able to operate at higher speeds than other types of pumps, especially when higher pressures are required. However, matching the pump operating speeds with the application is crucial to maximizing pump efficiency, as high operating speeds usually require more power and need to be controlled to avoid hydraulic head losses. Centrifugal pumps tend to be less tolerant of solid material entering the stream and while they can be designed to be tolerant of solid material, it is usually at considerable expense to efficiency.

5.1.2 AXIAL FLOW PUMP

The Hydraulic Institute Standards (HIS) defines an axial flow pump as a kinetic machine that converts mechanical energy into hydraulic energy. For axial flow pumps the fluid enters the pump cavity parallel to a central rotating impeller. The rotational movement of the impeller creates a force accelerating the fluid axially outward. As a result, the fluid exits with higher energy than when it entered. A similar analogy to an axial flow pump is a boat motor or propeller, which pushes the water in a single direction to create movement or thrust. Of the various pump types, axial flow pumps are considered to have the highest efficiency; however, the use of this pump type is limited due to its inability to use in high head applications.

Axial flow pumps are high-capacity pumps that are typically used for low head - high flow applications such as stormwater pumping stations. These pumps can be mounted at any angle, although in stormwater applications they tend to be almost universally mounted in the vertical orientation. Typically, axial flow pumps are driven by means of a vertical shaft attached to an external motor that is mounted on the top of the pumping chamber structure. Axial flow pumps tend to be more tolerant of solid material entering the stream; however, large debris should be screened as the propellers may bend or break if they strike a relatively large or hard object. In addition, as with centrifugal pumps, fibrous materials may wrap themselves around the propellers causing maintenance and operational impacts.

5.1.3 MIXED FLOW PUMP

Mixed flow pumps are high-capacity pumps that are typically used for high flow – medium head applications. The mixed flow pump impellers are designed uniquely such that the vanes sweep backwards and the pump functions as a compromise between axial flow pumps and centrifugal pumps. In mixed flow pumps the flow is directed radially and axially along the shaft centerline. As a result, mixed-flow pumps are able to operate at higher head than axial-flow pumps while delivering higher flow rates than centrifugal-flow pumps. Like axial-flow pumps, mixed-flow pumps can be mounted at any angle; however, they are typically mounted in a vertical orientation in stormwater applications. Mixed flow pumps are commonly used for the following applications: transferring water from rivers to canals, flash mixers, filter-to-waste, or intermediate pumping stations.

5.1.4 ARCHIMEDEAN SCREW PUMP

An Archimedean screw pump is a type of positive-displacement pump that provides lift by carrying fluids in the spaces between the screw threads. Screw pumps utilize the Archimedes principle of a rotating shaft to displace the fluid axially as the screws rotate. An inclined screw pump has a continuous spiral vane attached to a central shaft, mounted in a trough or pipe. When the screw is rotated, the spiral vane scoops water from the free water surface at the entrance of the pump and discharges it at a higher elevation. It is a continuous propeller pump and flows are axial, with no centrifugal action. The primary advantage of an inclined screw pump is that it is a natural variable flow pump that operates at a constant speed. As the water level at the inlet rises, the pump inlet becomes more submerged, and is able to scoop more liquid with each rotation.

The Archimedes screw pump is usually large capacity, low head, non-clogging and therefore advantageous in raw sewage and wastewater applications. As a result of the pumping mechanism, screw pumps can provide constant flow rates and pressures and have a relatively high tolerance for solids entering the flow stream. Screw pumps are commonly used in applications where low heads are required (i.e., less than 10 meters). The main disadvantage of screw pumps is the difficulty to increase the pumping head without considerable physical modifications to the structure, whereas this is easy with other types of pumps. Also, since the design is dependent upon minimal leakage from between the flights and the channel, any wear over time significantly reduces efficiency.

5.1.5 EVALUATION OF ALTERNATIVE PUMP TECHNOLOGIES

Four alternatives, which include the centrifugal flow pumps, axial flow pumps, mixed-flow, and screw pumps, were evaluated based on the following evaluation criteria:

- Performance or Effectiveness
- Impact to Park Greenspace
- Impact to Waterfront View
- Capital and Construction Cost
- Operation & Maintenance
- General Concerns

Each pump technology was reviewed and summarized in **Table 5.1.**

Table 5.1: Evaluation of Alternative Pump Technologies

Evaluation Criteria	Centrifugal- Flow Pump	Axial-Flow Pump	Mixed-Flow Pump	Screw Pump
Performance & Effectiveness	• Lower efficiency • Shorter lifetimes	• Very efficient in high flow, low head applications	• Efficient in high flow, low head applications	• Wide range of flow • Difficult to increase head
Impact to Park Greenspace	• Low space requirements	• Low space requirements	• Low space requirements	• Relatively high space requirements
Impact to Waterfront View	• Low sightline obstruction	• Low sightline obstruction	• Low sightline obstruction	• Relatively high sightline obstruction
Capital / Construction Cost	• Relatively low to medium	• Relatively low to medium	• Relatively low to medium	• Relatively high equipment and construction cost
O&M Requirements	• Low to medium O&M requirements	• Low O&M requirements	• Low to medium O&M requirements	• Medium O&M requirements
General Concerns	• Loss of efficiency should solids enter the flow	• Performance is dependent upon providing good inlet flow • Loss of efficiency should solids enter the flow	• Performance is dependent upon providing good inlet flow • Loss of efficiency should solids enter the flow	• Difficult to modify • Requires enclosed channels which are located partially above ground and will impede the view

Based on a detailed review of the four alternative pump technologies, the axial flow pump type was identified as the recommended alternative for this pumping application. Benefits include high efficiency in high flow – low head applications, minimal space requirements, and a low capital cost in comparison to the other alternatives. Axial Flow pumps can be utilized in applications where space is limited which will minimize the amount of park land needed for the pumping structure and minimize the impact to the usability of the park. The low profile of these pumps will allow for the pumping station to be constructed at or below the proposed grade of the park, thereby reducing sightline obstructions.

The simple and proven operation of axial flow pump technology makes this a preferred alternative for this project. General concerns associated with axial flow pumps are the loss of efficiency caused by solids entering the wet well and the need to provide adequate inlet flow conditions. During the final design phase of the pumping station these issues will be addressed by implementing a bar screen at the pumping station inlet to minimize solids entering the pumping chamber and configuring the wet well structure to reduce the turbulent flow conditions.

5.2 SITE LAYOUT

In this section of the report, alternative design concepts for the proposed site layout are identified and evaluated leading to the selection of a recommended design for this application. The evaluation of various layouts included consideration of potential environmental, social, and economic impacts. Due to the nature of this application the environmental and economic impacts are anticipated to be similar regardless of the overall layout.

The objective when developing the site layout options was to design the facilities in such a way that they will be as unobtrusive as possible and blend in with existing and proposed uses of the Windsor waterfront. The layout includes four main components: (i) pumping chambers, (ii) electrical building, (iii) generator with noise enclosure, and (iv) transformer.

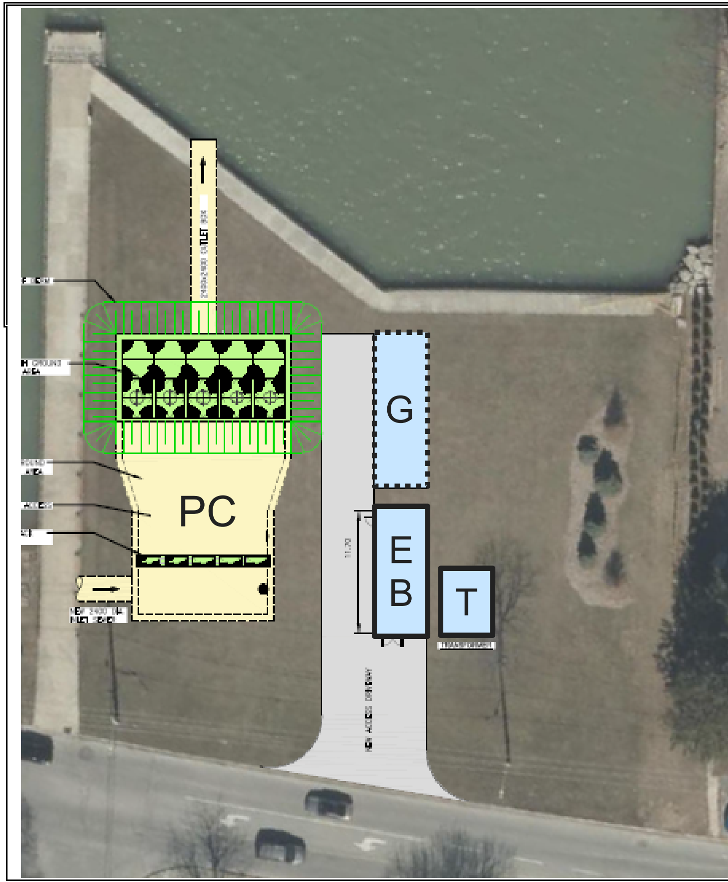
The following layouts were developed with the infrastructure located on the east, west, and central portion of the site in order to conceptualize the impact to the waterfront view, compare potential social impacts, and solicit public opinion.

In an effort to reduce the obstruction to the waterfront view, the footprint and height of the structures are to be minimized during the detailed deign phase to the lowest possible dimension based on the size of commercially available instrumentation and equipment, with consideration for applicable development standards and codes. For example, the pumping station chambers are shown to be located at or below the ground level, which reduces the disruption to the waterfront view.

The exact dimensions, position, and elevation of the pumping station, electrical building, generator, and transformer will be determined prior to construction, during detailed design, which is a potential future phase of this project (Phase 5, Implementation).

5.2.1 ALTERNATIVE NO. 1

Site Layout Alternative No. 1 features the pumping chambers along the western promenade with electrical equipment located in the central portion of the site as shown below in **Figure 5.1A** and in greater detail in **Figure 5.1B** of **Appendix A**. In this layout, the pumping chambers and outlet structure will be located on the west side of the site next to the existing paved walkway. The pumping chambers will be located at or below grade and are represented in green and yellow in the figure. The access driveway as well as the electrical building and emergency generator will be located east of the proposed pumping station. The electrical building, emergency generator, and transformer will be located above grade; therefore, they will have an impact on the view. These above grade features being in the centre of the site, significantly impact the unobstructed waterfront views when looking from any position south of the site. The central location of the electrical building, generator, and transformer limits the functionality or usability of the park greenspace.



On Grade

Below Grade

Above Grade

Green Driveway

PC = Pumping Chambers

EB = Electrical Building

G = Generator with Noise Enclosure

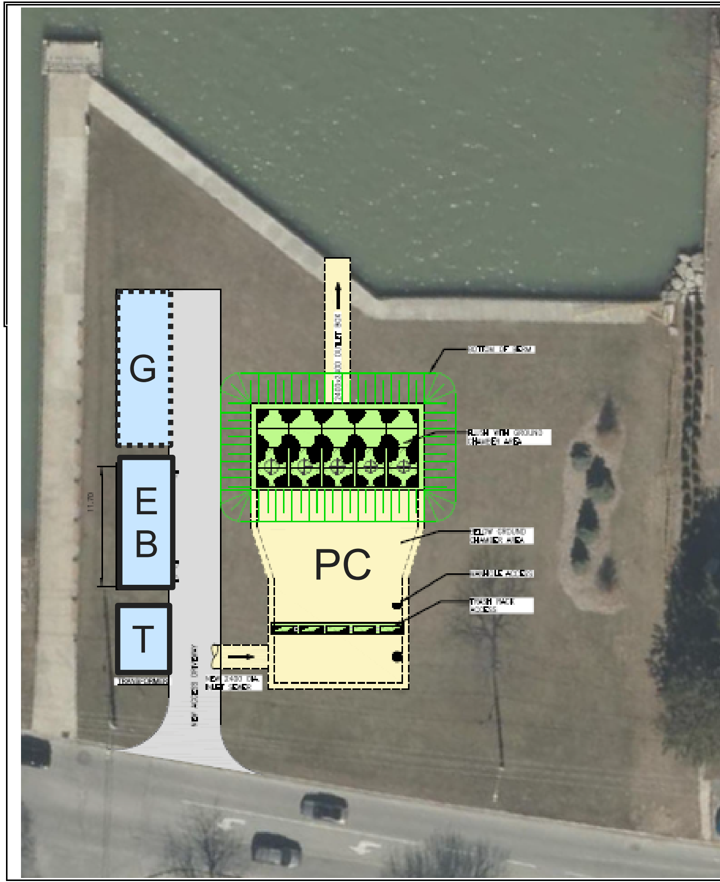
T = Transformer

Note: Preliminary layouts presented in this figure are for display purposes and may be subject to change during the implementation phase (detailed design).

Figure 5.1A: Site Layout Alternative No. 1

5.2.2 Alternative No. 2

Site Layout Alternative No. 2 features the pumping chambers in the central portion of the site and all electrical equipment along the west side of the property as shown in **Figure 5.2A** and in greater detail in Figure **5.2B** of **Appendix A**. In this layout, the electrical building and emergency generator will be located on the west side of the site next to the existing paved walkway. The access driveway as well as the pumping chambers and outlet structure will be located east of the proposed electrical equipment. The pumping chambers will be located at or below grade and is represented in green and yellow in the figure. The electrical building, emergency generator, and transformer will be located above the existing grade; therefore, they will impact the waterfront view. These above grade features located along the west side of the site, impact the waterfront views from any position south of the site. The western location of the above grade features would slightly limit the functionality or usability of the park greenspace as it forms a barrier between the promenade and the open space.



On Grade

Below Grade

Above Grade

Green Driveway

PC = Pumping Chambers

EB = Electrical Building

G = Generator with Noise Enclosure

T = Transformer

Note: Preliminary layouts presented in this figure are for display purposes and may be subject to change during the implementation phase (detailed design).

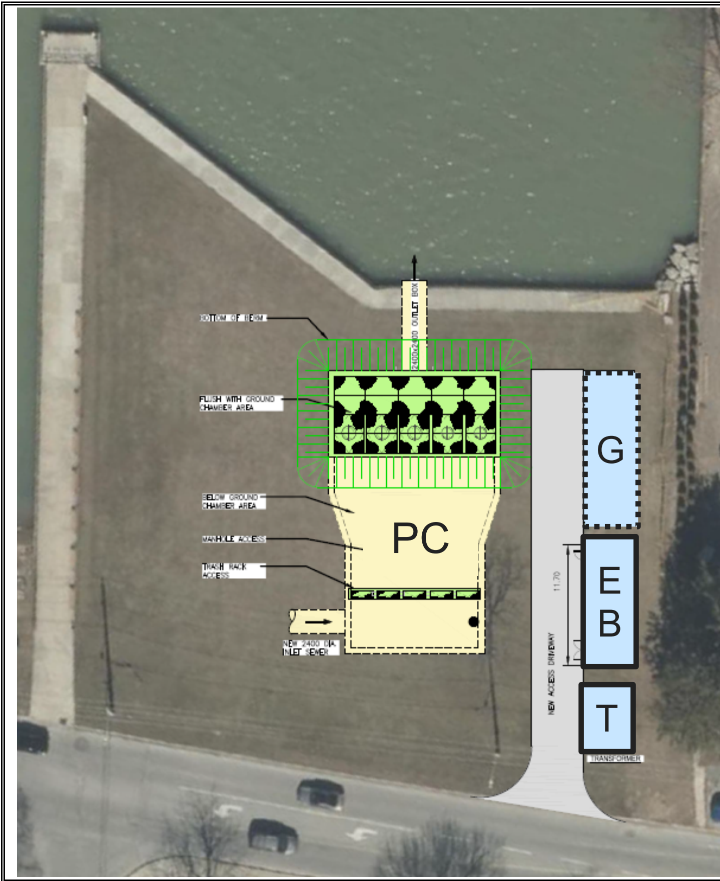
Figure 5.2A: Site Layout Alternative No. 2

5.2.3 ALTERNATIVE NO. 3A/3B

Site Layout Alternative No. 3A features the pumping chambers and electrical equipment on the central and eastern portion of the site as shown in **Figure 5.3A** and in greater detail in Figure **5.3B** of **Appendix A**. With this layout, the electrical building and emergency generator will be located along the east side of the site adjacent to the treeline of the neighbouring property. The access driveway as well as the pumping chambers and outlet structure will be located west of the proposed electrical equipment. The pumping chambers will be located at or below grade and are represented in green and yellow in the figure. The electrical building, emergency generator, and transformer will be located above the existing grade; therefore, there will be impacts to the waterfront view. These above grade structures aligned along the east side of the site are less impactful to the waterfront view, as the buildings are intended to be a continuation of residential buildings along the north side of Riverside Drive. The location of the structures would also reduce the impact to the functionality and usability of the park. However, with this layout the generator building will be located closer to the house located east of the site.

Based on additional comments and input received following Public Information Centre No. 2, the Alternative No. 3A site layout was revised to further improve the functionality of the site and to minimize impacts to adjacent property owners, while still maintaining sightlines of the Detroit River. Alternative No. 3B is displayed below in **Figure 5.4A** and in greater detail in **Figure 5.4B** of **Appendix A**. This layout features the pumping chambers below grade in the center of the site and rotated 90 degrees to reduce the width (parallel to the water) and improve the view of the Detroit River. With the pumping chambers located underground, a large part of the park will still be accessible for recreational use.

The location of the electrical building, emergency generator, and transformer remain near the east property line. The generator is shown at a greater distance from the adjacent house reducing potential noise and vibration impacts to the resident. This was achieved by locating the electrical building and generator immediately adjacent to each other near the southeast property lines. A decorative fence or wall is proposed to be included around the generator to further dampen potential noise and vibration impacts as well as improve the overall appearance of the generator. Similar to Alternative 3A, these above grade features are situated along the east side of the site to reduce impacts to the waterfront view in comparison to Alternative No. 1 or 2. With this option the sightlines of the waterfront are largely maintained particularly the view of the U.S.A. and Belle Island on the north and northwest. Although the impact to the view is greater than that for Alternative No. 3A, mitigating potential noise and vibration impacts was prioritized.



On Grade

Below Grade

Above Grade

Green Driveway

PC = Pumping Chambers

EB = Electrical Building

G = Generator with Noise Enclosure

T = Transformer

Note: Preliminary layouts presented in this figure are for display purposes and may be subject to change during the implementation phase (detailed design).

Figure 5.3A: Site Layout Alternative No. 3A

On Grade Below Grade Above Grade Green Driveway Decorative Wall	PC = Pumping Chambers EB = Electrical Building G = Generator with Noise Enclosure T = Transformer	Note: Preliminary layouts presented in this figure are for display purposes and may be subject to change during the implementation phase (detailed design).

Figure 5.4A: Recommended Site Layout Alternative No. 3B

5.2.4 Evaluation of Alternative Site Layouts

All site layout options were evaluated based on the following evaluation criteria:

- Impact to Waterfront View
- Impact to Park Greenspace
- Noise and Vibration Impacts

- Generator Emission Impacts
- General Concerns

Each site layout alternative was reviewed and is summarized in **Table 5.2**.

Table 5.2: Evaluation of Alternative Site Layouts

Evaluation Criteria	Alternative No. 1	Alternative No. 2	Alternative No. 3A/3B
Impact to Waterfront View	• Above grade infrastructure in the centre of the site • Obstructed waterfront view for a majority of the site • Obstructs view of the U.S.A. and Belle Isle • Obstructs view of the sunset and annual Detroit-Windsor Fireworks	• Above grade infrastructure aligned with western promenade • Obstructed waterfront view with buildings along the west side of the site • Obstructs view of the U.S.A. and Belle Isle • Obstructs view of the sunset and annual Detroit-Windsor Fireworks	• Above grade infrastructure aligned with the eastern property line • Unobstructed view with buildings adjacent to the eastern property line • Minimal impact to the view of the U.S.A. • Minimal obstruction to the view of the sunset and annual Detroit-Windsor Fireworks
Impact to Park Greenspace	• Greenspace is divided into two sections (on either side of the infrastructure) • Electrical equipment forms a barrier between the east/west sides of the site • Building and generator location reduces the functionality of the park	• Large undisturbed greenspace (on the east side of the site) • Electrical equipment forms a barrier between the east/west sides of the site • Building and generator location reduces the functionality of the park	• Large undisturbed greenspace (on the west side of the site) • Building and generator location reduces impact to the park functionality
Noise and Vibration (1)	• Generator and pumping chamber are moderate distance from adjacent properties	• Generator and pumping chamber are farthest from adjacent properties	• Generator and pumping chamber are closest to adjacent properties

Generator Emission (2)	• Moderate distance from adjacent properties	• Farthest distance from adjacent properties	• Closest to adjacent properties
Technical Feasibility	• Adequate distance from existing outlet improving ease of construction • Adequate space for inlet flow diversion chamber	• Minimal distance from existing outlet reducing ease of construction • Minimal space for inlet flow diversion chamber	• Adequate distance from existing outlet improving ease of construction • Additional space for inlet flow diversion chamber
General Concerns	• Larger impact to the view for residential properties in the immediate vicinity	• Larger impact to the view for residential properties in the immediate vicinity	• Less impact to the view for residential properties in the immediate vicinity
Notes: (1) Designed in accordance with the Ontario Ministry of Environment, Conservation and Parks (MECP) Environmental Noise and Vibration Guidelines, which will ensure the appropriate engineering control measures are in place. (2) Designed in accordance with MECP emission requirements, which will ensure the appropriate engineering control measures are in place. The generator will be designed with a hospital grade enclosure which would mitigate noise and vibration impacts to adjacent properties.			

Based on a detailed evaluation of the alternative site layouts, Alternative No. 3B was identified as the recommended alternative for the proposed St. Rose pumping station. This layout is displayed above in **Figure 5.4A** and in greater detail in **Figure 5.4B** of **Appendix A**. The recommended layout features the pumping station below grade in the center of the site with the emergency generator and electrical building near the south property line and east property line (evergreen treeline). Benefits of this site layout include improved technical suitability as well as the ability to minimize negative social impacts to the park greenspace and waterfront view. This layout is adequately spaced from the existing outlet and permits adequate space for the proposed inlet flow diversion chamber which will increase the overall ease of construction. In terms of social impact, grouping the above grade features on the southeast side of the site works to minimizes the visual emphasis of the structures as the buildings are intended to be a continuation of residential buildings along the north side of Riverside Drive. This layout will reduce the impact on the waterfront view for a majority of the site, particularly of the U.S.A. and Belle Island on the north and northwest. Overall, the location of the structures would reduce the impact to the functionality and usability of the park.

The mechanical and electrical systems will be designed in accordance with MECP emission requirements, which will ensure the appropriate engineering control measures are in place. It is recommended that a detailed noise study is carried out and the generator be designed with a hospital grade enclosure to mitigate off-site noise and vibration emissions. Details regarding these noise and vibration mitigation measures are outlined in **Section 6.3.3**.

5.2.5 AMENDMENTS TO THE TECHNICAL MEMO

Through the continuation of the Environmental Assessment process and in consideration of the comments received through the SMP stakeholder consultation process, a further in-depth evaluation of the pumping station location alternatives was completed under the scope of this study. The results of this evaluation are presented as a technical memorandum (memo), entitled 'St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment – Schedule 'C' - Comparative Evaluation of Site Location', which is available in **Appendix B**.

Through this detailed analysis, St. Rose Beach Park was identified as the preferred location for the pumping station. Subsequent to the completion of this analysis, various alternative site layouts were evaluated for the preferred location at St. Rose Beach Park. Layout Alternative No. 3B was identified as the recommended alternative. This layout is displayed above in **Figure 5.4A** and in greater detail in **Figure 5.4B** of **Appendix A.**

Based on the recommended site layout (Alternative No. 3B) a review of the technical memo evaluation was completed to ensure that the scoring reflected the updated layout. After review, all evaluation criteria remained relevant and the scoring for each remain unchanged except for the following – Section 3.2.2.4 Permanent Changes to Urban Community including the following subsections: (i) Noise and Vibration Impacts and (ii) Generator Emission Impacts.

Noise and Vibration Impacts

Alternative No. 1 Score: ~~4~~ → 3

Alternative No. 2 Score: 2

Alternative No. 3 Score: 2

Alternative No. 4 Score: 3

The score for Alternative 1 is now reflective of the change in the recommended site layout.

In terms of the noise and vibration impacts, permanent changes to the urban community are anticipated to be minimal due to the abatement measures and mitigation methods that will be implemented in the pumping station design. The proposed pumping station will be designed in accordance with stringent sound/vibration attenuation requirements and generator emission regulations of the Ontario Ministry of Environment, Conservation, and Parks (MECP). This will ensure the appropriate engineering control measures are in place to minimize noise and vibration emissions to the surrounding neighbourhood.

It is important to note that this is a stormwater pumping station and the stormwater pumps are designed to operate during rainfall events; therefore, equipment on the site will not produce noise or vibrations on a regular basis. The noise and vibrations caused by the pumps in the wet well structure will be minimized by properly designing the foundation structure. The noise and vibrations caused by the generator will be minimized by properly designing the generator foundation structure, ensuring proper installation and alignment, noise enclosures, landscape or fencing buffers and/or other mitigation measures. The generator will be designed with a hospital grade enclosure which would mitigate noise and vibration impacts to surrounding neighbours, particularly adjacent properties.

Based on the revised site layout, the distance between the pumping chambers or generator and the nearest residence will be approximately equal for all four site alternatives. For Alternative No. 1, the proposed pumping station would be adjacent to one residential property on the east, across Riverside Drive from residential properties to the south, adjacent to the Detroit River to the north and a natural embayment to the west. Based on this, the proposed pumping station would have great separation on two sides, good separation on one side, and adequate separation on one side. Mitigation methods such as enhanced landscaping or fencing buffers may be used on the east side of the site to further minimize impact to the adjacent property. For Alternative No.’s 2 and 3, the proposed pumping station would be adjacent to two residential properties on the south and east/west, across St. Rose Avenue from residential properties on the west/east, and across Riverside Drive from the Detroit River and St. Rose Park on the north. Based on this, the proposed pumping station would have great separation on one side, good separation on one side, and adequate separation on two sides making it less favourable than Alternative No. 1. For Alternative No. 4, the proposed pumping station would be adjacent to one residential property on the north, one commercial property west, across St. Rose Avenue from one residential and one commercial property on the east, and across Wyandotte Street from an institutional greenspace (St. Rose Catholic Elementary School) on the south. Based on this, the proposed pumping station would have good separation on three sides, and adequate separation on one side making it more favourable than Alternative No.’s 2 and 3. For these reasons, Alternative No.’s 1 and 4 received a score of ‘Good’ and Alternative No.’s 2 and 3 received a score of ‘Fair’.

Generator Emission Impacts

Alternative No. 1 Score: ~~4~~ → 3

Alternative No. 2 Score: 2

Alternative No. 3 Score: 2

Alternative No. 4 Score: 3

The score for Alternative 1 is now reflective of the change in the recommended site layout.

Any permanent changes to the surrounding residents are anticipated to be minimal due to abatement measures and mitigation methods that will be included in the pumping station design. It is important to note that this is a stormwater pumping station and the generator equipment will only operate during a significant rainfall event in which there is a power outage or during regular maintenance testing. Modern emergency power generators are manufactured to comply with MECP regulations and are more efficient than traditional diesel generators. The emissions caused by the generator will be minimized by proper design of the generator exhaust system, ensuring regular maintenance and servicing, landscaping, or fencing buffers and/or other mitigation methods. The proposed pumping station will be designed in accordance with the MECP Guidelines. The MECP has stringent emission requirements which will ensure the appropriate engineering control measures are in place and minimize emissions to the surrounding neighbourhood.

Based on the recommended layout, the distance between the generator and the nearest residence will be approximately equal for the four location alternatives. Based on the level of separation discussed in the 'Noise and Vibration Impacts' Section (above), Alternative No.'s 1 and 4 received a score of 'Good' and Alternative No.'s 2 and 3 received a score of 'Fair'.

The evaluation matrix from the technical memo has been updated to reflect the changes to the scores outlined above and is shown in **Table 5.3** (below).

Table 5.3: Updated Evaluation Matrix from Technical Memo

Evaluation Criteria	**Score (1 → 4)**			
	Alternative No. 1	**Alternative No. 2**	**Alternative No. 3**	**Alternative No. 4**
Technical Criteria				
Ability to Meet Flood Mitigation Objectives	4	4	4	4
Flexibility to Adapt to Climate Change	4	2	2	2
Coastal Flood Risk	3	4	4	4
Anticipated Maintenance Requirements	4	3	3	3
Time Required for Implementation	3	2	2	1
Complexity of Installation and Operation	-	-	-	-
Pumping Station Wet Well and Equipment	4	3	3	1
Pumping Station Excavation Dewatering	3	3	3	4
Excavation Material Management	4	2	2	2
Demolition of Existing Structures	4	1	1	1
Storm Sewer Installation	4	2	2	1
Extent of Existing Utility Relocation	4	3	3	1
Social Criteria				
Disruption During Construction	3	2	2	1
Impacts to Archaeological, Built & Cultural Heritage	4	4	4	4
Development Policies	1	4	4	4
Permanent Changes to Urban Community	-	-	-	-
Noise and Vibration Impacts	~~4~~ → 3	2	2	3
Generator Emissions	~~4~~ → 3	2	2	3
Disruption or Displacement of Existing Residents and/or Businesses	4	1	1	1
Disruption to Waterfront Parklands	1	4	4	4
Disruption to Waterfront Views	1	4	4	4
Natural Environment Criteria				
Impacts to the Natural Environment	4	4	4	4
Better Use of Existing Infrastructure	4	3	3	2
Economic Criteria				
Relative Capital Cost	4	3	2	1
Relative Operation and Maintenance Cost	4	3	3	2
Total Score: (xx/92)	**~~79~~ → 77**	**65**	**64**	**57**

The overall ranking of the four location alternatives remains unchanged and St. Rose Beach Park remains the highest ranked and the preferred location for the proposed pumping station.

5.3 ARCHITECTURAL DESIGN OF THE ON-SITE ELECTRICAL BUILDING

In this section of the report, alternative design concepts for the proposed architectural design of the electrical buildings are identified and evaluated leading to the selection of a proposed design for this application. The evaluation of designs included consideration of potential environmental, social, and economic impacts and recognizes the need to design the facilities in such a way that they will be as unobtrusive as possible and blend in with existing and proposed uses along the Windsor waterfront. Due to the nature of this application, the environmental impacts are anticipated to be similar regardless of the selected design.

5.3.1 ALTERNATIVE NO. 1

Architectural Design Alternative No. 1 features a simple and modern style façade as shown in **Figure 5.5**. Other features of this design style include the use of high-quality materials, limestone façade, wooden accents, and simple exterior windows. Green infrastructure is implemented in this design through the use of a green roof. Environmental benefits of green roofs include air purification, increased biodiversity, decreased urban heat island effect, and reduced stormwater runoff. This design is based on modern architectural styles which have become popular in the twenty first century. Modern style homes are less common in the St. Rose neighbourhood; however, there is merit for the use of this architectural style for a public building within a parkland.

Figure 5.5: Architectural Design Alternative No. 1

5.3.2 ALTERNATIVE NO. 2

Architectural Design Alternative No. 2 features a traditional architectural style with redbrick façade as shown in **Figure 5.6**. Other features of this design style include the use of high-quality materials, limestone and redbrick façade, wooden beam accents, and modern black trim windows. The roof style utilized in this design is a traditional gable roof with dormers. This design is based on residential-industrial architectural styles which have been utilized for other pumping stations throughout the City of Windsor. For example, a similar design style was utilized at the Howard and Walker Road Railway Underpass Pumping Stations that were built in recent years. Traditional style redbrick homes are common in the St. Rose neighbourhood and there is merit for the use of this architectural style from an urban design perspective.

Figure 5.6: Architectural Design Alternative No. 2

5.3.3 ALTERNATIVE NO. 3

Architectural Design Alternative No. 3 features a modern-residential architectural style with limestone façade as shown in **Figure 5.7**. Other features of this design style include the use of high-quality materials, limestone façade, and modern black trim windows. The roof style utilized in this design is a mansard roof. This design is based on residential architectural styles that have been utilized in the vicinity of the St. Rose Beach Park. For example, a similar design style is utilized for the residential properties to the east and southwest of the park.

Figure 5.7: Architectural Design Alternative No. 3

5.3.4 EVALUATION OF ALTERNATIVE ARCHITECTURAL DESIGNS

The three above-described alternatives were evaluated based on the following evaluation criteria:

- Design Style
- Materials
- Cultural and Built Heritage
- Lifecycle Cost

The three design alternatives were reviewed based on the criteria listed above and are summarized in **Table 5.4**.

Table 5.4: Evaluation of Alternative Architectural Designs

Evaluation Criteria	Alternative No. 1	Alternative No. 2	Alternative No. 3
Design Style	• Simple / modern style • Green roof for added environmental benefits	• Traditional residential style • Gable roof with dormers and wood beam accents	• Modern residential style • Mansard roof with dormers
Materials	• High quality building materials • Limestone façade	• High quality building materials	• High quality building materials • Limestone façade

	• Wood accents • Simple windows	• Redbrick and limestone façade • Wood beam accents • Black trim windows	• Black accents • Black trim windows
Cultural and Built Heritage	• Merit as a public building within a parkland setting • Modern style homes are less common in the St. Rose neighbourhood • Similar to recent park buildings built throughout the City of Windsor	• Merit from an Urban design perspective • Traditional redbrick homes are common in the St. Rose neighbourhood • Similar to recent pumping stations built throughout the City of Windsor	• Similar to residential buildings immediately adjacent to the park and throughout the St. Rose neighbourhood
Lifecycle Cost	• Moderate to high capital cost • High capital and maintenance cost associated with the green roof	• Moderate capital cost • Moderate maintenance cost	• Moderate capital cost • Low maintenance cost

Based on the evaluation of the three architectural designs, Alternative No. 3 was identified as the preliminary recommendation for the proposed St. Rose pumping station electrical building. This design style complements the existing built and cultural heritage of the neighbourhood and has a relatively low lifecycle cost. Alternative No. 3 features a modern residential architectural style, as shown in **Figure 5.7,** which will be well suited for the St. Rose Beach Park and surrounding neighbourhood. The use of high-quality materials, limestone façade, black trim windows, and mansard roof with dormers is similar to nearby residential properties in an effort to blend with the existing built heritage of the neighbourhood. Alternative No. 3 was generally the most preferred by local residents based on the feedback provided at the public open houses and in comment submissions. The details for the architectural design of the building should be further reviewed, refined, and evaluated during the implementation phase (detailed design). This process to finalize the architectural design will include consultation with adjacent property owners.

5.4 OVERVIEW OF RECOMMENDED DESIGN

The recommended design concepts that form the overall recommended design are summarized in **Table 5.5**. **Section 5.0** identified, evaluated, and reported on site layout, pumping technology, and architectural design of the electrical building to determine the recommended pumping station design. The recommended design meets the requirements outlined in the SMP to reduce the risk of flooding in the St. Rose drainage area. Phase 5 of the Class EA process, the implementation phase, will include detailed design and construction and is anticipated to start in 2023 and be completed by 2026.

Table 5.5: Summary of Recommended Design

Design Concept	Recommendation
Pump Technology	Axial Flow Pump Benefits Include: • Due to pumps being located underground, there is little to no obstruction to waterfront views • Smaller footprint • High efficiency in high-flow low-head applications • Low to medium capital cost • Low operations and maintenance cost
Site Layout	Site Layout Alternative No. 3B features the pumping station chambers in the centre and electrical equipment situated near the east property line as shown in **Figure 5.4A**. Benefits Include: • Best technical suitability with adequate space for construction and inlet flow diversion chamber • Lowest impact to the waterfront views • Minimal impact to view of the U.S.A., sunset, and annual Detroit-Windsor Fireworks in comparison to the other alternatives • Large area of undisturbed greenspace on the west side of the site, which minimizes the impact to the park functionality
Architectural Design of On-Site Electrical Building	Architectural Design Alternative No. 3 features a modern-residential architectural style with limestone façade as shown in **Figure 5.7.** Benefits Include: • High quality building materials and modern residential style which complements existing built and cultural heritage of the homes in the St. Rose neighbourhood • Moderate capital cost • Low maintenance cost

A preliminary plan and sectional view of the proposed pumping station is shown in **Figure 5.8** of **Appendix A**. A preliminary hydraulic profile for the proposed pumping station is shown in **Figure 5.9** of **Appendix A**. Preliminary three-dimensional renderings of the recommended pumping station design were prepared and are shown in **Figure 5.10A** and **Figure 5.10B** (below). All of the stormwater sewers and proposed pumping station dimensions, location, and elevations are obtained from the City Sewer Atlas and SMP.

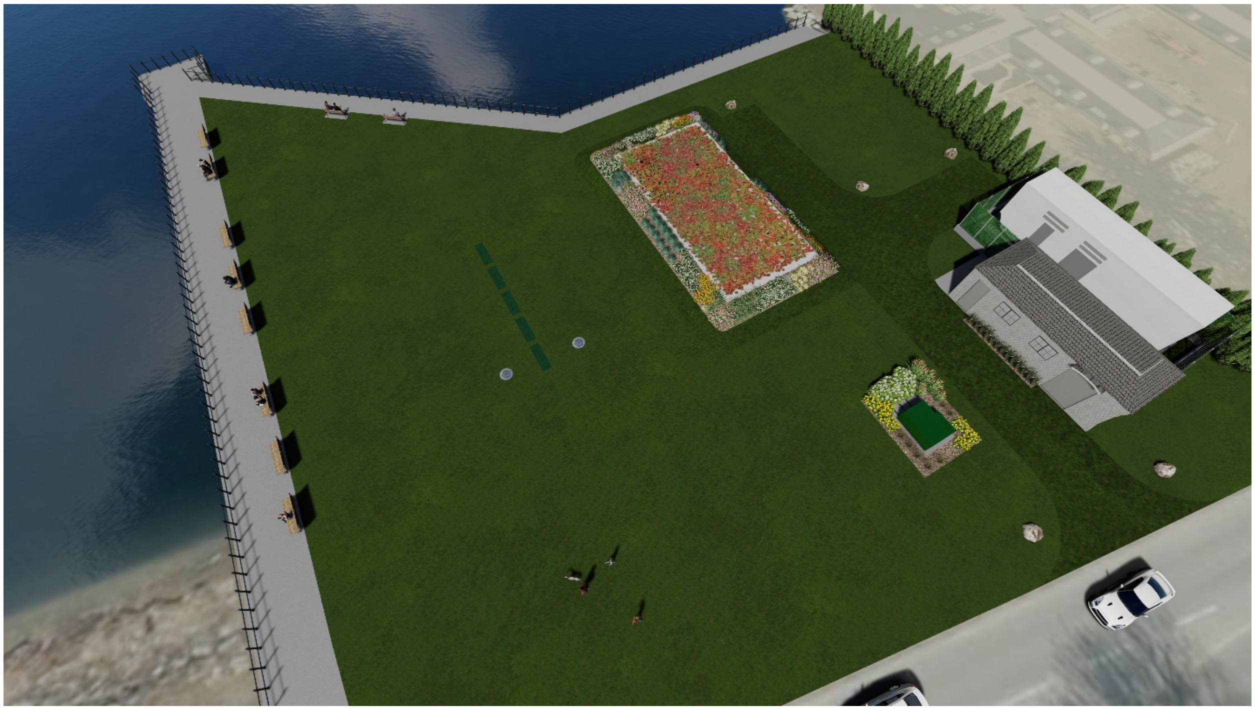


Figure 5.10A: Birds Eye View of the Overall Recommended Design

Figure 5.10B: Ground Level View of the Overall Recommended Design

5.4.1 CONSIDERATIONS FOR DETAILED DESIGN (PHASE 5 – IMPLEMENTATION)

The exact dimensions, position, and elevation of the pumping station, electrical building, generator, and transformer will be determined during detailed design, which is a potential future phase of this project (Phase 5, Implementation). The height and footprint of the electrical building, and generator will be reduced as much as possible during this phase.

During the detailed design phase for the proposed pumping station additional field investigations and/or background reviews should be completed to confirm the type and dimensions of the structural support system used for the break wall on the northern edge of the site. The existing break wall supports are likely tie-back type with a section of soil (immediately inside the break wall) that should not be disturbed. The pumping chambers should be located at a sufficient distance from the break wall to maintain the structural integrity of the support system. Therefore, the exact position of the pumping chambers may be dictated by the break wall support system and should be reviewed during the detailed design phase.

Part of the SMP solution identified the need for a landform barrier (or berm) along Riverside Drive to protect the area from potential coastal flooding effects. The St. Rose Beach Park is within the area of concern identified in the SMP as well as the Regulated Area of the Essex Region Conservation Authority (ERCA). As such, the top elevation of the pumping chambers, and the bottom elevation of the electrical building and generator must be selected to provide effective protection against coastal flooding. During detailed design and the Site Plan Control (SPC) process, various City internal departments and regulatory agencies will provide comment. Comments received from regulatory agencies during the EA phase shall also be reviewed and considered during detailed design. These comments can be found in **Appendix C**. This site will be subject to review by the ERCA and will be required to meet the flood mitigation standards as set by this Authority. Therefore, the required ground elevation and thus the height of the buildings will be dependent upon their standards and requirements.

It is recommended that the generator be designed with a hospital grade enclosure which would mitigate noise and vibration impacts to adjacent properties. The noise mitigation specifications for a generator casing and silencers will be reviewed, and the sound power of the generator will be modeled to review the noise impact. A hospital grade enclosure would limit the sound from the generator, which could be further reduced by landscaping buffers. An acoustic audit is also recommended to verify the conditions on site.

The design of outdoor lighting on the site may be dictated by site plan control requirements, as well as the functional requirements on the site. Options for controlled lighting including incorporating full cut-off lighting where practical will be considered during detailed design.

The landscaping will be designed to improve the overall aesthetic of the park, and the architectural features of the above grade structures will be designed to complement the character of the existing neighbourhood. The specific material and finish of the electrical building and decorative fence/wall around the generator will be defined during the detailed design stage.

6.0 ENVIRONMENTAL IMPACTS AND MITIGATING MEASURES

6.1 OVERVIEW

Table 6.1 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 pumping station will be the most disruptive phase of the project due to construction activities. **Table 6.1** identifies potential environmental impacts during construction. It is anticipated that the recommended work will not have a significant effect on the natural environment such as wildlife, vegetation, or the habitat characteristics of any particular species.

With respect to other socio-economic impacts, it is anticipated that the preferred alternative will not have any serious lasting impact on cultural activities, heritage resources or any other community program. During the construction phase of this project, it is anticipated that construction activities would result in some level of temporary disruption to the community and nearby residents. The impacts on air quality, noise, and vibration, and community life will be mitigated through standard construction procedures. A proposed mitigation measure to be employed during the construction phase of this project is the use of a field ambassador. This field ambassador would be available to the community as a point of contact to maintain dialogue ahead of and during construction. This allows impacted community members voice their concerns throughout the process and stay informed of planned construction activities and mitigation measures.

Table 6.1 Environmental Effects and Mitigating Measures

OPERATION	EFFECT	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.	➢ This is not a concern as there is no significant existing terrestrial wildlife habitat in the proposed area of construction
	Loss of unique or otherwise valued vegetation features	➢ There are no known unique vegetation features in the area that may be disturbed by construction activities. ➢ Where possible, existing vegetation features will be restored to a preconstruction condition.

OPERATION	EFFECT	MITIGATING MEASURES
Trenching and tunnelling for sewers / Excavation and construction for electrical building, generator foundation, and pumping chambers	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.) ➢ Prevent contaminated runoff to the Detroit River by providing treatment as appropriate ➢ 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. ➢ 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	➢ Employ tree protection measures ➢ Replace trees and provide site landscaping ➢ No tree removals shall be undertaken without approval from the City of Windsor
	Temporary disruption of pedestrian and vehicle traffic	➢ Provide and maintain detours ➢ Provide for safe alternate routes ➢ Select alternate routes to minimize inconvenience ➢ Coordinate with other construction projects in the neighbourhood to minimize traffic disruptions
	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 ➢ Coordinate with other construction projects in the neighbourhood to minimize disruptions to adjacent properties, buildings, and residents

OPERATION	EFFECT	MITIGATING MEASURES
	Removal of excavated material.	➢ If contaminated material is discovered during construction handle and dispose of material in an acceptable manner based on the Preliminary Soil Characterization Report (Appendix D)
	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. ➢ 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.
	Disruption of 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.	➢ Use erosion and sediment control techniques for stockpiled materials to minimize degradation of water quality. ➢ An emergency spill kit will be kept on site during construction activities. ➢ Service equipment shall be washed and/or refuelled no closer than 30 m from watercourses to reduce the risk of deleterious substances entering the watercourse. ➢ Construction machinery shall be cleaned prior to entering the site to reduce the potential for ➢ establishment of invasive species, such as Phragmites
	Modifications or removal of aquatic habitat.	➢ Stage construction to minimize potential for adverse impacts.

OPERATION	EFFECT	MITIGATING MEASURES
	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 ➢ Construction and tree protection fencing shall be installed prior to the start of construction, after layout, and shall be reviewed by an engineer.
	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. ➢ 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 and heritage resources.	➢ Assess archaeological significance in areas undisturbed by previous activities. Stage 1 & 2 Land Archaeological Assessment was completed, and the site was deemed at low risk for archaeological discoveries. Follow mitigative measures outlined in cooperation with the Ministry of Tourism, Culture and Sport. ➢ The MTCS's (now MCM's) "Screening for Impacts to Build Heritage and Cultural Heritage Landscapes" checklist was reviewed. Proposed work is located away from any built heritage and cultural heritage landscapes, and thus is not expected to impact heritage resources in the area.
Use of construction equipment	Contamination of surface waters, drains and public roadways from spills, leaks or equipment refuelling.	➢ 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.
	Disruption to wildlife migration and movement patterns, breeding, nesting, or hibernation.	➢ There are no known areas containing sensitive vegetation and wildlife. ➢ There are no known areas where migratory birds are breeding.

OPERATION	EFFECT	MITIGATING MEASURES
	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.

6.2 NATURAL ENVIRONMENT IMPACTS AND MITIGATING MEASURES

6.2.1 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 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* 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 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 October 15, 2021, to document existing natural heritage conditions in the site area. Surveys included ELC of vegetation communities, a SAR habitat assessment of terrestrial features, and a fish habitat assessment of the Detroit River shoreline. The natural heritage features that were identified through the background review were confirmed during the field surveying. The artificial shoreline may provide suitable nesting habitat for Barn Swallow. Investigations are recommended to be carried out during the breeding bird season to confirm if Barn Swallows are nesting on the artificial shoreline structure. No impacts to Barn Swallow are expected as a result of the St. Rose Pumping Station installation provided mitigation measures are followed. The natural heritage impact assessment report is included in **Appendix D**.

6.2.2 Protection of Migratory Birds

The Migratory Birds Convention Act, 1995 (MBCA) provides legal protection of migratory birds and their active nests in Canada. The loss of migratory bird nests, eggs and/or nestlings due to tree cutting or other vegetation clearing can be avoided by limiting clearing of vegetation to outside of the general nesting period for migratory birds in this region (C2) as identified by Environment and Climate Change Canada (ECCC) (i.e., between April 1 and August 31). If work must be performed within this window, a survey for active nests or breeding activity should be conducted by a qualified biologist before work commences and additional mitigation measures (e.g., implementation of avoidance distances during construction) implemented, if required.

6.2.3 Wildlife Protection

The installation of silt fencing around the work area will reduce the likelihood of reptiles entering the work area. 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. If a wildlife species must be moved, a person knowledgeable in handling techniques may relocate it to a location that is both safe and suitable.

6.2.4 Protection of Fish and Fish Habitat

In addition to the measures to protect water quality presented in **Table 6.1**, the following measures are recommended to protect fish and fish habitat:

- Avoid in-water work during the restricted activity period for spring spawning fish species in the MNRF's Southern Region (i.e., no in-water work March 15 to July 15).

- The contractor shall monitor the five-day weather forecast on a daily basis to anticipate weather conditions and shall be prepared to leave the site in a stable and secure condition should water levels rise.

- Prior to in stream construction activity, exclude fish from the work areas by implementing a fish removal and relocation plan.

- During dewatering of the in-water work area the dewatering pump inlet must be covered with filter fabric or clear stone. The outlet must discharge to a sediment bag or trap. Discharge from the bag is to be released to a relatively flat vegetated location or if a vegetated location is not available, a flow dissipating structure should be provided.

- Water from dewatering and unwatering operations shall be directed to a sediment control measure and/or a vegetated drainage channel greater than 30 m away from the waterbodies or as far as practical from the top of bank of any waterbody, prior to discharge to the natural environment. Typically, no dewatering shall be sent directly to a sewer. These control measures shall be monitored for effectiveness and maintained or revised to meet the objective of reducing the risk of the entry of sediment into the watercourse. The use of these dewatering systems will require the acquisition of a Permit to Take Water (PTTW) or Environmental Activity and Sector Registry (EASR) from the MECP as outlined in **Section 6.2.10**.

- All water intakes used to dewater area(s) that may contain fish should be screened to reduce the risk of the impingement and entrainment of fish as per DFO's Interim Code of Practice: End-of-Pipe Fish Protection Screens for Small Water Intakes in Freshwater.

6.2.5 EROSION AND SEDIMENT CONTROL

Appropriate erosion and sediment controls should be employed during all phases of construction to reduce erosion and sediment transport into the Detroit River to the extent possible. Mitigation measures to reduce the risk of negative effects on fish, fish habitat and water quality in the Detroit River are listed below:

- Silt fence will be installed around the perimeter of the work area.

- Materials requiring stockpiling (fill, topsoil, etc.) will be stabilized and kept at least 30 m from the Detroit River.
- Disturbed areas are to be restored with erosion protection/vegetative cover following disturbance.
- Erosion and sediment control materials (silt fence, straw bales, clear stone) are to be kept on site for emergencies and repairs.
- Erosion and sediment controls should be monitored and maintained, as required. Controls are to be removed only after the soils of the construction area have been stabilized and adequately protected until cover is re-established.
- Conditions of the anticipated Essex Regional Conservation Authority (ERCA) permit under Ontario Regulation (O. Reg.) 158/06 will be followed during these activities (see Section 8.1 of the Natural Heritage Impact Assessment Report in **Appendix D**).

6.2.6 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.

6.2.7 FLOODPLAIN HAZARD MANAGEMENT

The proposed work site is under the jurisdiction of the ERCA. The preferred location of this project was reviewed in accordance with ERCA's floodplain mapping of this area, and it has been determined that this site falls within the Limit of Regulated Area of the Detroit River. The proposed excavations, construction of structures, drain crossings, and placement and grading of fill within the regulated area will require permits from the ERCA under Ontario Regulation 158/06, (Development, Interference with Wetlands and Alteration to Shorelines and Watercourse Regulations - Section 28 of the Conservation Authorities Act).

In the final design phase, an application of flood proofing measures must be submitted to the ERCA for review and approval. The permit application shall meet the following requirements:

- Specific "Best Management Practices" regarding erosion control measures, sedimentation, and the removal of vegetation, which is provided in the MECP Stormwater Management Planning and Design Manual (2003)

- The Windsor-Essex Region Stormwater Management Standards Manual (2018), https://essexregionconservation.ca/wp-content/uploads/2018/12/WE-Region-SWM-Standards-Manual.pdf

- Water quality measures shall be considered to ensure no adverse impact on the downstream watercourse. The new outfall sewer will run parallel to the existing outfall sewer that is located along the St. Rose paved walkway, and outlets to the Detroit River. A surface water monitoring program is to be implemented to verify that there is no adverse impact on the downstream watercourse.

- Items listed in **Table 6.1** "Environmental Effect and Mitigation Measures" described in this ESR Report

6.2.8 SURFACE WATER QUALITY

The proposed sampling and monitoring program detailed below should be further developed during the detailed design phase and submitted to the MECP District Office for review prior to implementation.

6.2.8.1 General Approach

The pumping station discharges to the Detroit River via the proposed outfall. The water quality and benthic macroinvertebrate survey of the Detroit River is to be implemented for the proposed outfall.

- The "before" monitoring to establish the baseline shall be completed during the autumn or spring period prior to starting construction of the proposed pumping station; and

- The "after" monitoring would occur once in the same season after the outfall has been operational for at least a year.

The "before" monitoring provides baseline benthic community information in the vicinity of the proposed pumping station to which subsequent "after" monitoring data can be compared.

The surface water quality program is proposed to be comparable to that which has been collected in the vicinity in previous studies.

6.2.8.2 Sampling Locations

Field samples are to be collected at the following two locations organized as paired upstream reference and downstream exposure stations at the proposed pumping station:

- Detroit River, upstream of the proposed outfall, and
- Detroit River, downstream of the proposed outfall.

Sampling locations are to be chosen in an effort to minimize variation in habitat between paired stations. Riffle habitats with cobble, gravel, and sand substrates and moderate to fast water velocity are to be targeted for each sampling station.

6.2.8.3 Water Quality Sampling and Analysis

The surface water sampling is to be performed in conjunction with benthic macroinvertebrate sampling. Grab samples are to be sent for laboratory analysis of parameters of interest and in-situ measurements of temperature, pH, conductivity, and DO are also to be taken.

The water quality parameters include TSS, TP, anions (including NO2, NO3, PO4), and Ammonia-N. Laboratory results are to be summarized and analyzed to generate 75th percentile concentrations for water quality parameters of interest.

6.2.8.4 Benthic Macroinvertebrate Sampling

Quantitative benthic macroinvertebrate samples are to be collected from the Detroit River using a standard PONAR sampler (9x9 inches). Three samples are to be collected at each site both before and after the construction of the new outfall sewer. If the bottom is difficult to sample, then 5 samples are to be collected at each site to compensate for the reduced abundance of macroinvertebrates, or 2-3 samples should be composited into a single sample and 3 composite samples collected at each site.

The following supporting measurements and observations are to be made at each of the benthic sampling stations: pH, dissolved oxygen, conductivity, water and air temperature, water depth, and water velocity. Substrate and aquatic habitat characteristics are to be recorded.

6.2.8.5 Laboratory Methods and Taxonomy for Benthic Macroinvertebrate Survey

The sorting and identification of benthic macroinvertebrates is to be conducted in a benthic taxonomy laboratory. Samples are to be stained with Eosin-B and Biebrich Scarlet. Staining facilitates sort by preferentially staining the organisms so they can be more easily distinguished from the sample debris. The samples are to be washed in a 500 µm sieve to remove formalin and the remaining sample material is to be washed from the sieve into a plastic gridded sorting tray. Organisms are to be sorted from the tray using a 10 - 40x stereomicroscope.

All macroinvertebrates are to be identified to the lowest practical level, usually genus. Chironomids and oligochaetes are to be mounted on glass slides in a clearing medium prior to identification. Following detailed identification, organisms are to be re-preserved in a solution of 70 to 80% ethanol in glass vials and labeled by station, replicate and contents. Data are to be tabulated in an Excel spreadsheet to facilitate analysis and interpretation.

6.2.8.6 Data Analysis of Benthic Macroinvertebrate

Each sample may contain hundreds of individuals and numerous different taxa, therefore, biotic indices that incorporate various community attributes are to be used to compare benthic communities both spatially (between stations) and temporally (within stations over time). The following community measures and indices are to be used to interpret the benthic macroinvertebrate data for this survey.

- Organism density;
- Taxa richness;
- EPT Index;
- BioMAP Water Quality Index;
- Hilsenhoff Biotic Index; and
- Relative abundance of selected taxonomic groups.

The macroinvertebrates are to be identified to the lowest taxonomic level as proposed. A BACI statistical design is to be used to analyze all metrics (e.g., abundance, richness, BioMAP score, HBI, BC similarity).

6.2.9 SOURCE WATER PROTECTION

6.2.9.1 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.

6.2.9.2 Intake Protection Zones (IPZs)

There are two municipal Water Treatment Plants (WTPs) in the region, the A. H. Weeks (Windsor) and Amherstburg WTPs, having their intakes in the Detroit River (refer to Map 3 of the Essex Region Source Protection Plan). 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 metres 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 Approved Source Protection Plan for Essex region source protection area, the Detroit River in the study area is characterized to be an Intake Protection Zone 3 (IPZ-3) (Refer to Map 10 of the Essex Region Source Protection Plan).

The purpose of this EA study is to investigate and report on alternative means of controlling storm and coastal flooding in the riverfront area near St. Rose Avenue. The proposed pumping station for the collection of wet weather flow will have a negligible impact on the source of drinking water quality.

6.2.9.3 Wellhead Protection Areas

Wellhead Protection Areas are not applicable in the Essex Region, as no municipal drinking water systems are supplied by groundwater.

6.2.9.4 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 Essex Region Source Protection Area (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 Map 4 of the Essex Region Source Protection Plan). There are no HVAs located in or close to the proposed work area.

6.2.9.5 Significant Groundwater Recharge Areas

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 located in the sandy soil areas of the southern part of the Essex Region, in the Harrow area, parts of Leamington and Kingsville, and limited parts of the Turkey Creek and Pelee Island subwatersheds (refer to Map 5 of the Essex Region Source Protection Plan). There are no HVAs located in the northern part of the Essex Region including the City of Windsor area.

6.2.9.6 *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 6.2** provides a summary of threats to vulnerable areas and the subsequent actions to be taken, relating to this project.

Table 6.2 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

6.2.10 PERMITS TO TAKE WATER

At the site location, the Detroit River water surface is approximately 0.9 to 1.1 meter below the site grade while the ground water table is about 12.5m to 14.1m below. This indicates that the native silty clay soil has low permeability and ground water control will not be a big issue during construction. It is anticipated that any groundwater inflows from excavating within this stratum during construction can be managed by pumping from properly filtered sumps located within the excavation.

The use of these dewatering systems will require the acquisition of a PTTW 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.

6.2.11 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 emissions 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 Environment Canada weather station located at Windsor Airport has been monitoring and recording weather data since 1941. 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 City of Windsor 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 storm and coastal flooding control continues to operate effectively in the future. A solution needs to be identified to provide resiliency to the impacts of climate change.

The City's own Climate Change Adaptation Plan notes that focus needs to be directed towards climate change impacts such as: operating/maintenance demands to deal with climate extremes, flooding to basements, roads and infrastructure, and operation demands during severe storms. **Table 6.3**, which is obtained from City of Windsor Climate Change Adaption Plan (September 2012), summarizes the average trends in the amount of annual maximum rain events.

Table 6.3 Summary of the Observed and Projected Increases in Rainfall Over Time in Windsor

	Observed Trends 1970 – 2000	**Projected trends to 2050 (High Emissions)**
30 Minute Extremes	• 5% increase per decade • 4.5% increase per decade to 1996	• 5% increase per decade
Daily Extremes	• 7% per decade (May, June, July) • 5% increase per decade (over the year) to 1996	• 3% per decade over the year (20-year return period) • 2.5 to 6% increase per decade (rainfall with probability <5 %)
Annual Rainfall	• 1% to 3% increase per decade	• 1% increase per decade

In conjunction with the regional municipalities, including City of Windsor, the ERCA has developed a set of regional stormwater management guidelines that take into account adjustments for the impacts of Climate Change. The recommendations from this guidance document have also been considered and endorsed in the SMP.

The proposed work for storm and coastal flooding control, which was coordinated with the above studies, was recommended based on current standards with a conservative design method that provides a safety margin for extreme rainfall events above and beyond the average year design storms. The proposed facility is designed to handle a peak flow of 13.5 m^3/s, which is approximately the predicted flow during the 100-year storm event.

As there is an increase in the number and intensity of storm events affecting the region, climate change needs to be considered in the evaluation of alternative solutions, and the opportunity for flooding protection is considered where feasible.

6.3 SOCIO-ECONOMIC IMPACTS AND MITIGATING MEASURES

6.3.1 ARCHAEOLOGICAL RESOURCES

In Phase 5 Implementation of this project, should previously undocumented archaeological resources be discovered, there may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*. If any further archaeological field investigation is required, as identified above, the City will engage with all indigenous communities that have been engaged with to date, and will facilitate the participation in archaeological field work (if applicable) via a Fieldwork Participation Agreement.

The Funeral, Burial and *Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must 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.*

6.3.2 COMMUNITY

6.3.2.1 Disruption of Traffic

Construction of the proposed facility will result in temporary detours or lane restrictions that will disrupt traffic in the area and may interfere with access for some residents. 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.

Mitigating measures are to provide and maintain detours, provide for safe alternate routes, and select alternate routes to minimize inconvenience.

6.3.2.2 Inconvenience During Construction

Construction activities will create noise and traffic from construction vehicles resulting in temporary inconvenience to residents. Coordinate with other construction projects in the neighbourhood to minimize disruptions to adjacent properties, buildings, and residents.

The best available construction techniques shall be applied to the construction to mitigate noise and vibration. The noise and vibration limits set for the project will ensure that the community, all buildings are protected. Monitoring during construction will ensure that noise and vibration are kept below the limit established by the MECP.

6.3.2.3 Proximity to Existing Dwellings

Since the pumping station is buried and flushed clean after storm events it does not give off a significant odour and should not be subject to the 300 m buffer zone requirement.

The design of outdoor lighting on the site would be dictated by the site plan control requirements at the City of Windsor and determined during the detailed design phase of this project. Options for controlled lighting including incorporating full cut-off lighting where practical should be evaluated.

The impact of noise and vibration sources at the proposed St. Rose Pumping Station should be evaluated and quantified during the implementation phase (detailed design and construction). A detailed noise study should be performed to assess all potential noise sources such as the on-site emergency generator, including its individual noise generating components such as the exhaust, casing noise, and cooling intake and discharge. Other noise sources such as heating, ventilation, and air conditioning (HVAC) units, pumps, and general exhausts should also be considered in the assessment.

The assessment should be completed in accordance with the following MECP publications:

- Ontario Regulation (O.Reg.) 1/17 "*Environmental Activity and Sector Registry – Limits and Other Requirements for Activities with Air Emissions*," September 2017 [1]
- MECP "*Supporting Information for the Preparation of an Acoustic Assessment Report*, November 2003" [2].

Noise impacts should be modelled using CADNA/A or similar acoustical modelling software configured to implement the ISO 9613-1/2 environmental sound propagation algorithms.

Modelling software should consider geometrical divergence, attenuation from barriers, ground effect and air absorption as specified by ISO 9613-2.

In the case that on-site equipment is exempt from noise criteria per MECP publications, Class 1 noise limits should be applied as criteria for evaluating the noise impact of on-site sources. A Class 1 area is defined by the MECP as an area with an acoustical environment typical of a major population center, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as "urban hum". Class 1 sound level limits are summarized in the following table:

Table 6.4 Summary of Class 1 Sound Level Limits

Time of Day	Plane-of-Window (POW) [dBA]	Outdoor Points-of-Reception (OPOR) [dBA]
07:00-19:00	50	50
19:00-23:00	50	50
23:00-07:00	45	-

If required, noise mitigation should be identified per noise source. Insertion loss (IL) or transmission loss (TL) should be specified for all recommended noise mitigation.

6.3.2.4 Proximity to Arterial Roadway

The EC Row Expressway and Highway 401 are the two major roadways, which provide interconnection and access to Windsor communities and neighboring areas. These roads are located significantly far away from the proposed pumping station. Wyandotte Street East is located one block south of the proposed pumping station and is designated as a Class I Arterial Road. The construction of the proposed pumping station is not expected to result in the closure of Wyandotte Street East; therefore, it is not expected that there will be any significant traffic disruptions during construction.

6.4 PERMITTING CONSIDERATION

6.4.1 ESSEX REGION CONSERVATION AUTHORITY

The proposed pumping station is located in the Essex Region Conservation Authority (ERCA) regulated area related to the Detroit River and its associated floodplain. As such, development in the ERCA regulated area is subject to the policies of O. Reg. 158/06 under the Conservation Authorities Act.

6.4.2 MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS

The Endangered Species Act, 2007 (ESA) identifies a single species at risk, Barn Swallow, as having potential to occur within the study area, however, there is a low likelihood of occurrence because there are no recent records, and the area is heavily disturbed. Avoidance of the migratory bird nesting season (April 1 - August 31) is recommended. If this is not possible, then bird nesting surveys must be completed in advance of construction. With the implementation of this mitigation, no authorizations are needed under the ESA. It is the responsibility of the proponent to ensure that Species at Risk 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.

The use of these dewatering systems will require approval from the MECP and acquisition of a PTTW, refer to **Section 6.2.10** for additional details.

There is currently no ECA for the proposed St. Rose Pumping Station. In Phase 5 implementation of this project, the proponent will consult further with the MECP Environmental Permissions Branch regarding potential ECA requirements. Should the ECA be required, the proponent will obtain the ECA prior to starting the construction of the proposed pumping station.

6.4.3 FISHERIES AND OCEANS CANADA

Fisheries Act and *Species at Risk Act* (SARA) - Under the fish and fish habitat protection provisions of the Fisheries Act, works undertaken or activity of a project must incorporate measures to avoid causing the death of fish and the harmful alteration, disruption, or destruction (HADD) of fish habitat. To assist proponents with determining if their project will comply with the fish and fish habitat provisions, DFO provides measures to protect fish and fish habitat (DFO 2021b) as well as several standards and codes of practice (DFO 2021c). If it is determined that a project cannot implement the measures to protect fish and fish habitat and if there are no applicable standards and codes of practice, then it is recommended that the proponent request a review of the project by DFO. If DFO determines that a project will result in the death of fish and/or HADD of fish habitat an Authorization under the *Fisheries Act* may be required.

Based on the presence of fish habitat in the study area, the proposed activities, and DFO's current guidelines, Stantec recommends that a DFO Request for Review form be completed and submitted to DFO for review of the project under the Fisheries Act. DFO also reviews projects under the federal SARA. A SARA permit may be required by DFO for potential handling of Aquatic SAR during in water construction activities.

6.4.4 City of Windsor – Building Permit

The proposed pumping station is located within the City of Windsor and as such would require a building permit prior to construction. Building permits ensure that construction within our municipality meet the standards set out in the Ontario Building Code. In addition, this permitting process ensures all zoning requirements, fire and structural safety standards, and other building standards are met.

6.5 PROPERTY REQUIREMENTS

6.5.1 General

There is no requirement to purchase land for construction of the pumping station facilities. The lands are owned by the proponent.

6.5.2 Official Plan

A number of provisions found in the s. 8 Urban Design chapter of the Official Plan apply to the lands. These provisions concern views and vistas. The provisions encourage the preservation and enhancement of views to the Detroit River. When preparing the final design plans for the pumping station these provisions will be taken into consideration and addressed at that time.

6.5.3 Zoning By-Law

St. Rose Beach Park is zoned GD1.1 under Zoning By-law 8600. This zoning category permits a Public Park. S.5.8.1 of the zoning by-law further permits lands owned by the municipality to be used for any purpose of the municipality. A pumping station which forms part of municipal infrastructure is therefore a permitted use under the zoning by-law. In addition, the provisions of s.20(1)(3) of the zoning by-law apply to this property. This provision restricts new buildings extending above the crown of the pavement which lies within the adjacent Riverside Drive. It is anticipated that the proposed pumping station will extend above the crown of the pavement on Riverside Drive and therefore a rezoning will be required to address this matter.

7.0 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 consultation during this project.

7.1 PUBLIC PARTICIPATION

A notice of commencement advising of the initiation of this Class EA undertaking and inviting input was originally published in the January 29, 2022, edition of the Windsor Star and on the City of Windsor's Webpage. A copy of the notice and the Windsor Star advertisement is contained in **Appendix C**.

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

- Phase 3: Public Consultation and Information Centre #1
- Phase 3: Public Consultation and Information Centre #2
- Phase 4: Notice of Completion

A public Open House was held on March 2, 2022, to provide information regarding this undertaking and to invite input and comment from interested persons. The open house notice was published in the February 19, 2022, edition of the Windsor Star and on the City of Windsor Webpage. A copy of the notice and the Windsor Star advertisement is contained in **Appendix C** along with a copy of the handout materials that were provided to attendees.

A second public Open House was held on June 23, 2022, to review progress made since the first open house. Information on alternative concepts for the preferred design selected in the Class EA process was available for review. The open house notice was published in the June 11, 2022, edition of the Windsor Star and on the City of Windsor Webpage. A copy of the notice and the Windsor Star advertisement is contained in **Appendix C** along with a copy of the handout materials that were provided to attendees.

7.2 REVIEW AGENCIES

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

An email advising of the initiation of this project and including the notice of project commencement was sent to review agencies on January 28th, 2022. A copy of the email and the list of review agencies included are contained in **Appendix C**.

Information on alternative design concepts for the proposed pumping station as part of Phase 3 of the Class EA process were distributed to review agencies and mandatory contacts in two emails dated February 18th, 2022, and June 10th, 2022. Each email included a copy of the notice of public information centre. A copy of each email and the distribution list is included in **Appendix C**.

7.3 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 advising of the initiation of this project and including the notice of project commencement was sent to owners of properties within a one block radius of St. Rose Beach Park on January 28th, 2022. A copy of the mailout package is contained in **Appendix C**.

Information on alternative design concepts for the proposed St. Rose stormwater pumping station and invitation to public open houses as part of Phase 3 of the Class EA process were distributed to local residents under cover of two letters dated February 22nd, 2022, and June 10th, 2022. Each mailout package included the notice of public information centre and a comment form. A copy of each mailout package is included in **Appendix C**.

7.4 RESPONSE FROM PUBLIC AND REVIEW AGENCIES

7.4.1 NOTICE OF PROJECT COMMENCEMENT

The Notice of Project Commencement resulted in responses from residents displaying an interest in this study and wishing to be added to the project mailing list. Throughout the study a total of nineteen (19) residents were added to the project mailing list.

The following responses (copies included in **Appendix C**) were received from review agencies and mandatory contacts.

- Ministry of the Environment, Conservation, and Parks - advised by email on February 15, 2022, that the proponent should appropriately consult with Aboriginal communities throughout the Class EA process.

- Ministry of Northern Development, Mines, Natural Resources and Forestry – advised in an email dated March 22, 2022, that the Class EA should identify and address potential impacts to natural heritage including species at risk or other resource values.

- Ministry of Tourism, Culture and Sport – advised in an email dated March 2, 2022, that the Class EA should identify and address potential impacts to Archaeological resources, including land-based and marine; built heritage resources, including bridges and monuments; and Cultural heritage landscapes.

- Fisheries and Oceans Canada – advised in an email dated February 22, 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.

- Transport Canada – advised in an email dated February 22, 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 administered by Transport Canada.

- Windsor Port Authority - requested in an email dated January 31, 2022, that the Windsor Port Authority be kept informed of progress of this project.

- Essex Region Conservation Authority – advised in an email dated January 29, 2022, that ERCA has an interest in the project and can provide input on the project.

- Hydro One - advised in an email dated March 3, 2022, that Hydro One has no existing transmission assets within the study area.

- Town of LaSalle - advised in an email dated January 31, 2022, that the Town of LaSalle has an interest in the project and asked to be kept on the mailing list.

- County of Essex - advised in an email dated January 30, 2022, that the County of Essex has an interest in the project and asked to be kept on the mailing list.

7.4.2 PUBLIC OPEN HOUSE # 1

A total of nineteen (19) people attended the Open House held on March 2, 2022.

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

- ERCA - advised in a letter dated March 17, 2022, that
    - The study area is regulated, by the Conservation Authority, under Section 28 of the Conservation Authorities Act. In addition, there is very little by way of natural heritage that, should be affected by the works proposed for the new pumping station in the study area, except for the Fisheries Act, if in-water works are proposed.
    - For the new pumping station, early consultation with the ERCA, at the detailed design stage, is encouraged to obtain feedback on the recommended / preferred design. This is to ensure environmental impacts are avoided and to discuss the specific permitting requirements for this project, including other agency approvals.

In addition, a total of twelve (12) feedback forms were received from residents in response to the information provided at the Public Open House. The City of Windsor provided written letters in response to the resident's comments and concerns. Copies of the feedback forms and City responses are included in **Appendix C**.

7.4.3 PUBLIC OPEN HOUSE # 2

A total of ten (10) people attended the Open House held on June 23, 2022.

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

- Windsor Police Services - advised in an email dated June 10, 2022, that
    - This project does not have a significant impact on either public safety and security in general or the operations of the Windsor Police Service.
    - The preferred site option would carry the least number of problematic consequences, post construction, compared to the other site options. This is because it has the greatest amount of physical separation space from nearby residential land uses, the result from which minimizes concerns of noise, trespassing, suspicious behavior, etc.

- The preferred option being put forth is therefore supported by the Windsor Police Services as being the one most likely to have the fewest problems, once constructed and in operation.

In addition, a total of four (4) feedback forms were received from residents in response to the information provided at the Public Open House. The City of Windsor provided a written letter in response to the resident's comments and concerns. A copy of the feedback forms and City responses are included in **Appendix C**.

7.4.4 DRAFT ENVIRONMENTAL STUDY REPORT

An email advising of the completion of a Draft ESR for this project was sent to review agencies on February 23rd, 2023. A copy of the notification email is contained in **Appendix C**. The email included a link to a temporary file sharing service where the Draft ESR and Appendices could be downloaded. Comments were received from the following review agencies.

- Telus (Telecon) - advised in an email dated February 24, 2023, that Telus has no existing infrastructure in the area of the proposed work.
- Windsor Police Services - advised in an email dated February 24, 2023, that
  - This results from this study are not anticipated to carry any significant impact to public safety in a way that is overtly discernible.
  - The primary issue, while low in overall risk probability, is to ensure the property is established and maintained in a way that optimizes physical security. […] In saying this, extra care should be given to solidifying good access control measures into the site, plus implementing important target hardening features such as, but not limited to:
    - High resolution CCTV recording of activity on and around the property, with a minimum image retention capability of 30 days.
    - Use of high security hardware to effectively fortify access into any building structures.
    - Installing a good quality security access control system that can quickly detect the presence of illegal access by unauthorized individuals.
    - Excellent lighting to optimize natural surveillance capability and also facilitate more effective police response if called to the site. Minimum illumination levels would vary according to various parts of the site and would be provided if a final site plan was provided to Windsor Police for review (Recommended). In general, full cut off LED lighting is

recommended that uses fixtures with a colour temperature of 4000 degrees Kelvin (4000K) and a corresponding minimum colour rendering index (CRI) of 70. There may also be areas where motion-activated floodlighting is more appropriate – this can be confirmed during a site plan review.

- It is also important that uninhibited access by all emergency responders (Police, Fire, and EMS) be achieved as an outcome from the final design, when it is constructed and made operational.
- It was noted that the Windsor Police Service will be happy to comment further on this project as it progresses to later stages, most notably the point at which a finalized site plan of all works to be undertaken gets developed.

- Ministry of Citizenship and Multiculturalism (MCM)- advised in a letter dated March 14, 2023, that
  - MCM finds that due diligence has been undertaken in preparing the ESR by:
    - Undertaking a Stage 2 Archaeological Assessment (AA) (under Project Information Form Number P256-0697-2021, included in **Appendix D**) which has been entered into the public register of archaeological reports indicating no further archaeological assessment of the study area is required.
    - Completing the checklist Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes (included in **Appendix D**), which determined that potential is low and therefore no cultural heritage evaluation and/or heritage impact assessment was undertaken.
  - In addition, the MCM provided a table with some comments to support the ESRs documentation of cultural heritage due diligence (see **Appendix C** for more details).
- Ministry of the Environment, Conservation, and Parks – provided comments in a letter dated March 22, 2023. See **Appendix C** for details.

A copy of the feedback forms and City responses are included in **Appendix C**.

7.5 INDIGENOUS CONSULTATION

Consultation with First Nations is ongoing in accordance with the Municipal Class EA Indigenous Consultation requirements. As part of this Environmental Assessment, communications with First Nations agencies and communities are being undertaken in parallel with stakeholder communications and consultations. This report will be sent to Indigenous groups and organizations.

The communities contacted as part of this EA study include:

- 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
- Moravian of the Thames (Delaware Nation)

Documentation of consultation with First Nations communities during the Environmental Assessment Process is in **Appendix C**.

8.0 OPINION OF PROBABLE COST

This section discusses an opinion of probable cost for the recommended design 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.

8.1 LEVEL OF ACCURACY

Opinions of probable cost are commonly provided throughout various stages of a project lifecycle and there are several classifications for these estimates that identify the level of accuracy. These classifications can vary based on the 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 for the opinion of probable cost increases as the project moves from the planning stage to the preliminary design and final design. A wide range of accuracy is expected at the planning stage of a project because a number of details remain unknown. As the project moves closer to completion and final design, the estimate would become more accurate due to the increased level of detail and the reduced number of unknowns.

Table 8.1 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 8.1: 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%	Master Plan or Class EA.
3	Preliminary Estimate	+25% to -10%	Pre-design report.
4	Detailed Estimate	+15% to -5%	Final design report and specifications.
5	Tender Estimate	+10% to -3%	Estimate received from the contractor in response to the Tender.

8.2 OPINION OF PROBABLE COST FOR RECOMMENDED SOLUTION

An Opinion of Probable Cost (OPC) (in 2023 dollars) is summarized in **Table 8.2.** The OPC shown in this table differs from that in the technical memo and PIC presentations because it has been updated based on current construction costs and includes consideration for inflationary pressures. 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 Canadian 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.
- HST is included at 13%.
- Allowances for engineering and contingency allowances (approximately 15% and 10%, respectively) are included in the estimate.
- No allowance is included for interim financing costs or legal costs.
- No allowance is included for escalation or uncertainty in market pricing factors.

- A factor that could impact the estimate is the possible presence of archaeological resources in the construction area. The potential for these resources has been identified to be low and therefore no allowance is included in the estimate.

- The preliminary cost analysis does not include an estimate for the value associated with loss of a portion of the parkland. The loss of parkland will not represent a capital cost expense to the City of Windsor; however, this park does hold a value to the community. It is not possible to produce an accurate estimate of this inherent value; therefore, it is not included in this analysis.

Table 8.2: Opinion of Probable Capital Cost for Recommended Solution

Item	*Description*	*Probable Cost*
1	Pumping Station and all associated accessories	$20,000,000
Sub-total Construction Cost		**$20,000,000**
	Contingency Allowance (10%)	$2,000,000
	Engineering Allowance (15%)	$3,000,000
TOTAL CAPITAL COST (excluding taxes)		**$25,000,000**
	HST (13%)	$3,250,000
TOTAL ANTICIPATED CAPITAL COST (including taxes)		**$28,250,000**

9.0 SUMMARY

This ESR presents a thorough review and evaluation of alternative design concepts for the proposed St. Rose stormwater pumping station. This ESR identified, evaluated, and reported on alternative design concepts including the site location, site layout, pumping technology, and architectural design of the electrical building in order to determine the recommended pumping station design. **Section 5.0** summarizes the decision-making process and outcomes of the analysis for each design concept.

Phase 1 and 2 of the Class EA process for this project was completed as part of the SMP. Through the comprehensive SMP study, a level of service was established to reduce the risk of flooding in vulnerable areas throughout the City. The St. Rose drainage area was identified as one of those vulnerable areas. This area is at high risk for flooding concerns due to its low elevation and close proximity to the Detroit River. The area is currently serviced by a gravity storm sewer outlet; however, it is not able to handle wet weather flows during severe storm events. In the SMP, the City identified a new stormwater pumping station as the recommended design solution to increase the level of service in the St. Rose drainage area and provide increased flood protection in the case of a 1:100-year storm event. In consideration of the comments received through the stakeholder consultation process (during the SMP study), a further in-depth evaluation of the site location was completed and presented in the Technical Memorandum (**Appendix B**). Through the detailed analysis the St. Rose Beach Park was identified as the recommended site for the proposed pumping station based on its ability to satisfy the majority of the evaluation criteria.

During Phase 3 of the Class EA process, alternative pumping technologies, site layouts, and architectural designs of the electrical building, were evaluated to form the overall recommended design. Axial flow pumps are recommended for this stormwater pumping station design based on their high efficiency, low space requirements, and their ability to reduce sightline obstructions. Site layout Alternative No. 3B, which shows the above ground infrastructure near the east side of St. Rose Beach Park, is recommended based on technical suitability, the ability to reduce the sightline obstructions, and provide more undisturbed greenspace. Architectural design alternative No. 3, which features a modern residential architectural style with limestone façade, faux windows, and mansard roof, is proposed based on the existing residential homes surrounding the park. The buildings for the pumping station are to be designed to blend in with the built and cultural heritage of the neighbourhood.

Phase 4 of the Class EA process included documenting the planning, design, and consultation activities that outline the decision-making process for the project in this ESR. The recommended design meets the requirements outlined in the SMP which is to reduce the risk of flooding in the St. Rose drainage area during severe storm events. When capital budget funding becomes available, it is recommended that the work described in this ESR proceed to Phase 5 with detailed design and construction. Construction of the proposed infrastructure will increase the resiliency to flooding in this area and positively impact the community by protecting property including municipal infrastructure, local transportation networks, and residential properties.

APPENDICES

DRAFT

APPENDIX A: FIGURES

Figure 1.1: Existing St. Rose Drainage Area

Figure 1.2: Proposed St. Rose Drainage Area

Figure 1.3: Municipal Class EA Planning and Design Process

Figure 2.1: Archaeological Potential in the City of Windsor Area

Figure 5.1B: Site Layout Alternative No. 1

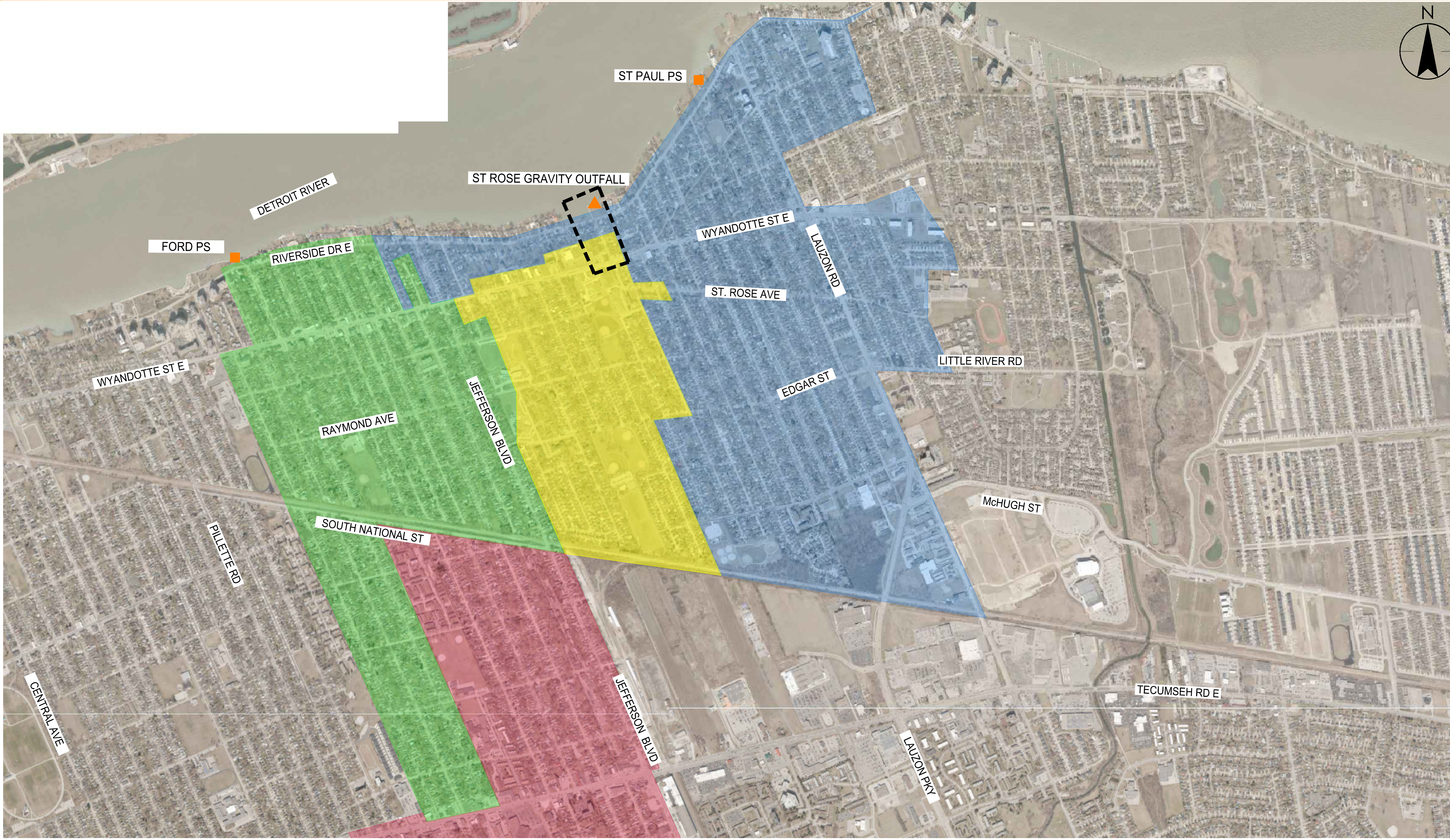
Figure 5.2B: Site Layout Alternative No. 2

Figure 5.3B: Site Layout Alternative No. 3A

Figure 5.4B: Site Layout Alternative No. 3B and Recommended Site Layout

Figure 5.8: Preliminary Pumping Station Plan and Sections

Figure 5.9: Preliminary Hydraulic Profile



Corporation of the County of Essex 2021

LEGEND

- ST PAUL PS DRAINAGE AREA
- ST ROSE GRAVITY OUTFALL DRAINAGE AREA
- FORD BLVD. PS DRAINAGE AREA
- COMBINED SEWER DRAINAGE AREA
- PUMP STATION
- GRAVITY OUTFALL
- STUDY AREA

Stantec

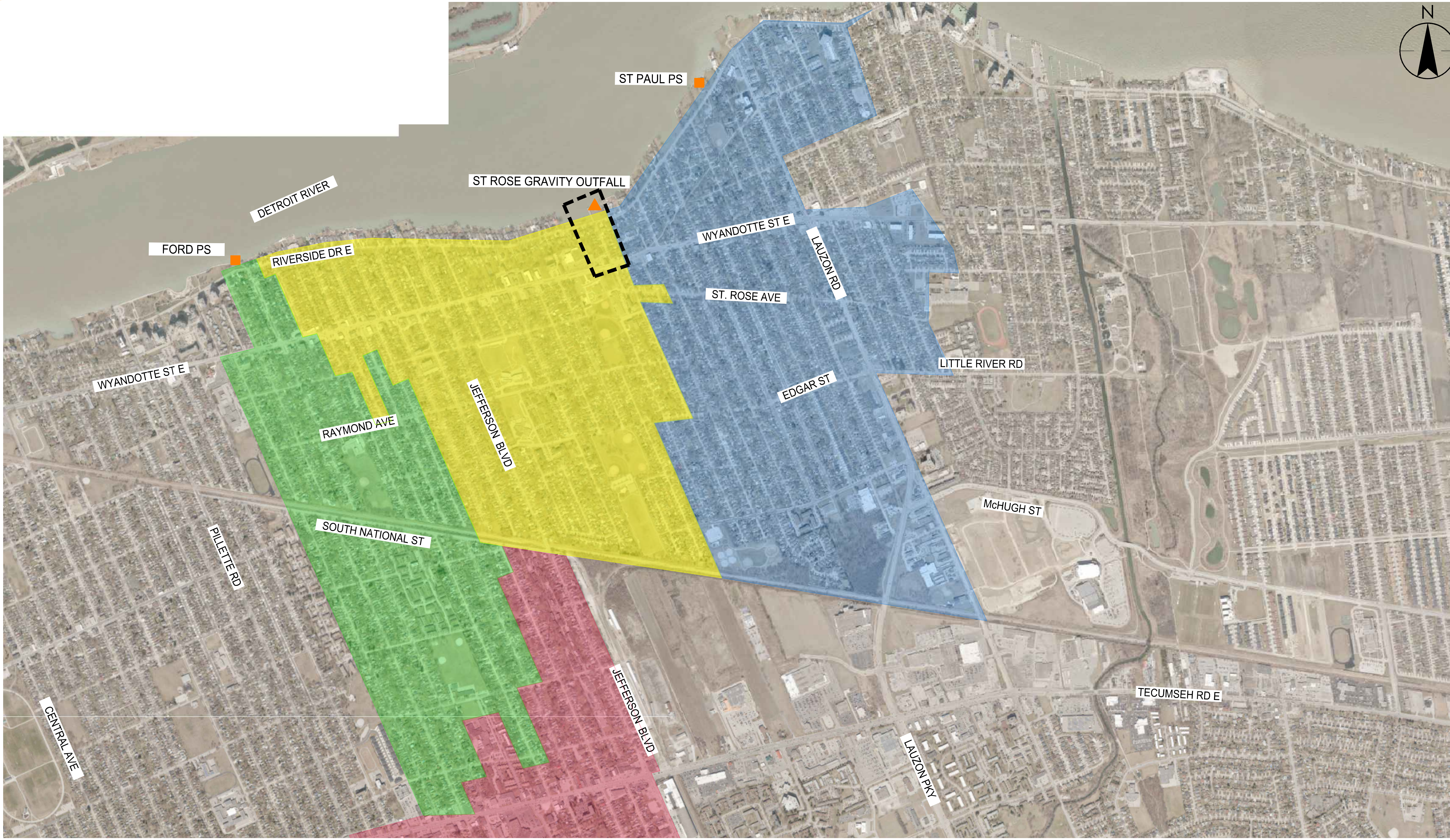
CITY OF WINDSOR
ST. ROSE PUMPING STATION CLASS EA

EXISTING ST ROSE DRAINAGE AREA

PROJECT NO. 165620239

DRAWING NO. FIGURE 1.1

\\cd1223-f01\work_group\01656\active\165620239\design\drawing\civil\165620239_FIG1.1.dwg
2022-2-15 04:14pm BY: kfox



Corporation of the County of Essex 2021

LEGEND

	ST PAUL PS DRAINAGE AREA
	ST ROSE GRAVITY OUTFALL DRAINAGE AREA
	FORD BLVD. PS DRAINAGE AREA
	COMBINED SEWER DRAINAGE AREA
■	PUMP STATION
▲	GRAVITY OUTFALL
- - -	STUDY AREA

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CITY OF WINDSOR
ST. ROSE PUMPING STATION CLASS EA

PROPOSED ST ROSE DRAINAGE AREA

PROJECT NO. 165620239

DRAWING NO. FIGURE 1.2

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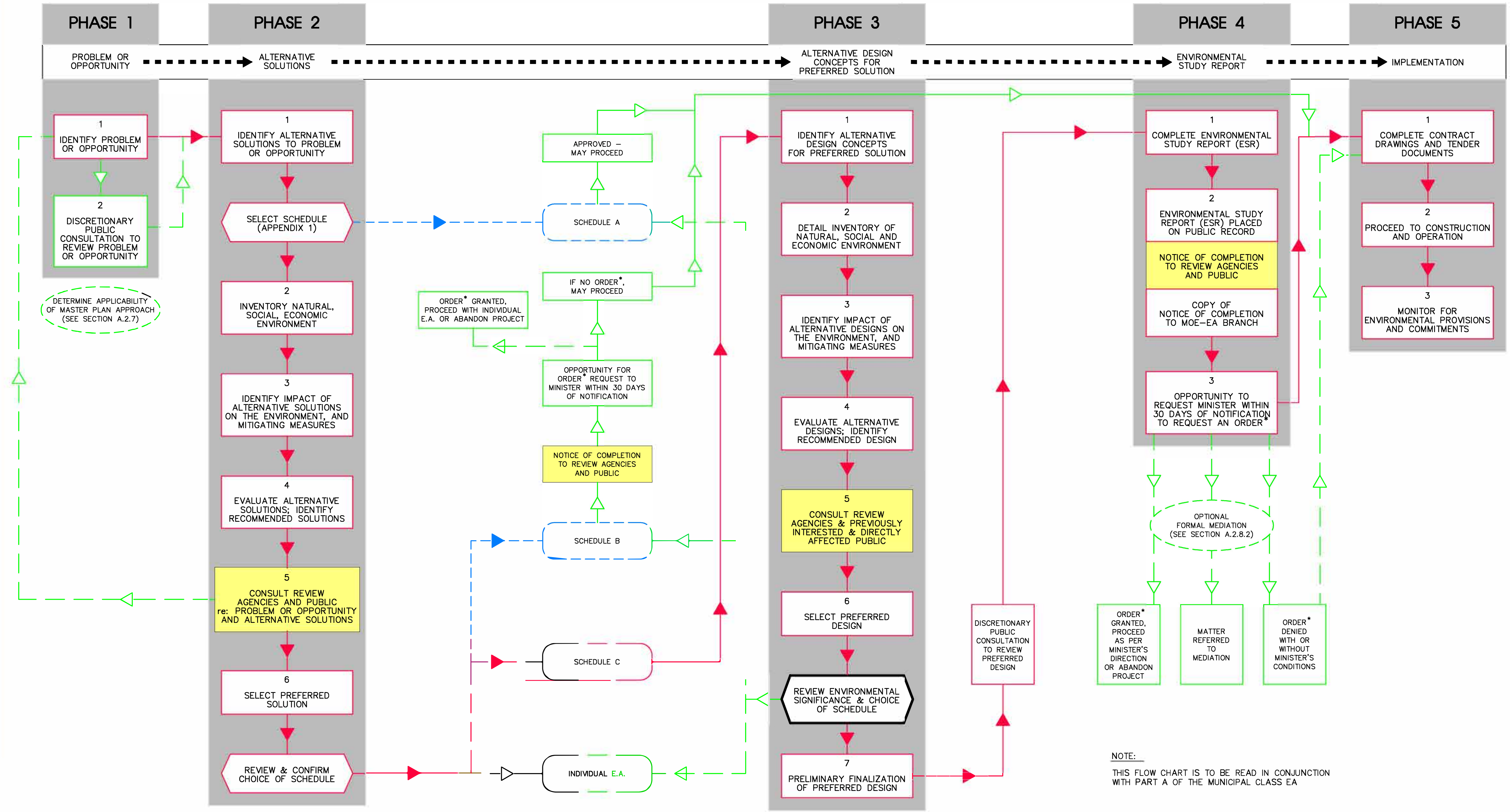


NOTE:
THIS FLOW CHART IS TO BE READ IN CONJUNCTION WITH PART A OF THE MUNICIPAL CLASS EA

INDICATES MANDATORY EVENTS
INDICATES POSSIBLE EVENTS
INDICATES PROBABLE EVENTS
MANDATORY PUBLIC CONTACT POINTS (SEE SECTION A.3 CONSULTATION)
DECISION POINTS ON CHOICE OF SCHEDULE
OPTIONAL
* PART II ORDER (SEE SECTION A.2.8)

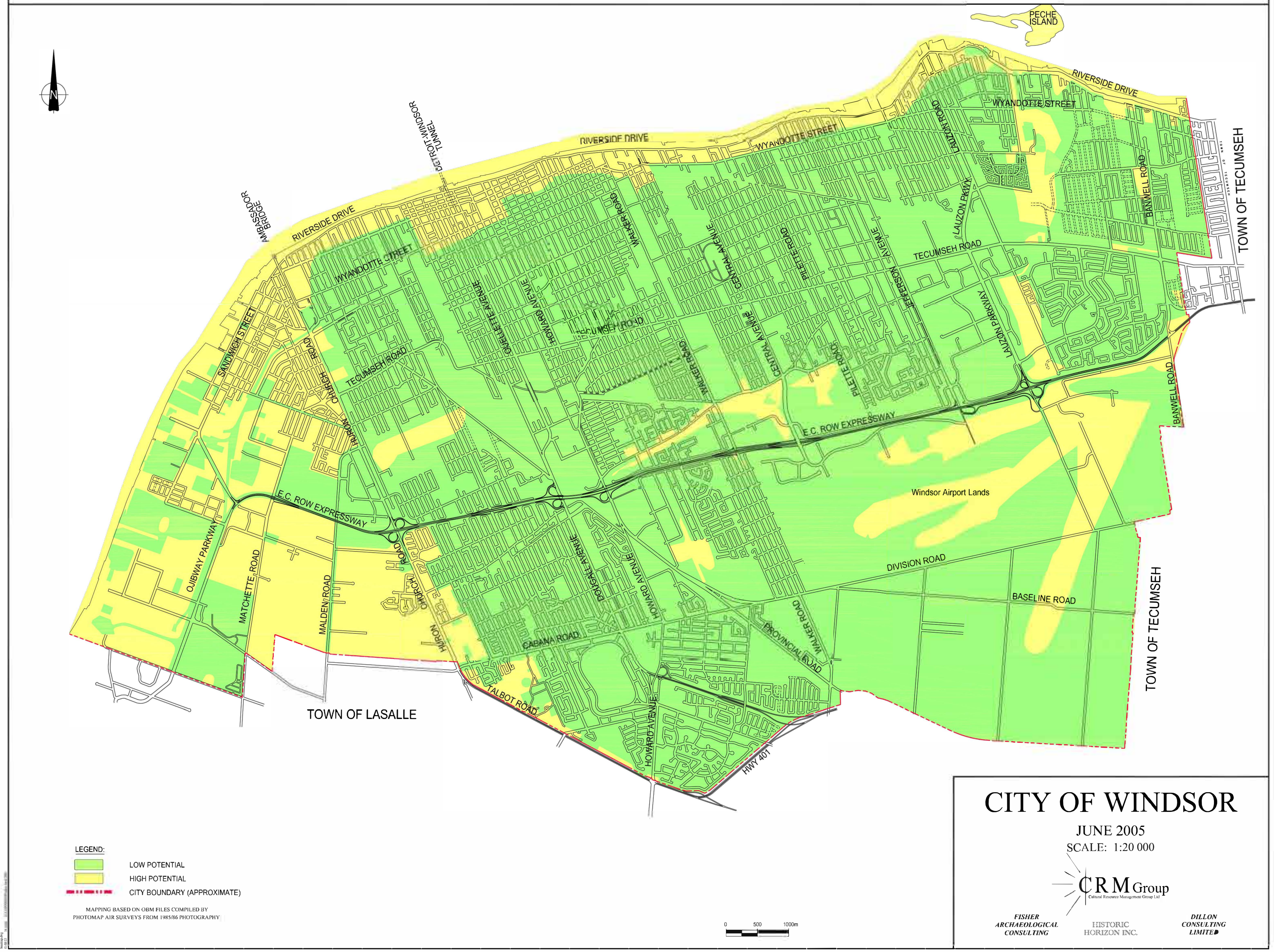
Stantec

CITY OF WINDSOR
ST. ROSE PUMPING STATION CLASS EA

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

PROJECT NO.	DRAWING NO.
165620239	FIGURE 1.3

WINDSOR ARCHAEOLOGICAL MASTER PLAN: FIGURE 4.0 - ARCHAEOLOGICAL POTENTIAL



Stantec

CITY OF WINDSOR
ST. ROSE PUMPING STATION CLASS EA

ARCHAEOLOGICAL POTENTIAL IN THE CITY OF WINDSOR AREA

PROJECT NO.	DRAWING NO.
165620132	FIGURE 2.1

AERIAL PLAN
SCALE: 1:250

Stantec

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100-2555 Ouellette Avenue
Windsor ON Canada N8X 1L9
Tel: 519.966.2250
www.stantec.com

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Legend

Notes

Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD
1			

File Name: 165620239_SW-201	Q.K.	J.L.	J.L.	2021.09.14
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit/Seal

PRELIMINARY NOT FOR CONSTRUCTION

Not for permits, pricing or other official purposes. This document has not been completed or checked and is for general information or comment only.

Client/Project
CORPORATION OF THE CITY OF WINDSOR
ST. ROSE STORM WATER PUMPING STATION

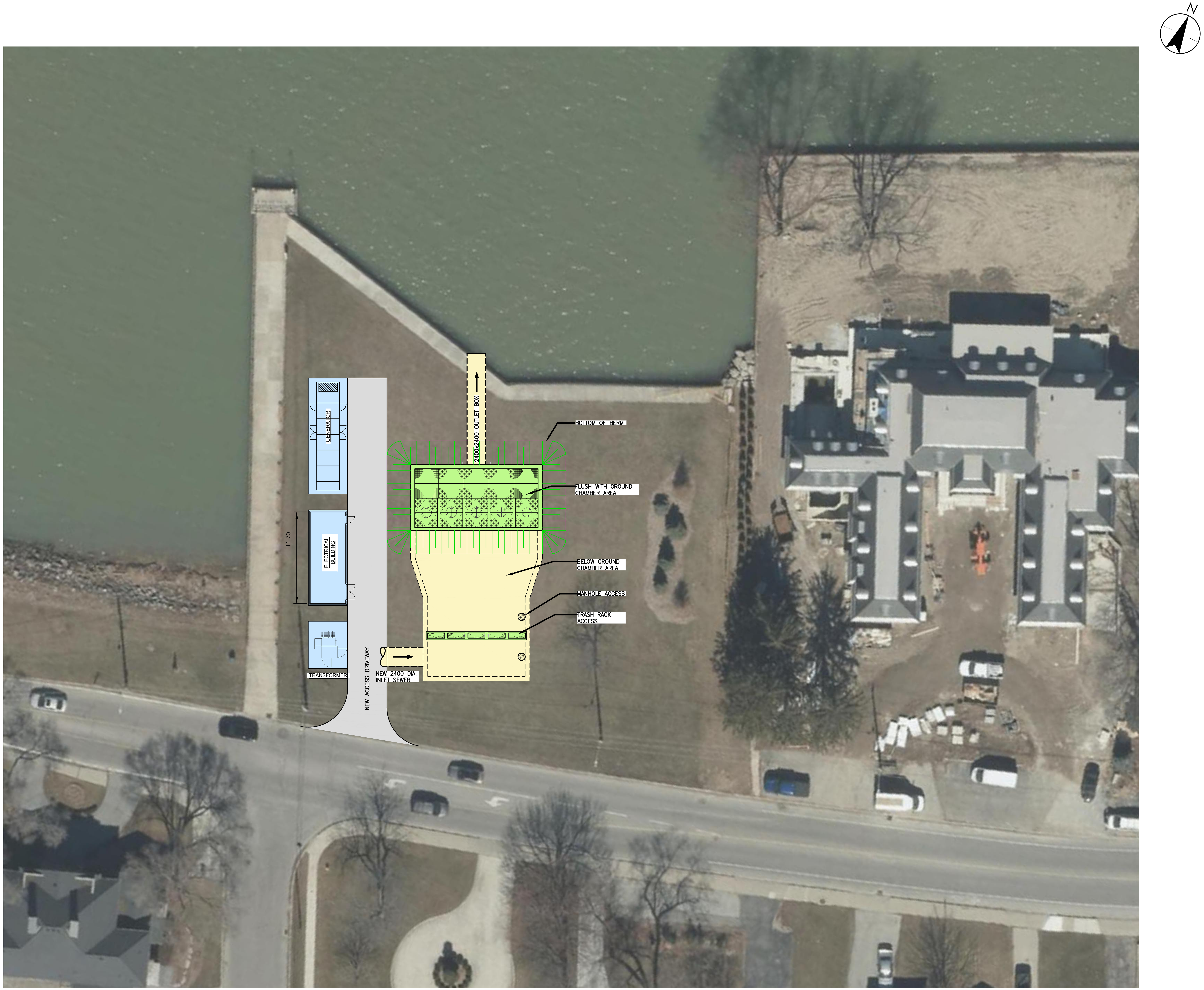
NEW PUMPING STATION

City of Windsor, Ontario

Title
Site Layout No. 1

Project No. 165620239
Scale AS SHOWN
Revision Sheet
Drawing No.

Figure 5.1B



AERIAL PLAN

SCALE: 1:250

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CORPORATION OF THE CITY OF WINDSOR
ST. ROSE STORM WATER PUMPING STATION

NEW PUMPING STATION

City of Windsor, Ontario

Title

Site Layout No. 2

Project No.
165620239

Scale
AS SHOWN

Revision Sheet

Drawing No.

Figure 5.2B

AERIAL PLAN
SCALE: 1:250

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NEW PUMPING STATION

City of Windsor, Ontario

Title

Site Layout No. 3A

Project No. 165620239

Scale AS SHOWN

Revision Sheet

Drawing No.

Figure 5.3B

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AERIAL PLAN

SCALE: 1:250

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NEW PUMPING STATION

City of Windsor, Ontario

Title

Site Layout No. 3B & Recommended Site Layout

Project No. 165620239

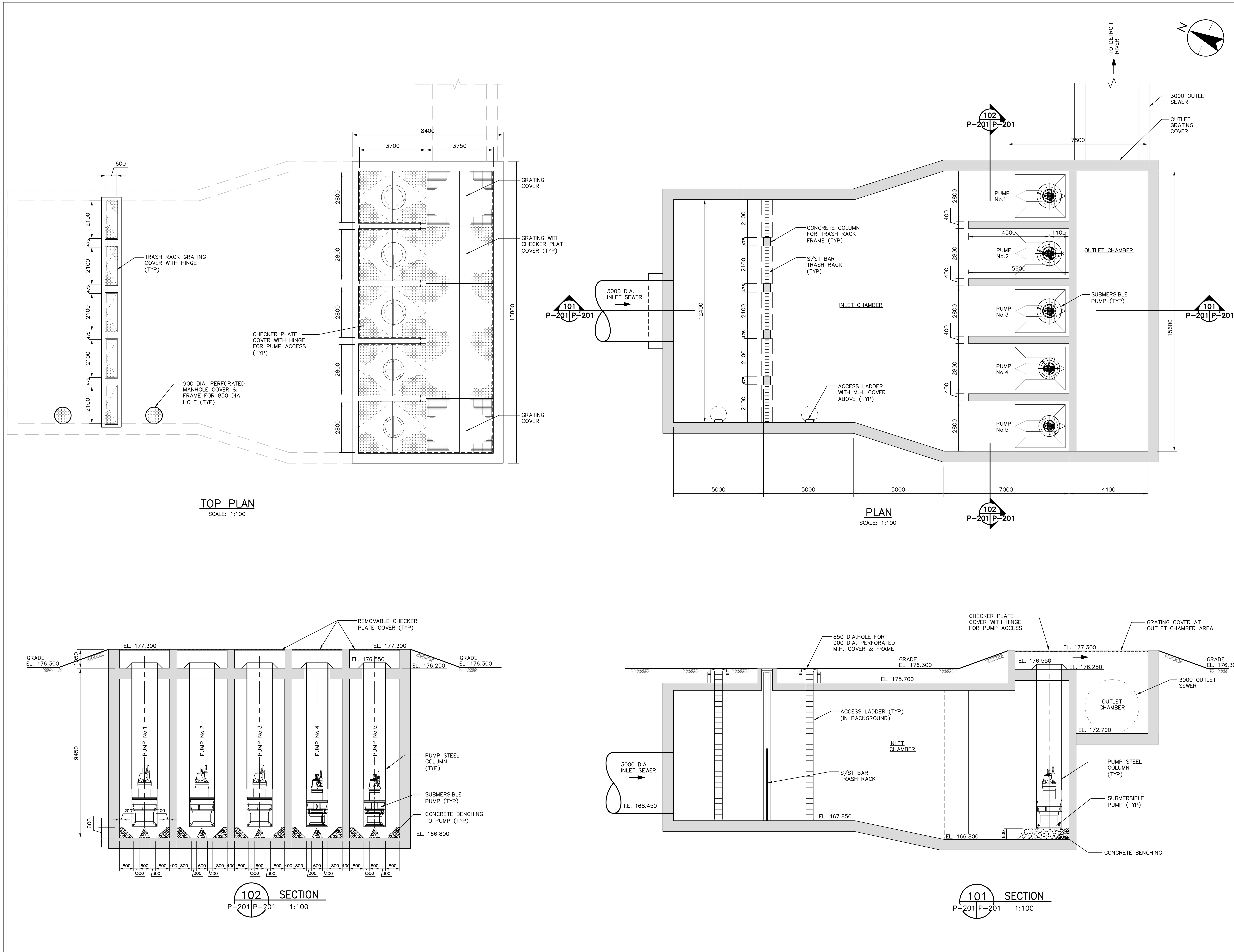
Scale AS SHOWN

Revision

Sheet

Drawing No.

Figure 5.4B



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CORPORATION OF THE CITY OF WINDSOR
ST. ROSE STORM WATER PUMPING STATION

NEW PUMPING STATION

City of Windsor, Ontario

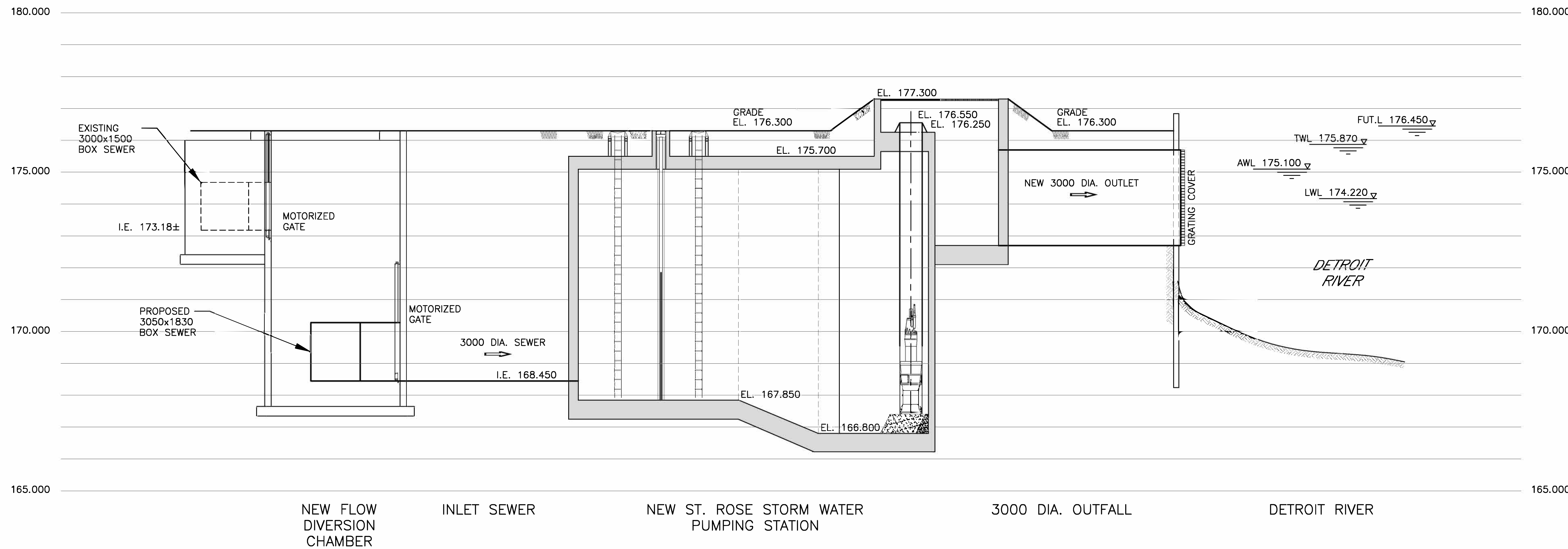
Title

NEW PUMPING STATION
PLAN AND SECTIONS

Project No.	Scale
165620239	AS SHOWN

Revision Sheet Drawing No.

Figure 5.8



NOTE: ALL SEWER AND PUMPING STATION DIMENSIONS, LOCATION AND ELEVATIONS ARE OBTAINED FROM CITY SEWER ATLAS AND SEWER AND COASTAL FLOOD PROTECTION MASTER PLAN (2020).
EXACT DIMENSIONS AND ELEVATIONS SHALL BE FURTHER REVIEWED DURING DETAIL DESIGN.

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CORPORATION OF THE CITY OF WINDSOR
ST. ROSE STORM WATER PUMPING STATION

NEW PUMPING STATION

City of Windsor, Ontario

Title

HYDRAULIC PROFILE

Project No. 165620239

Scale 1:150H 1:75V (0, 1.5, 4.5, 7.5m; 0, 0.75, 2.25, 3.75m)

Revision Sheet Drawing No.

Figure 5.9

APPENDIX B: TECHNICAL MEMORANDUM

Phase 3: Technical Memorandum 'Comparative Evaluation of Site Location'

Stantec

Stantec Consulting Ltd.
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Note for the Technical Memo

Prepared for: City of Windsor
Prepared by: Stantec Consulting Ltd.
Project/File: 165620239
Date: February 2023

The Technical Memorandum (below) entitled 'St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment – Schedule 'C' – Comparative Evaluation of Site Location' dated May 2022 is to be read in conjunction with the St. Rose Stormwater Pumping Station Environmental Study Report.

ST. ROSE STORMWATER PUMPING STATION – AMENDMENTS TO THE TECHNICAL MEMORANDUM

To address widespread flooding concerns, the City of Windsor (City) completed a comprehensive study known as the Sewer & Coastal Flood Protection Master Plan (SMP) in July 2020. The SMP identified the need for a new stormwater pumping station to service the St. Rose drainage area. In January 2022, the City commenced a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the proposed St. Rose stormwater pumping station. This study is to satisfy Phases 3 and 4 of the Class EA process and include evaluation of alternative design concepts for the proposed stormwater pumping station. An Environmental Study Report (ESR) was prepared to document the activities and recommendations from the Class EA process.

As part of Phase 3 of the Class EA process and in consideration of the comments received through the stakeholder consultation during the SMP study, a further in-depth evaluation of the four alternative locations presented in the SMP was completed. This in-depth evaluation was initiated in January 2022 and the City hosted a Public Information Centre (PIC) to present preliminary evaluation of site alternatives in March 2022. As consultation is an integral part of the Class EA process, local residents, agencies, and other interested persons were invited to participate in this PIC and provide comments on the site evaluation. The comments received throughout this process were taken into consideration and the subsequent evaluation was summarized in a technical memorandum (memo). This technical memo entitled 'St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment – Schedule 'C' – Comparative Evaluation of Site Location' was finalized and posted to the project webpage in May 2022.

Following the completion of the technical memo and in continuation of Phase 3 of the Class EA process an evaluation of alternative design concepts including pump technologies, site layout, and architectural features was completed. Included in this evaluation were three alternative site layouts. This evaluation was initiated in May 2022 and a second PIC to present preliminary evaluation of design concept alternatives was hosted in June 2022. Local residents, agencies, and other interested persons were invited to participate in this PIC and provide comments on the alternative design concepts. The comments received throughout this process were taken into consideration and the subsequent evaluation is summarized in the ESR. Based on the evaluation and comments received through consultation, the recommended layout was revised from that used for the site evaluation presented in the technical memo.

The purpose of this note is to outline the timeline surrounding the changes to the site layout and identify that the Technical Memo (below) should be read in conjunction with the St. Rose Pumping Station ESR, more specifically, Section 5.2.5 'Amendments to the Technical Memo'. Note, the overall ranking of the four location alternatives remains unchanged and St. Rose Beach Park remains the highest ranked and the preferred location for the proposed pumping station.

Sincerely,

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ST. ROSE STORMWATER PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT – SCHEDULE 'C'

Comparative Evaluation of Site Location

May 2022

Prepared for:
City of Windsor

Prepared by:
Stantec Consulting Ltd.

Project Number:
165620239

This document entitled St. Rose Avenue Pumping Station – Comparative Evaluation of Site Location was prepared by Stantec Consulting Ltd. ("Stantec") for the account of City of Windsor (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.

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1.0 INTRODUCTION

1.1 BACKGROUND

1.1.1 GENERAL

The City of Windsor (City) has experienced a significant increase in extreme storm events in recent years in addition to record high water levels in Lake St. Clair and the Detroit River. These climatic and hydrological factors have resulted in significant basement, coastal, and surface level flooding throughout the city and surrounding municipalities. Coastal zones and low-lying areas, which includes Riverside and a majority of East Windsor, are at considerable risk for flood events that can negatively impact the community and cause damage to municipal infrastructure, residential / commercial properties, and local transportation networks. To address widespread flooding concerns, the City completed a comprehensive study known as the Sewer & Coastal Flood Protection Master Plan (SMP). The SMP identified the need for a new stormwater pumping station and new storm sewer outlet to the Detroit River to service the St. Rose drainage area.

The new pumping station is proposed to be in the vicinity of the existing stormwater outlet which is located on the north side of Riverside Drive East opposite St. Rose Avenue (within St. Rose Beach Park). The new pumping station will improve the outlet capacity and provide flood relief to the St. Rose drainage area. The pumping station capacity will provide a 1:100-year storm level of service for the areas generally from St. Rose Avenue / Virginia Avenue on the east to Thompson Boulevard / Esdras Place on the west and South National Street on the South to the Detroit River on the North. This will provide improved flood resilience for major roadways in the area such as Riverside Drive East and Jefferson Boulevard.

The evaluation under the SMP recommended the proposed St. Rose stormwater pumping station be located in the St. Rose Beach Park on the north side of Riverside Drive East within the existing sheet pile / break wall area of the park. This location is in close proximity to the existing outfall and does not require displacement of any existing residences. As evaluated in the SMP, this location has relatively straightforward means of construction and operation, low requirements and extent of maintenance, shorter timeline for implementation, minimal disruption during construction, and results in a lower capital cost compared to other potential sites. This location will impact the amount of available park space and unobstructed waterfront views in the area. There is potential that these impacts could be mitigated in the design phase through the use of landscaping amenities to improve the overall aesthetics of the facility and recreational functionality of the site. Local residents will have an opportunity to provide input during the high-level design process which will assist in selecting a design that is suitable for the neighbourhood.

1.1.2 PURPOSE OF REPORT

The SMP consisted of a comprehensive study with the objective to understand the causes and locations of basement, surface, and coastal flooding across the City. The SMP was developed as a high-level solution to address these flooding concerns. The solution identified to address issues in the St. Rose drainage area was a new stormwater pumping station. Four (4) locations were identified as a possible site based on various technical considerations and feasibility for implementation. An evaluation was completed under the SMP to identify the best location which was determined to be St. Rose Beach Park. Through the continuation of the Environmental Assessment process and in consideration of the comments received through the stakeholder consultation process (during the SMP study), a further in-depth evaluation is being completed and presented in this technical memorandum (memo) to confirm which of the four alternatives is most preferred. The SMP report can be accessed through the following weblink: Sewer and Coastal Flood Protection Master Plan (citywindsor.ca).

This Memo reviews the decision-making process and outcomes of a comparative analysis of the four (4) alternative locations presented in the SMP. For more details, refer to appendix 'E-2: St. Rose Avenue Pumping Station – Pumping Station Location Comparative Evaluation (October 2020)' which can be found within 'Appendix E – Technical Volume 2: Flood Reduction Alternative Solution Development' of the SMP.

This Memo will provide a more specific evaluation of the four (4) alternatives presented in the SMP based on the following evaluation criteria: social factors (impacts to local communities, archaeological and historic sites, recreational areas, other utilities, etc.), natural environment factors (air, climate, vegetation, fish and wildlife, surface drainage and groundwater, soil and geology, utilization of existing infrastructure, etc.), and economic factors (capital and O&M cost). The evaluation process is based on minimizing undesirable social, natural environment, and economic impacts while maximizing performance and efficiency, minimizing space requirements, and reducing operation and maintenance requirements. This Memo presents detailed rationale for each evaluation criterion and summarizes these findings using a scoring system to quantify these criteria. Where impacts to these evaluation criteria are unavoidable, either through construction or operation of the proposed facility, proposed mitigation measures are presented for consideration to minimize or negate those impacts.

2.0 REVIEW OF ALTERNATIVES FROM THE SEWER & COASTAL FLOOD PROTECTION MASTER PLAN

2.1 SITE LOCATION ALTERNATIVES

The SMP identified four (4) viable site locations for the proposed St. Rose pumping station. The locations are in the vicinity of the existing St. Rose Avenue storm sewer which is the primary outlet for the expanded St. Rose drainage area. The alternative locations were selected for further analysis based on their proximity to the existing outlet and the distance to the receiving watercourse. The four alternative locations are as follows:

- Alternative No. 1 – Construct the St. Rose Avenue pumping station in the St. Rose Beach Park on the north side of Riverside Drive East.
- Alternative No. 2 – Construct the St. Rose Avenue pumping station to the south of Riverside Drive and east of St. Rose Avenue.
- Alternative No. 3 – Construct the St. Rose Avenue pumping station to the south of Riverside Drive and west of St. Rose Avenue.
- Alternative No. 4 – Construct the St. Rose Avenue pumping station at the northwest corner of the intersection at St. Rose Avenue and Wyandotte Street East.

The evaluation criteria selected for the comparative location analysis under the SMP were the following:

- Meet Flood Mitigation Objectives
- Flexibility to Adjust to Climate Change
- Water Quality
- Impacts to the Natural Environment
- Coastal Flood Risk
- Complexity of Installation and Operation
- Anticipated Extent of Maintenance Required
- Length of Time Required for Implementation
- Disruption During Construction
- Permanent Changes to Urban Community
- Impacts to Archaeological, Built Heritage, and Cultural Heritage
- Relative Capital Cost

In the SMP, the evaluation of the four site alternatives took into consideration the following functional design elements: new pumping station wet well structure to house three (3) large sized pumps and two (2) smaller sized pumps (firm capacity of 13.5 m^3/s); building structure to house the electrical systems and pump controls; back-up power generator to provide standby power; on-site power transformer; vehicle access points; and landscaping amenities. The layout and functional design of the pumping station and other site features would be subject to fine tuning based on further stakeholder input and other factors during the Class Environmental Assessment Process.

2.2 SUMMARY OF EVALUATION OF ALTERNATIVE SITE LOCATIONS UNDER THE SMP

2.2.1 MEET FLOOD MITIGATION OBJECTIVES, FLEXIBILITY TO ADJUST TO CLIMATE CHANGE, WATER QUALITY, AND IMPACTS TO THE NATURAL ENVIRONMENT

In terms of the flood mitigation objectives; flexibility to adjust to climate change; ability to meet water quality objectives; and impact to the natural environment, all four location alternatives received equivalent ranks within each category. This means that during the SMP process the alternatives were considered to provide the same functionality and to have the same capacity to meet flood mitigation objectives which would be achieved through unique design solutions at each site location. In addition, the alternatives were deemed to have the same ability to adjust to climate change. In the SMP, the four locations were determined to have the same effect on the water quality during construction and same effect on the surrounding natural environment due to design solutions which mitigate these issues.

2.2.2 COASTAL FLOOD RISK

Coastal flooding is characterized as flooding caused by unusually high tides or storm surges in low lying areas located along shorelines. This type of flooding is typically dictated by the topography or elevation of the shoreline and surrounding areas. Alternative No. 4 was determined to be the preferred alternative in terms of the coastal flood risk. Alternative No.'s 1, 2 and 3, were determined to be at equivalent risk of coastal flooding due to their proximity to the Detroit River (less than or approximately equal to 75 meters). Alternative No. 4 has the lowest risk of coastal flooding because it is located significantly farther from the Detroit River (approximately 200 meters).

2.2.3 COMPLEXITY OF INSTALLATION AND OPERATION

Although each site presents various challenges for the construction of the proposed stormwater pumping station and sewers, Alternative No. 1 was determined to be the least complex because it has the shallowest pumping chambers and the lowest hydraulic head loss. These circumstances would allow for reduced pumping requirements, smaller pumping equipment, and improved pumping efficiency leading to easier installation and operation. To compare the complexities of construction for each location, the SMP process included a detailed breakdown of the following construction components: the pumping station wet well and equipment, pumping station excavation dewatering, excavation material, proximity to existing shoreline, shoreline flood protection, demolition of existing structures, sewer trench excavation dewatering, storm sewer installation, extent of existing utility relocation. Based on this analysis, it was determined that site specific challenges would be minimized for Alternative No. 1 making it the most preferred option. The challenges with constructing two large storm sewers along St. Rose Avenue make Alternative No. 4 the least preferred option.

2.2.4 ANTICIPATED EXTENT OF MAINTENANCE REQUIRED

In its evaluation, the SMP anticipated that the standard maintenance practices for the proposed pumping equipment and accessories will be similar for all four of the location alternatives. However, designs which incorporate enclosed forcemains will require additional forcemain maintenance. Moreover, any forcemain maintenance would require the pumping station to be shutdown or by-passed. Alternative No. 1 is the preferred alternative because no forcemain is required.

2.2.5 LENGTH OF TIME REQUIRED FOR IMPLEMENTATION

In terms of the length of time required for the implementation, Alternative No. 1 would be the preferred alternative. For Alternative No.'s 2, 3, and 4 there is a need to acquire private property and demolish existing structures which would delay the implementation timeline. In addition, there are risks associated with property acquisitions, such as the need to expropriate, which could further delay the implementation timeline. Any delays to the implementation timeline for the stormwater pumping station impact the timelines for the overall SMP implementation plan.

2.2.6 DISRUPTION DURING CONSTRUCTION

Temporary road closures and disruptions to St. Rose Avenue and Riverside Drive East will be required for all the location alternatives. Alternative No. 1 was determined to be the least disruptive because it is located on park land; is farther from residences and businesses; and would require the least amount of time for construction. Alternative No. 4 would require the most disruption due to the need to construct additional sewers and a forcemain along St. Rose Avenue to the Detroit River outlet. In addition, extensive utility relocation would be required; temporary sanitary flow pumping would be potentially required; and interim water distribution would be required during the construction of Alternative No. 4. Therefore, Alternative 1 was identified to be the preferred option.

2.2.7 PERMANENT CHANGES TO URBAN COMMUNITY

In the SMP the evaluation of the permanent changes to the urban community included the following considerations:

- Noise and Vibration Impacts
- Displacement of Existing Residents and Businesses
- Disruption to Greenspace and Parks
- Disruption to Waterfront Views

Noise and vibration impacts to the local residents as a result of the operation of the facility are expected to be negligible. As part of the pumping station design noise abatement measures, noise enclosures, landscaping and / or fencing buffers will be utilized to mitigate these impacts. In addition, the wet well structure and generator foundations will be adequately designed to mitigate vibrations.

In terms of the displacement of existing residents and businesses, Alternative No. 1 is considered the preferred site location. Alternative No.'s 2, 3, and 4 require the acquisition of property and displacement of existing residents and businesses to accommodate the proposed pumping station and equipment.

In terms of the disruption to greenspaces / parks and waterfront views, Alternative No. 1 is considered the least preferred site location. Constructing the pumping station and equipment within the park will have the highest permanent impact on the urban community. Therefore, Alternative No.’s 2, 3, and 4 would be the preferred alternatives.

2.2.8 IMPACTS TO ARCHAEOLOGICAL, BUILT HERITAGE, AND CULTURAL HERITAGE

In the vicinity of the four alternative locations there are no heritage classified or designated properties; therefore, minimal impacts are anticipated for each of the alternative sites. Further (Stage 2) archaeological assessments would be required for Alternative No.’s 1, 2, and 3 whereas Alternative No. 4 is anticipated to have the least potential for archaeological impacts. As a result, Alternative No. 4 would be considered the preferred alternative in terms of the impact to archaeological, built heritage, and cultural heritage.

2.2.9 RELATIVE CAPITAL COST

The SMP estimated Alternative No. 1 to have the lowest cost, Alternative No. 4 to have the highest cost, and Alternative No.’s 2 and 3 to have a cost between the other options. The SMP completed a detailed cost analysis for Alternative No.’s 1 and 4; however, this did not include the cost associated with property acquisitions or relocation of residents and businesses. The cost of construction for Alternative No. 1 is anticipated to be 15 – 20 % lower than Alternative No. 4; hence, Alternative No. 1 is the preferred option.

2.3 PREFERRED LOCATION FROM THE SMP

In summary, the initial comparative evaluation of the four alternative locations determined that Alternative No. 1, St. Rose Beach Park, was the preferred location. The comparative evaluation found that Alternative No. 4, the intersection of St. Rose Avenue and Wyandotte Street East, was not significantly less preferred than Alternative No. 1. However, Alternative No. 1 was selected as the preferred alternative due to constructability and operation requirements, minimal maintenance requirements, minimal time requirements for implementation, minimal disruption during construction, and a lower relative capital cost. In addition, this location would not displace existing residences or businesses.

3.0 DETAILED EVALUATION OF SITE SELECTION

3.1 SITE LOCATION ALTERNATIVES

The four (4) viable site locations identified for the St. Rose pumping station in the SMP will be further evaluated in this Memo. The four alternative locations are as follows:

- Alternative No. 1 – Construct the St. Rose Avenue pumping station in the St. Rose Beach Park on the north side of Riverside Drive East.
- Alternative No. 2 – Construct the St. Rose Avenue pumping station to the south of Riverside Drive and east of St. Rose Avenue.
- Alternative No. 3 – Construct the St. Rose Avenue pumping station to the south of Riverside Drive and west of St. Rose Avenue.
- Alternative No. 4 – Construct the St. Rose Avenue pumping station at the northwest corner of the intersection at St. Rose Avenue and Wyandotte Street East.

The location and general layout for the four options is depicted in **Figure 3-1** and available in **Appendix A** of this Memo. **Figures 3-2**, **3-3**, **3-4**, and **3-5**, available in **Appendix A**, depict the proposed pumping station layout for the four alternative locations. **Figures 3-6**, **3-7**, **3-8**, and **3-9** shown below depict the current land use at the four locations.

The evaluation of the four site alternatives took into consideration the following functional design elements that were determined in the SMP: new pumping station wet well structure to house 3 large sized pumps and two smaller sized pumps (firm capacity of 13.5 m^3/s); building structure to house the electrical systems and pump controls; back-up power generator to provide standby power; on-site power transformer; vehicle access points; and landscaping amenities. The proposed layout and functional design of the pumping station and other site features are subject to fine tuning during the detailed design process.

Figure 3-6: Location Alternative No. 1

Figure 3-7: Location Alternative No. 2

Figure 3-8: Location Alternative No. 3

Figure 3-9: Location Alternative No. 4

3.2 EVALUATION OF ALTERNATIVE SITE LOCATIONS

The four alternative sites were considered through a detailed evaluation. Evaluation criteria were developed based on those outlined in the SMP and considerations heard through consultation. Evaluation criteria were developed and categorized to assess potential short-term and longer-term impacts of the alternative site locations. The evaluation criteria are as follows:

Technical Criteria:

- Ability to Meet Flood Mitigation Objectives
- Flexibility to Adapt to Climate Change
- Coastal Flood Risk
- Anticipated Maintenance Requirements
- Time Required for Implementation

- Complexity of Installation and Operation
    - Pumping Station Wet Well and Equipment
    - Pumping Station Excavation Dewatering
    - Excavation Material Management
    - Demolition of Existing Structures
    - Storm Sewer Installation
    - Extent of Existing Utility Relocation

Social Criteria:

- Disruption During Construction
- Impacts to Archaeological, Built Heritage, and Cultural Heritage
- Development Policies
- Permanent Changes to Urban Community
    - Noise and Vibration Impacts
    - Generator Emission Impacts
    - Displacement of Existing Residents and Businesses
    - Disruption to Waterfront Parklands
    - Disruption to Waterfront Views

Natural Environment Criteria:

- Impacts to the Natural Environment
- Better Use of Existing Infrastructure

Economic Factors:

- Relative Capital Cost
- Relative Operation and Maintenance Cost

In order to objectively compare the four location alternatives, an evaluation matrix with a four-point scoring system was utilized. For each of the evaluation criteria, the four locations were scored on a scale of one to four (1 → 4), with one (1) being the least desirable and four (4) being the most desirable based on how well it performed in addressing the individual criterion. The individual evaluation criteria were assessed, and each site location was awarded an overall score based on the standard definitions outlined in **Table 3-1**. A summary of the scores is provided in the **Table**

3-3. Additional details and descriptions for the scores awarded for each of the evaluation criteria are provided in **Section 3.2.1** through **Section 3.2.4**.

Table 3-1: Evaluation Criteria Score Rating

Score	Scale	Score Description
1	Poor	Unsuitable or not fit for the desired application; negative impacts; disadvantageous; and/or undesirable given the project timeline, budget, scope, and standards.
2	Fair	Acceptable for the desired application; minimal negative impacts; adequate given the project timeline, budget, scope, and standards.
3	Good	Suitable or good for the desired application; negligible impacts; and/or agreeable given the project timeline, budget, scope, and standards.
4	Very Good	Favourable; positive impacts; advantageous; excellent given the project timeline, budget, scope, and standards.

3.2.1 TECHNICAL CRITERIA

3.2.1.1 Ability to Meet Flood Mitigation Objectives

Alternative No. 1 Score: 4

Alternative No. 2 Score: 4

Alternative No. 3 Score: 4

Alternative No. 4 Score: 4

During the SMP process it was identified that all stormwater infrastructure upgrades proposed throughout the City would be designed to meet the flood mitigation objective of providing service for the climate change storm (1 in 100-year storm + a 40% climate change factor). This pumping station capacity was selected due to its ability to meet the flood mitigation objectives, provide enhanced service to the vulnerable coastal areas, and adjust to climate change. However, based on public consultation, which occurred as a part of the SMP process, it was determined that the design of the proposed St. Rose stormwater pumping station would provide service in the case of a 1 in 100-year storm event with no climate change factor. This flood mitigation objective was set to reduce the required pumping capacity and size requirements of the proposed stormwater pumping station and minimize impact on the community. This flood mitigation objective corresponds to a firm stormwater pumping capacity of 13.5 m^3/s.

The design of the pumping station required to meet the capacity would be determined during the Schedule C Class Environmental Assessment and detailed design phases. Although the functional design of the pumping station will be the same for each of the location alternatives, site-specific features such as the layout, number of pumps, pumping equipment, and length of forcemains will be accounted for during these design phases. Each alternative site location would present individual challenges, that would affect the complexity of the installation, operation, and capital cost. However, based purely on the ability to meet flood mitigation objectives each alternative is considered a viable option for the stormwater pumping station. Because of this Alternative No.'s 1, 2, 3, and 4 all received a score of 'Very Good'.

3.2.1.2 Flexibility to Adapt to Climate Change

Alternative No. 1 Score: 4

Alternative No. 2 Score: 2

Alternative No. 3 Score: 2

Alternative No. 4 Score: 2

The City of Windsor has a long-standing commitment to Climate Change Mitigation and Adaptation Planning. This corporate environmental commitment was made through the development of an Environmental Master Plan in 2017 and was further developed through the Climate Change Adaptation Plan in 2020. In the Windsor Climate Change Adaptation Plan, the City determined that average precipitation values are expected to increase in the future, particularly in the seasons of winter and spring. The summer months may see a slight decrease in precipitation coupled with increasingly warm seasonal temperatures. In terms of extreme precipitation, the intensity and frequency of events is expected to increase in the future corresponding to a 25% increase in 10-year storm events and a 40% increase in 100-year storm events. For example, the City of Windsor has already experienced two 100-year storms in the years 2016 and 2017. On average more rain is expected to fall (in terms of mm/hr) during these periods of extreme precipitation. The water levels in Lake Erie and Lake St. Clair have been above average since 2013 and, in 2019, the Detroit River reached a high-water level of 176.08 meters. In the near future, water levels are expected to continue to be high.

Based on these climate change predictions, the required capacity of the proposed stormwater pumping station for this drainage area is only expected to increase in the future. For this reason, it is beneficial for the selected site to have additional space for future expansion. Alternative No. 1 is located in the St. Rose Beach Park and the proposed pumping station would occupy approximately 50 % of the lot. Of the four alternative locations only Alternative No.1 would have flexibility to adapt to climate change as there is opportunity for the pumping chambers to be expanded in the future. Therefore, this alternative received a score of 'Very Good'. Alternative No.'s 2, 3, and 4 are located in the midst of residential and commercial zones. In the future, if the pumping station is required to be expanded to meet climate change needs it will be more difficult and require the acquisition of additional residential or commercial properties. Hence, Alternative No.'s 2, 3, and 4 received a score of 'Fair'.

3.2.1.3 Coastal Flood Risk

Alternative No. 1 Score: 3

Alternative No. 2 Score: 4

Alternative No. 3 Score: 4

Alternative No. 4 Score: 4

Coastal flooding is characterized as flooding caused by unusually high tides or storm surges in low lying areas located along shorelines. This type of flooding is typically dictated by the topography or elevation of the shoreline and surrounding areas. The elevation of each site is approximately 175.00 meters; therefore, there is no significant difference in topography between the four alternatives. Coastal flooding events may be mitigated via engineered defense systems such as flood barriers, break walls, and levees or natural defence systems such as soil berms, gravel bars, and vegetation/wetlands. Due to the low elevation in many areas of East Windsor, and the record high water levels in the Detroit River and Lake St. Clair, a majority of the Riverside area is at increased risk of coastal flooding. However, this is being addressed City wide through the addition of two new stormwater pumping stations, improved or additional storm sewer outlets, and various stormwater pumping station upgrades. In addition, the City is planning to construct a landform barrier or earth berm at an elevation of 176.50 meters along Riverside Drive East to provide protection to in-land areas and low-lying properties.

Alternative No. 1 would be located inside of the existing Detroit River break wall barrier but outside of the proposed landform barrier; therefore, this location is at higher risk for coastal flooding. Alternative No.'s 2, 3, and 4 would be located inland of the proposed landform barrier and the existing Detroit River break wall barrier. Regardless of the chosen location, to provide protection against coastal flooding, all the sites would be designed such that the generator, electrical building, and top elevation of the pumping station are at or above an elevation of 176.50 meters, the instantaneous 1:100-year water level. As a result, the proposed stormwater pumping station would be at minimal risk for coastal flooding for all locations. For these reasons, Alternatives No. 1 received a score of 'Good' and Alternative No.'s 2, 3 and 4 received a score of 'Very Good'.

3.2.1.4 Anticipated Maintenance Requirements

Alternative No. 1 Score: 4

Alternative No. 2 Score: 3

Alternative No. 3 Score: 3

Alternative No. 4 Score: 3

The standard maintenance practices for the screen equipment, pumping equipment, pumping chambers, electrical building, electrical equipment, and instrumentation & controls are anticipated to be the same regardless of the pumping station location. Standard maintenance of the screens, pumps, and other equipment will require an access driveway for maintenance vehicles and crane trucks. In addition, lighting and security cameras will be required on site for maintenance and safety purposes.

The maintenance requirements are anticipated to vary based on the location of the pumping station and the forcemain to the outlet structure. The use of a forcemain will necessitate forcemain maintenance and clean outs. The outlet structure is incorporated into the pumping station's discharge piping for Alternative No. 1; therefore, forcemain maintenance will not be required. In addition, Alternative No. 1 would repurpose the existing outlet structure as a bypass which can be utilized to provide service when maintenance is required for the pumping station. Alternative No.'s 2 and 3 will each have a forcemain length of approximately 75 meters which would require regular maintenance. Alternative No. 4 would have a forcemain length of approximately 200 meters which would also require regular maintenance. For these alternatives, the existing outlet structure would not be able to act as a by-pass during maintenance events. Any forcemain or pump maintenance would require the pumping station to be shutdown or bypassed through external pumping, which needs to be scheduled around anticipated dry weather periods and leaves the area at risk while non-operational. Eliminating the need for forcemain maintenance would be beneficial resulting in Alternative No. 1 being the most preferred alternative. For these reasons, Alternative No. 1 received a score of 'Very Good', Alternative No. 2, 3, and 4 received a score of 'Good'.

3.2.1.5 Time Required for Implementation

Alternative No. 1 Score: 3

Alternative No. 2 Score: 2

Alternative No. 3 Score: 2

Alternative No. 4 Score: 1

The length of time required for the implementation and construction of the St. Rose stormwater pumping station is anticipated to vary based on the proposed location. The length of time required for the Class Environmental Assessment, detailed design process, and construction of the pumping chambers is expected to be similar regardless of the pumping station location. However, the implementation timeline will be affected by four main factors: (1) the time required for zoning amendments (2) the time required for property acquisition, (3) potential time required for the expropriation of residents/businesses, and (4) the time required for design and construction of the linear infrastructure surrounding the pumping station.

Alternative No.'s 1, 2, and 3 would likely require a zoning by-law amendment to be utilized for the proposed pumping station. This process would add to the time required for implementation. Alternative No. 4 would likely not require a zoning by-law amendment; therefore, would not require additional time for this step.

Alternative No. 1 occupies one lot which is owned by the City and would not require any property acquisition. Alternative No.'s 2 and 3 would require the acquisition of two and three residential properties, respectively. Alternative No. 4 would require the acquisition of one residential property, one commercial property, and a portion of the adjacent commercial parking lot. Due to the need for property acquisition, the timelines for implementation for Alternative No.'s 2, 3, and 4 will be longer. The locations that require the acquisition of properties have a risk of requiring additional time for the expropriation process. According to the Ontario Expropriation Association, in a majority of instances the expropriation of a property takes 9 to 12 months.

In terms of the time required for design and construction of the linear infrastructure surrounding the pumping station, Alternatives No. 1 will require the least amount of time because the distance to the outlet location is minimal. Alternative No.'s 2 and 3 will require more time due to the need to construct forcemains across Riverside Drive East and a new outlet chamber in the St. Rose Beach Park. Alternative No. 4 will require even more time due to the need to construct a forcemain down St. Rose Avenue and across Riverside Drive East, as well as construct a new outlet chamber in St. Rose Beach Park. In addition to the construction of the forcemain down St. Rose

Avenue, Alternative No. 4 would require the relocation of pole lines, gas mains, and other telecommunication utilities which are currently located in the 20-meter right-of-way. For these reasons Alternative No. 1 received a score of 'Good', Alternative No. 2 and 3 received a score of 'Fair', and Alternative No. 4 received a score of 'Poor'.

3.2.1.6 Complexity of Installation and Operation

Although each site presents various challenges for the construction of the proposed stormwater pumping station and related sewers, Alternative No. 1 was determined to be the least complex in terms of installation and operation. To compare the complexities of construction for each location the following construction components were evaluated: Pumping Station Wet Well and Equipment, Pumping Station Excavation Dewatering, Excavation Material, Demolition of Existing Structures, Storm Sewer Installation, and Extent of Existing Utility Relocation.

Pumping Station Wet Well and Equipment

Alternative No. 1 Score: 4

Alternative No. 2 Score: 3

Alternative No. 3 Score: 3

Alternative No. 4 Score: 1

From a constructability and operation standpoint the most preferred alternative for the pumping station wet well and pumping equipment would be the alternative with the shallowest pumping chambers and the lowest hydraulic head loss. These circumstances would allow for reduced pumping requirements, smaller pumping equipment, and improved pumping efficiency which contribute to ease of construction and long-term cost savings. These factors are directly related to the distance between the pumping station and the receiving outlet or outlet chamber. Based on this, Alternative No. 1 would be the most preferred alternative as this pumping station will have the lowest head loss and shortest discharge piping requirements. This means a less complex design, a shorter construction timeline, and more efficient operating conditions. Alternative No. 4 is located the farthest away from the outlet chamber therefore it would require increased pumping power to overcome the head losses that results from the long forcemain (approximately 200-meter). This would result in less favourable operating conditions such as increased pumping pressure and longer pump run times which increase wear and tear on the pumping equipment. Alternative No.'s 2 and 3 would require a pumping station depth and head loss between that of Alternative No. 1 and 4.

From an operational standpoint the pumping station design, which incorporates engineering redundancies and allows for bypassing during maintenance or failure events, would be the most desirable. Alternative No. 1 would repurpose the existing outlet structure as a by-pass which can be utilized to provide service during maintenance or pumping station failure events. Alternative No.'s 2, 3, and 4, would not have bypass infrastructure in place for maintenance or failure events. During planned maintenance events the pumping station would need to be shutdown or by-passed through external pumping and needs to be scheduled around anticipated dry weather periods. In the case of failure, the pumping station would need to be bypassed through external pumping, which leaves the area at risk while non-operational. For these reasons, Alternative No. 1 received a score of 'Very Good', Alternative No. 2 and 3 received a score of 'Good', and Alternative No. 4 received a score of 'Poor'.

<u>Pumping Station Excavation Dewatering</u>

Alternative No. 1 Score: 3

Alternative No. 2 Score: 3

Alternative No. 3 Score: 3

Alternative No. 4 Score: 4

From a constructability standpoint the requirements for excavation dewatering are directly related to the soil characteristics on site and the proximity to the existing shoreline. Based on preliminary sub-surface soil and groundwater assessments conducted at St. Rose Beach Park, the Detroit River water surface is approximately 0.9 – 1.1 meters below grade and the groundwater table is approximately 12.5 – 14.1 meters below grade. This indicates that the native silty clay soils have a low permeability; therefore, ground water control during the construction process will not be a substantial issue. It is anticipated that groundwater inflows from excavation can be managed by pumping the water with filtered sump pumps. Based on these soil characteristics and the distance to the shoreline, excavation pumping will be required and manageable by sump pump for Alternative No.'s 1, 2, and 3. Due to the larger distance from the shoreline, excavation pumping will be less for Alternative No. 4, making it more preferrable. For these reasons, Alternative No. 1, 2, and 3 received a score of 'Good' and Alternative No. 4 received a score of 'Very Good'.

Excavation Material Management

Alternative No. 1 Score: 4

Alternative No. 2 Score: 2

Alternative No. 3 Score: 2

Alternative No. 4 Score: 2

Based on the preliminary soil assessment carried out at St. Rose Beach Park, the excavation materials will be composed of two types (1) native sandy silty clay material and (2) sandy silty clay fill material. The silty clay fill materials may be re-used for industrial, commercial, and community land use onsite or offsite. This will be beneficial as the excess soil produced from excavation may be used for landscaping features within the park or at other community locations across the City. The native sandy silty clay materials were found to have molybdenum concentrations exceeding the Ontario Excess Soil Quality Standards (ESQS) Table 1. This excess concentration was determined to be naturally occurring and is well known to occur in southwestern Ontario due to glacial silt or clay deposits. This native soil can be re-used onsite for landscaping features; however, offsite re-use may be subject to regulatory restrictions. While the excess soil produced for the construction of the proposed pumping station is anticipated to exceed landscaping soil requirements, it is disadvantageous to have excess native soil materials on site. Alternative No. 1 will contain native soil material, which can be prioritized for re-use onsite, and fill material, which can be beneficially re-used for other projects across the City. Alternative No.'s 2, 3, and 4 are expected to contain mostly native soil material; a portion of which can be re-used for landscaping features onsite while excess is subject to regulatory restrictions. For these reasons, Alternative No. 1 received a score of 'Very Good' and Alternative No. 2, 3 and 4 received a score of 'Fair'.

Demolition of Existing Structures

Alternative No. 1 Score: 4

Alternative No. 2 Score: 1

Alternative No. 3 Score: 1

Alternative No. 4 Score: 1

Alternative No. 1 would not require the demolition of any buildings or other infrastructure; therefore, it would be the most preferred alternative. Alternative No. 2 would require the demolition of two residential buildings, landscaping features, and other concrete/asphalt surfaces. Similarly, Alternative No. 3 would require the demolition of three residential buildings, landscaping features, and other concrete/asphalt surfaces. Alternative No. 4 would require the demolition of one residential building, one commercial building, landscaping features, and a significant amount of concrete/asphalt surfaces. Alternative No.'s 2, 3, and 4 will require significantly more time and resources for demolition making them less desirable options. For these reasons, Alternative No. 1 received a score of 'Very Good' and Alternative No. 2, 3 and 4 received a score of 'Poor'.

Storm Sewer Installation

Alternative No. 1 Score: 4

Alternative No. 2 Score: 2

Alternative No. 3 Score: 2

Alternative No. 4 Score: 1

The installation of storm sewers leading to and from the pumping station to the outlet structure will also impact the constructability of the project. For ease of construction, it is desirable for the surrounding storm sewers to be short in length and shallow in depth. Alternative No. 1 is located close to the existing storm outlet and will incorporate the new outlet chamber into the pumping structure, reducing the number and complexity of surrounding storm sewers. The required storm sewers for this alternative will be the shortest and shallowest compared to the other locations.

Alternative No. 2 and 3 will require the construction of additional sewers along Riverside Drive and a small portion of St. Rose Avenue. These proposed sewers will increase the complexity of construction. The sewers will need to be installed at a sufficient depth to reduce conflicts with other utilities and water/wastewater infrastructure.

Alternative No. 4 will have the most complex requirements for the storm sewers due to its distance from the outlet location. Alternative No. 4 will require the construction of additional sewers along Riverside Drive, St. Rose Avenue, and a portion of Wyandotte Street. Due to the layout of the proposed stormwater infrastructure, two large stormwater sewers will be required along St. Rose Avenue. There is limited space in the St. Rose Avenue right-of-way; therefore, this alternative would require significantly longer and deeper storm sewers, which will significantly impact the constructability of these sewers. The sewers will need to be installed at a sufficient depth to reduce conflicts with other utilities and water/wastewater infrastructure. The sewers will need to be installed at an approximate depth of 6.0 meters which will require extensive utility relocation, specialized equipment and excavation, additional safety precautions, and full closure of the St. Rose Avenue right-of-way. For these reasons, Alternative No. 1 received a score of 'Very Good', Alternative No.'s 2 and 3 received a score of 'Fair', and Alternative No. 4 received a score of 'Poor'.

Extent of Existing Utility Relocation

Alternative No. 1 Score: 4

Alternative No. 2 Score: 3

Alternative No. 3 Score: 3

Alternative No. 4 Score: 1

Utility relocation poses challenges to the planning, design and construction of municipal projects, timelines may vary, and operational constraints may make it restrictive. Ideally, the location with the least amount of utility relocations will be the preferred option. In this scenario, Alternative No. 1 is the preferred alternative because there would be minimal requirements and likely no need for utility relocation. Alternative No.'s 2 and 3 would require some utility relocation for the gas mains and aerial services. Alternative No. 4 would require extensive utility relocation to accommodate the two large sewers which need to be installed in the St. Rose Avenue right-of-way. Utility relocation along St. Rose Avenue will include pole lines, gas mains, and other telecommunication utilities, which will require property acquisition or easements on the east and west side of St. Rose Avenue. There is also a potential need to provide temporary wastewater flow pumping, on-grade water distribution, and other measures to maintain service during construction. This significantly increases the complexity for construction for Alternative No. 4 making it the least preferred alternative. For these reasons, Alternative No. 1 received a score of 'Very Good', Alternative No. 2 and 3 received a score of 'Good', and Alternative No. 4 received a score of 'Poor'.

3.2.2 SOCIAL CRITERIA

3.2.2.1 Disruption During Construction

Alternative No. 1 Score: 3

Alternative No. 2 Score: 2

Alternative No. 3 Score: 2

Alternative No. 4 Score: 1

During the construction phase of this project, it is anticipated that all site locations would result in some level of temporary disruption to the community and nearby residents. When considering the temporary disruptions, it is important to consider the impact the operation of equipment and movement of construction vehicles can have on air quality, noise and vibration, community life, and pedestrians and traffic routes. The impacts on air quality, noise, and vibration, and community life will be mitigated through standard construction procedures. A proposed mitigation measure to be employed during the construction phase of this project is the use of a field ambassador. This field ambassador would be available to the community as a point of contact to maintain dialogue ahead of and during construction. This allows impacted community members voice their concerns throughout the process and stay informed of planned construction activities and mitigation measures. All alternatives will have similar impacts in these categories; however, the duration of these impacts is anticipated to be longer for Alternative No.’s 2, 3, and 4 due to the need to construct additional upstream and downstream infrastructure.

All pumping station locations would require the temporary closure of Riverside Drive East for the installation of storm sewers or, in the case of Alternative No.’s 2, 3, and 4, a forcemain to the outlet structure. In addition, the movement of construction vehicles and equipment would cause continued traffic disruptions on Riverside Drive and St. Rose Avenue throughout construction. Alternative No.’s 2, 3, and 4 would also require some temporary closure of St. Rose Avenue. Due to the required depth and size of the storm sewers in the St. Rose Avenue right-of-way and the need for advanced utility relocation, there would be significant disruptions to the surrounding community for Alternative No. 4. Moreover, this alternative would potentially require temporary sanitary flow pumping, interim on-grade water distribution, and other measures to maintain service to the area during construction. Throughout the construction process access to driveways on St. Rose Avenue and emergency vehicle access to the region will be restricted. In addition, the construction requirements for Alternative No. 4 would impact the traffic and pedestrian routes on Wyandotte Street East. This would include impacts to a bus stop located on Wyandotte Street East in front of the proposed pumping station location. Alternative No. 4 is considered the least preferred option. Alternative No. 1 is considered the most preferred option and Alternative No.’s 2 and 3 are considered slightly less preferred.

It is also important to consider the anticipated timeline for the construction based on the different alternatives. Alternative No.’s 2, 3, and 4 will require demolition of the existing structures, which adds to the construction timeline and therefore the length of disruptions to the community. Alternative No. 1 would not require any additional demolition; therefore, it will not be as disruptive. Further, Alternative No. 1 will require the shortest timeline for construction because the distance to the outlet location is minimal. Alternative No.’s 2 and 3 will require more time due to the need to construct forcemains across Riverside Drive East and a new outlet chamber in St. Rose Beach Park. Alternative No. 4 will require more time due to the need to construct a forcemain down the length of St. Rose Avenue and across Riverside Drive East as well as the new outlet chamber in St. Rose Beach Park. For these reasons, Alternative No. 1 received a score of ‘Good’, Alternative No.’s 2 and 3 received a score of ‘Fair’, and Alternative No. 4 received a score of ‘Poor’.

3.2.2.2 Impacts to Archaeological, Built Heritage, and Cultural Heritage

Alternative No. 1 Score: 4

Alternative No. 3 Score: 4

Alternative No. 2 Score: 4

Alternative No. 4 Score: 4

In order to determine the impacts to archaeological resources, Stage 1 archaeological assessments were carried out for each of the site alternatives. During the Stage 1 assessment carried out for St. Rose Beach Park, it was determined that the northern portion of the study area was artificially created between 1975 and 2000 through a process of infilling the south shore of the Detroit River. These artificial lands which make up a majority of the St. Rose Beach park hold no to low archaeological potential. The northern edge of Riverside Drive was determined to potentially represent the original shoreline of the Detroit River and therefore holds some potential for archaeological resources. For these reasons, a Stage 2 assessment is required for the sites located near Riverside Drive which includes Alternative No.’s 1, 2, and 3.

A Stage 2 archaeological assessment was carried out for the southern portion of St. Rose Beach Park along Riverside Drive. During the Stage 2 assessment, no archaeological resources were discovered during test pit surveying and thus no further land-based archaeological assessment of the study area is required. Based on these assessments, all the site alternatives are anticipated to have minimal to no archaeological impacts.

In the Municipal Class Environmental Assessment process, built and cultural heritage considers historical plaques, park monuments, murals, sculptures, heritage building(s) or site(s), and/or museums that have historic, aesthetic, or social significance to a community. Properties or sites of built and cultural heritage in the City of Windsor are recognized by their inclusion in the Windsor Municipal Heritage Register. There are no listed or designated properties on or surrounding the proposed site locations. The heritage resources around the proposed work area were identified based on the Windsor Municipal Heritage Register provided by the City of Windsor. The City of Windsor’s Planning and Building Services Department was also consulted to determine the location and details of Built Heritage and Cultural Heritage Landscapes. The proposed work is located away from these built heritage and cultural heritage landscapes; therefore, it is not expected to impact heritage resources in the area.

The pumping station and related structures will incorporate the general aesthetic and character of the neighbourhood. This will be accomplished by selecting architectural and landscaping features that compliment the St. Rose/Riverside neighbourhood. As part of the design process, local residents will be consulted to provide input on design features and finishes. For these reasons, Alternative No.'s 1, 2, 3, and 4 received a score of 'Very Good' for this evaluation criterion.

3.2.2.3 Development Policies

Alternative No. 1 Score: 1

Alternative No. 2 Score: 4

Alternative No. 3 Score: 4

Alternative No. 4 Score: 4

The Class EA process for the St. Rose stormwater pumping station will consider development policies and practices at the municipal, provincial, and federal level. Municipal development policies that were of particular interest for this project include the Windsor 2017 Environmental Master Plan (EMP) and the City of Windsor Official Plan. The 2017 EMP aims to make the City of Windsor more environmentally friendly and sustainable through five goals: (A) improving air quality, (B) improving water quality, (C) responsible land use, (D) increase resource efficiency, (E) promote awareness. The design and implementation of the St. Rose stormwater pumping station will conform to the 2017 EMP for any of the four alternative site locations by improving upon Goal B - Objective B2 'Improve Stormwater Management to Reduce the Risk of Flooding to Residents'.

The City of Windsor Official Plan is a policy document adopted by City Council under the Ontario Planning Act which provides guidance for development within the municipality. Policy 8.9 of the Official Plan relates to Views and Vistas and identifies the need to protect and improve views of significant landmarks and features such as the Detroit River. Alternative No. 1 would impact the view of the Detroit River at St. Rose Beach Park. Further, Policy 6.7.3.15 of the Official Plan outlines the considerations required for the disposition of lands acquired for public open space. These considerations include: (a) the adequacy of other Public Open Space within the area to serve the recreation and leisure needs of residents; (b) the ability of the Municipality to provide alternative or suitable Public Open Space in the event the standards are not met; (c) the suitability of the site for other land uses; (d) the environmental significance and ecological sensitivity of the site; (e) public input; (f) any legal agreements, easements or covenants affecting the property; and (g) the historical significance of the Public Open Space. While not technically a disposition of public open space lands, Alternative No. 1 would involve a reduction in some of the open space in St. Rose Beach Park (as discussed in more detail under 3.2.2.4 "Disruption to Waterfront Parklands") and is less desirable than Alternative No's. 2, 3, and 4 from this perspective.

As part of the Municipal Class Environmental Assessment process this study will be reviewed by Windsor City Council, Essex Regional Conservation Authority (ERCA), Ontario Ministry of Environment, Conservation and Parks (MECP), Ontario Ministry of Heritage, Sport, Tourism and Cultural Industries (MHSTC), and other regulatory agencies. Additionally, the proposed pumping station will require a Site Plan Control approval to ensure the final design complies with appropriate provincial plans and policy statements, official plans, zoning-by-laws, community planning permit systems, and building permits.

St. Rose Beach Park (Alternative No.1) is currently zoned Green District 1.1 (GD1.1) and would require a zoning by-law amendment to permit a pumping station at this location. In addition, Alternative No. 1 has a historic restrictive covenant in the deed for the property which indicates buildings or motor vehicles are not permitted on the property. While this restrictive covenant is deemed expired under the Land Titles Act as it is has been registered to the property for over forty (40) years, it should be removed from title to be utilized for the proposed pumping station. Alternative No.'s 2 and 3 are currently zoned Residential District 1.6 (RD1.6) and would only require a zoning by-law amendment if the proposed pumping station does not comply with the least restrictive provisions for Zoning District RD1.6. Alternative No. 4 is currently zoned Commercial District 2.1 (CD2.1) and would also only require a zoning by-law amendment if the proposing pumping station did not comply with the provisions for CD2.1 zoning. Based on the existing zoning policies and restrictions on the St. Rose Beach park property, Alternative No.'s 2, 3, and 4 are the preferred site options in this category. These alternatives received a score of 'Very good' and Alternative No. 1 received a score of 'Poor'.

3.2.2.4 Permanent Changes to Urban Community

Permanent changes to the urban community will be assessed based on the anticipated long-term impacts that the operational phase of the proposed St. Rose stormwater pumping station will have on the local community. Factors that will be used to determine the level of impact are to include the noise and vibration, generator emissions, displacement of existing residences and businesses, disruption to parklands, and disruption to waterfront views. Overall, the implementation of the St. Rose stormwater pumping station will have positive permanent impacts on the urban community by reducing the risk of surface and coastal flooding.

Noise and Vibration Impacts

Alternative No. 1 Score: 4

Alternative No. 2 Score: 2

Alternative No. 3 Score: 2

Alternative No. 4 Score: 3

In terms of the noise and vibration, permanent changes to the urban community are anticipated to be minimal due to the abatement measures and mitigation methods that will be implemented in the pumping station design. The proposed pumping station will be designed in accordance with the Ontario Ministry of Environment, Conservation and Parks (MECP) Environmental Noise Guidelines. The MECP has stringent sound attenuation requirements, which will ensure the appropriate engineering control measures are in place and minimize noise and vibration emissions to the surrounding neighbourhood.

It is important to note that this is a stormwater pumping station and the stormwater pumps are designed to operate during rainfall events; therefore, equipment on the site will not produce noise or vibrations on a regular basis. The main source of noise and vibration during the operation of the pumping station will be the pumps operating in the wet well structure and the generator operating on the generator foundation. The noise and vibrations caused by the pumps in the wet well structure will be minimized by properly designing the foundation structure. The noise and vibrations caused by the generator will be minimized by properly designing the generator foundation structure, ensuring proper installation and alignment, noise enclosures, landscape or fencing buffers and/or other mitigation measures.

In addition to these mitigation measures, increasing the distance between the pumping station and the nearby residences will minimize the noise and vibration impacts. For Alternative No. 1, the generator and the pumping structure will be located at a minimum of approximately 50 meters from the nearest residents. Whereas for Alternative No.’s 2, 3, and 4, the generator and the pumping structure will be located at a minimum of approximately 30 meters. Compared to Alternative No.’s 2 and 3, Alternative No. 4 is located on a lot zoned as commercial which would allow for higher noise and vibration tolerances. For these reasons, Alternative No. 1 received a score of ‘Very Good’, Alternative No.’s 2 and 3 received a score of ‘Fair’, and Alternative No. 4 received a score of ‘Good’.

Generator Emission Impacts

Alternative No. 1 Score: 4

Alternative No. 2 Score: 2

Alternative No. 3 Score: 2

Alternative No. 4 Score: 3

In terms of the generator, permanent changes to the urban community are anticipated to be minimal due to abatement measures and mitigation methods that will be employed in the pumping station design. It is important to note that this is a stormwater pumping station and the generator equipment will only operate during a significant rainfall event in which there is a power outage or during regular maintenance testing. Modern emergency power generators are manufactured to comply with MECP regulations and are more efficient than traditional diesel generators. The emissions caused by the generator will be minimized by proper design of the generator exhaust system, ensuring regular maintenance and servicing, landscaping, or fencing buffers and/or other mitigation methods. The proposed pumping station will be designed in accordance with the MECP Guidelines. The MECP has stringent emission requirements which will ensure the appropriate engineering control measures are in place and minimize emissions to the surrounding neighbourhood.

In addition to these mitigation measures, increasing the distance between the pumping station and the nearby residences will minimize impacts to the community. For Alternative No. 1, the generator will be located farther from the nearest residents. Moreover, the Detroit River to the north and the small bay to the west provide adequate separation from other residential properties. Whereas for Alternative No.'s 2, 3, and 4, the generator and the pumping structure will be located closer to the nearest residents. Alternative No. 4 is located in a commercial zoning area which may allow for slightly higher emission allowances. For these reasons, Alternative No. 1 received a score of 'Very Good', Alternative No.'s 2 and 3 received a score of 'Fair', and Alternative No. 4 received a score of 'Good'.

Disruption or Displacement of Existing Residents and Businesses

Alternative No. 1 Score: 4

Alternative No. 2 Score: 1

Alternative No. 3 Score: 1

Alternative No. 4 Score: 1

In considering the preferred site location, the size and space requirements of the pumping station had to be taken into consideration. Three of the four sites identified, require property acquisition to allow for the pumping station build out and to provide a mandatory buffer from surrounding properties. Alternative No.'s 2, 3, and 4 require the acquisition of property and therefore will displace some residents. Alternative No. 1 does not require the acquisition or displacement of any residents or business. Alternative No. 2 requires the displacement of two existing residences. Alternative No. 3 requires the displacement of three existing residences. Alternative No. 4 requires the displacement of one residential property, one commercial property, and a portion of the adjacent parking lot.

In terms of the disruption to existing residents and businesses, it is important to consider the distance between the nearest resident and the pumping station equipment. For Alternative No. 1, the generator and the pumping structure will be located at a minimum of approximately 50 meters from the nearest residents. Whereas for Alternative No.'s 2, 3, and 4, the generator and the pumping structure will be located at a minimum of approximately 30 meters. For this reason, it can be expected that Alternative No. 1 will cause the least disturbance to existing residents. Therefore, Alternative No. 1 received a score of 'Very Good', and Alternative No.'s 2, 3, and 4 received a score of 'Poor'.

Disruption to Waterfront Parklands

Alternative No. 1 Score: 1

Alternative No. 2 Score: 4

Alternative No. 3 Score: 4

Alternative No. 4 Score: 4

The proposed pumping station, no matter the location, will have some permanent impact on the parkland. Alternative No.'s 2, 3 or 4 will require an outlet structure to be constructed in the park area. The construction of this outlet structure will cause temporary closure of the park space and disruption to park services. Permanent changes to the park space from the selection of Alternative No.'s 2, 3 or 4 will include construction of an underground outlet structure and construction of an on grade access hatch in the park which provides entry to the sewer outlet for maintenance.

Alternative No. 1 will have a larger impact on the waterfront park in comparison to the other alternatives. The construction of the pumping chambers and other equipment will occupy approximately 50 % of the St. Rose Beach Park; however, a portion of the pumping structure will be located below the ground. As a result, the above ground structures and access driveway in the park will occupy approximately 25 % of the park's surface. Potential mitigating features on the site will include enclosed inlet and outlet pumping chambers located beneath the ground level to increase greenspace, permeable 'green' driveway for vehicle access, green roof, garden beds, benches, and other features to be confirmed during final detailed design. While St. Rose Beach Park currently contains minimal park services or landscaping features, the community will be able to enjoy physical activity, picnics, fishing, and other recreational activities in the space unoccupied by the driveway and above ground structures. For these reasons, Alternative No. 1 received a score of 'Poor' and Alternative No.'s 2, 3, and 4 received a score of 'Very Good' within this evaluation criterion.

Disruption to Waterfront Views

Alternative No. 1 Score: 1

Alternative No. 2 Score: 4

Alternative No. 3 Score: 4

Alternative No. 4 Score: 4

In terms of the permanent changes the stormwater pumping station will have on waterfront views, Alternative No.'s 2, 3 and 4 are considered the preferred in comparison to Alternative No.1.

Alternative No. 1 will have a greater impact on the waterfront views compared to the other alternatives. The construction of the pumping chambers and other equipment will block a portion of the riverfront view at the St. Rose Beach Park; however, appropriate design measures will be proposed to reduce the number of structures impeding the view. For example, all of the pumping station chambers have been designed to be located at or below the ground level, which reduces the disruption to the waterfront view. In addition, the impact of the disruption can be mitigated by including unique landscaping and architectural features to improve the aesthetic of the pumping station and ensure it blends with the character of the existing neighbourhood. For these reasons, Alternative No. 1 received a score of 'Poor' and Alternative No.'s 2, 3, and 4 received a score of 'Very Good' within this evaluation criterion.

3.2.3 NATURAL ENVIRONMENT CRITERIA

3.2.3.1 Impacts to the Natural Environment

Alternative No. 1 Score: 4

Alternative No. 2 Score: 4

Alternative No. 3 Score: 4

Alternative No. 4 Score: 4

This criterion considered the potential negative effects the pumping station could have on the natural environment based on criteria that are outlined in the Municipal Class Environmental Assessment process including: climate, geology and physiography, soils and subsurface conditions, natural vegetation, and aquatic or terrestrial life and habitats. The location of the proposed pumping station will have negligible effect on most of these natural environment criteria. It is most important to consider the effects that the construction and operation of the pumping station will have on the natural vegetation and terrestrial animal life. The construction phase of this project has potential to cause disturbances to the lands surrounding the pumping station and the waters of the Detroit River near the outlet location. These impacts are applicable for all of the locations due to the need to construct an outlet structure in the park and disrupt the existing break wall. Mitigation measures will be implemented during construction to ensure impacts to the natural environment are minimized.

It is important to consider the current condition of the sites. The four alternatives are located in urban settings and the vegetation in the area has low ecological diversity, which does not support strong terrestrial ecosystems. The four sites are largely covered with landscaping, grass, structures, or concrete surfaces. The design and development of the stormwater pumping station will include additional landscaping features and increased plant diversity to minimize impacts to the existing natural environment and terrestrial habitats. For these reasons, Alternative No.’s 1, 2, 3, and 4 all received a score of ‘Very Good’ for this evaluation criterion.

3.2.3.2 Better Use of Existing Infrastructure

Alternative No. 1 Score: 4

Alternative No. 3 Score: 3

Alternative No. 2 Score: 3

Alternative No. 4 Score: 2

Better use of existing infrastructure is characterized by the use of proper planning principles to maximize the life, performance, and value of existing infrastructure including the services the infrastructure can provide. By employing these planning principles, we can ensure that infrastructure meets the current needs of our communities and plans for future needs (including extreme weather conditions). Better use of existing infrastructure also highlights the repair and maintenance of existing infrastructure as opposed to replacement. The implementation of a stormwater pumping station for the St. Rose drainage area is vital to improve efficiency and reduce the risk of flooding caused by severe storm events for current and future generations.

The existing stormwater infrastructure in the area is designed and constructed such that storm runoff flows towards the outlet located in the St. Rose Beach Park. If the proposed pumping station is located near this existing outlet, it will optimize the utilization of the existing stormwater collection system. If the proposed pumping station is not located near the existing outlet, additional sewers will need to be constructed upstream and downstream to convey water between the outlet location and the pumping station. The farther the pumping station is located from the outlet, the more storm sewer infrastructure is required to be constructed. Alternative No. 1 is located the closest to the existing outlet structure, which will eliminate the need for additional storm sewers and is therefore considered a better option since it is utilizing the existing infrastructure. Alternative No. 4 is located the farthest from the existing outlet and will require the construction of additional storm sewers.

Furthermore, Alternative No. 4 requires a large amount of above ground infrastructure (roads, sidewalks, utilities, pole lines, etc.) be removed, relocated, and/or replaced as a part of the storm sewer construction. The extent of this replacement for Alternative No. 4 will include all of St. Rose Avenue. Alternative No.'s 2 and 3 will require some replacement of existing above ground infrastructure. Alternative No. 1 will require a minimal amount of replacement of existing infrastructure. For these reasons, Alternative No. 1 received a score of 'Very Good', Alternative No. 2 and 3 received a score of 'Good', and Alternative No. 4 received a score of 'Fair'.

3.2.4 ECONOMIC CRITERIA

3.2.4.1 Relative Capital Cost

Alternative No. 1 Score: 4

Alternative No. 2 Score: 3

Alternative No. 3 Score: 2

Alternative No. 4 Score: 1

In order to evaluate which alternative has the lowest capital cost, a preliminary cost analysis was carried out for each of the site alternatives. The preliminary cost analysis represents a planning level Opinion of Probable Cost (OPC) and is presented in **Table 3-2**. The following is a summary of the key assumptions applied for the OPC analysis:

- The Probable Costs are presented in 2022 dollars.
- Equipment costs are based on vendor supplied price quotations and historical 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 30% 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 3-2: Preliminary Capital Cost Analysis (Planning Level Opinion of Probable Cost)

Item	Alternative No. 1	Alternative No. 2	Alternative No. 3	Alternative No. 4
Pumping Station and Outlet Structure	$22,000,000	$22,500,000	$22,500,000	$22,500,000
Linear Infrastructure (Additional Storm Sewers Upstream and Downstream from Pump Station)	Included in the Above Cost.	$800,000	$800,000	$6,000,000
Utility Relocation	N/A	N/A	N/A	$500,000
Building Demolition	N/A	$200,000	$300,000	$200,000
Total Capital Cost:	**$22,000,000 (1)**	**$23,500,000 + Acquisition of 2 Properties (2)**	**$23,600,000 + Acquisition of 3 Properties (2)**	**$29,200,000 + Acquisition of 2 Properties (2)**

(1) The preliminary cost analysis does not include an estimate for the value associated with loss of a portion of this parkland. The loss of parkland will not represent a capital cost expense to the City of Windsor; however, this park does hold a value to the community. It is not possible to produce an accurate estimate of this inherent value and it will not significantly increase the capital cost; therefore, it is not included in this analysis.

(2) The preliminary cost analysis does not include an estimate for the property acquisition or potential relocation. These values are tied to the current real estate market and may vary depending on the resident's willingness to relocate. Therefore, it is not possible to produce an accurate estimate of these costs at this stage of the project. It is anticipated that the cost for property acquisition and relocation will significantly increase the capital cost for Alternative No.'s 2, 3, and 4.

Based on the preliminary analysis Alternative No. 1 is the preferred alternative. Alternative No. 2 is the next most preferred alternative with a cost increase of approximately 7 % plus the cost of acquiring two residential properties (in comparison to Alternative No. 1). Alternative No. 3 is the next most preferred alternative with a cost increase of approximately 7 % plus the cost of acquiring three residential properties (in comparison to Alternative No. 1). Alternative No. 4 is the least preferred alternative with a cost increase of approximately 33 % plus the cost of acquiring one residential property, one commercial property, and one parking lot (in comparison to Alternative No. 1). For these reasons, Alternative No. 1 received a score of 'Very Good', Alternative No. 2 received a score of 'Good', Alternative No. 3 received a score of 'Fair', and Alternative No. 4 received a score of 'Poor'.

3.2.4.2 Relative Operation and Maintenance Cost

Alternative No. 1 Score: 4

Alternative No. 2 Score: 3

Alternative No. 3 Score: 3

Alternative No. 4 Score: 2

The preferred location for the St. Rose stormwater pumping station would have an optimized design that reduces the relative cost for operation and maintenance. Alternative No. 1 is considered the preferred alternative because of its proximity to the outlet location. The proximity to the outlet reduces head losses in the outlet pipe and corresponds to lower pumping power requirements. This decrease in pumping power translates to decreased power usage and thus reduced operational costs. Alternative No. 4 is the least preferred because of the head losses incurred in the approximately 200-meter length of forcemain along St. Rose Avenue. These head losses correspond to increased pump power requirements, power usage, and thus operation costs. The longer the forcemain, the higher the operating cost for pumping. Alternative No.'s 2 and 3 would have higher power requirements and operation costs that are between those of the aforementioned alternatives.

In terms of the maintenance costs, the alternative's that require forcemains will require additional maintenance and cleaning resulting in increased maintenance costs. As discussed in **Section 3.2.1.4**, Alternative No. 1 would not require forcemain maintenance and Alternative No.'s 2, 3, and 4 will require forcemain maintenance. Based on this, Alternative No. 1 is the most preferred and Alternative No. 4 is the least preferred. For these reasons, Alternative No. 1 received a score of 'Very Good', Alternative No. 2 and 3 received a score of 'Good', and Alternative No. 4 received a score of 'Fair'.

3.2.5 SITE EVALUATION MATRIX

The evaluation matrix and scores are summarized in **Table 3-3**. The total score for each alternative was determined as the sum of scores for each of the evaluation criterion. The preferred location for the St. Rose stormwater pumping station is the alternative which received the highest total score. Based on the evaluation, the preferred location for the St. Rose stormwater pumping station is Alternative No. 1 – St. Rose Beach Park with a total score of 79 points. The second most preferred location is Alternative No. 2 with a total score of 65 points. The third most preferred location is Alternative No. 3 with a total score of 64 points. The least preferred location for the St. Rose stormwater pumping station is Alternative No. 4 with a total score of 57 points.

Table 3-3: Evaluation of Alternative Site Locations

Evaluation Criteria	Score (1 → 4)			
	Alternative No. 1	**Alternative No. 2**	**Alternative No. 3**	**Alternative No. 4**
Technical Criteria				
Ability to Meet Flood Mitigation Objectives	4	4	4	4
Flexibility to Adapt to Climate Change	4	2	2	2
Coastal Flood Risk	3	4	4	4
Anticipated Maintenance Requirements	4	3	3	3
Time Required for Implementation	3	2	2	1
Complexity of Installation and Operation	-	-	-	-
Pumping Station Wet Well and Equipment	4	3	3	1
Pumping Station Excavation Dewatering	3	3	3	4
Excavation Material Management	4	2	2	2
Demolition of Existing Structures	4	1	1	1
Storm Sewer Installation	4	2	2	1
Extent of Existing Utility Relocation	4	3	3	1
Social Criteria				
Disruption During Construction	3	2	2	1
Impacts to Archaeological, Built Heritage, and Cultural Heritage	4	4	4	4
Development Policies	1	4	4	4
Permanent Changes to Urban Community	-	-	-	-
Noise and Vibration Impacts	4	2	2	3
Generator Emissions	4	2	2	3
Disruption or Displacement of Existing Residents and/or Businesses	4	1	1	1
Disruption to Waterfront Parklands	1	4	4	4
Disruption to Waterfront Views	1	4	4	4
Natural Environment Criteria				
Impacts to the Natural Environment	4	4	4	4
Better Use of Existing Infrastructure	4	3	3	2
Economic Criteria				
Relative Capital Cost	4	3	2	1
Relative Operation and Maintenance Cost	4	3	3	2
Total Score: (xx/92)	**79**	**65**	**64**	**57**

4.0 SUMMARY

This Technical Memo presents a thorough review and detailed evaluation of the four alternatives that were identified in the Sewer Master Plan (SMP). This assessment includes a detailed review of the comparative evaluation of the four location alternatives under the SMP. **Section 2.0** summarizes the decision-making process and outcomes of the comparative location analysis presented in the SMP.

Further to the SMP analysis, this Memo evaluated the four (4) viable alternatives based on a variety of evaluation criteria and the decision-making process used a four-point scoring system based on consideration of the impacts of each criterion. Further, this Memo presents the detailed rationale for the score given to each alternative for each of the evaluation criterion. The preferred location of the St. Rose stormwater pumping station is considered the location which received the highest total score.

Based on the evaluation, the preferred location for the St. Rose stormwater pumping station is Alternative No. 1 – St. Rose Beach Park with a total score of 79 points. The second most preferred location is Alternative No. 2 with a total score of 65 points. The third most preferred location is Alternative No. 3 with a total score of 64 points. The least preferred location for the St. Rose stormwater pumping station is Alternative No. 4 with a total score of 57 points.

Through this detailed analysis, the St. Rose Beach Park was identified as the preferred site for the proposed pumping station based on its ability to satisfy a majority of the evaluation criteria. Benefits of the St. Rose Beach Park identified through this evaluation include no displacement of existing residents or businesses. This location presents the opportunity to meet flood mitigation objectives and utilize mitigation measures to lessen undesirable social impacts. This site provides the most flexibility to adjust to climate change with room for potential expansion to meet future needs. This location does not require a forcemain and results in relatively simple construction, operation, and maintenance requirements with the shortest timeline for implementation and construction. The disruption to the nearby residents and community during construction is the lowest for this alternative. In addition, the St. Rose Beach Park location would result in the lowest relative capital and operation cost.

APPENDICES

APPENDIX A - FIGURES

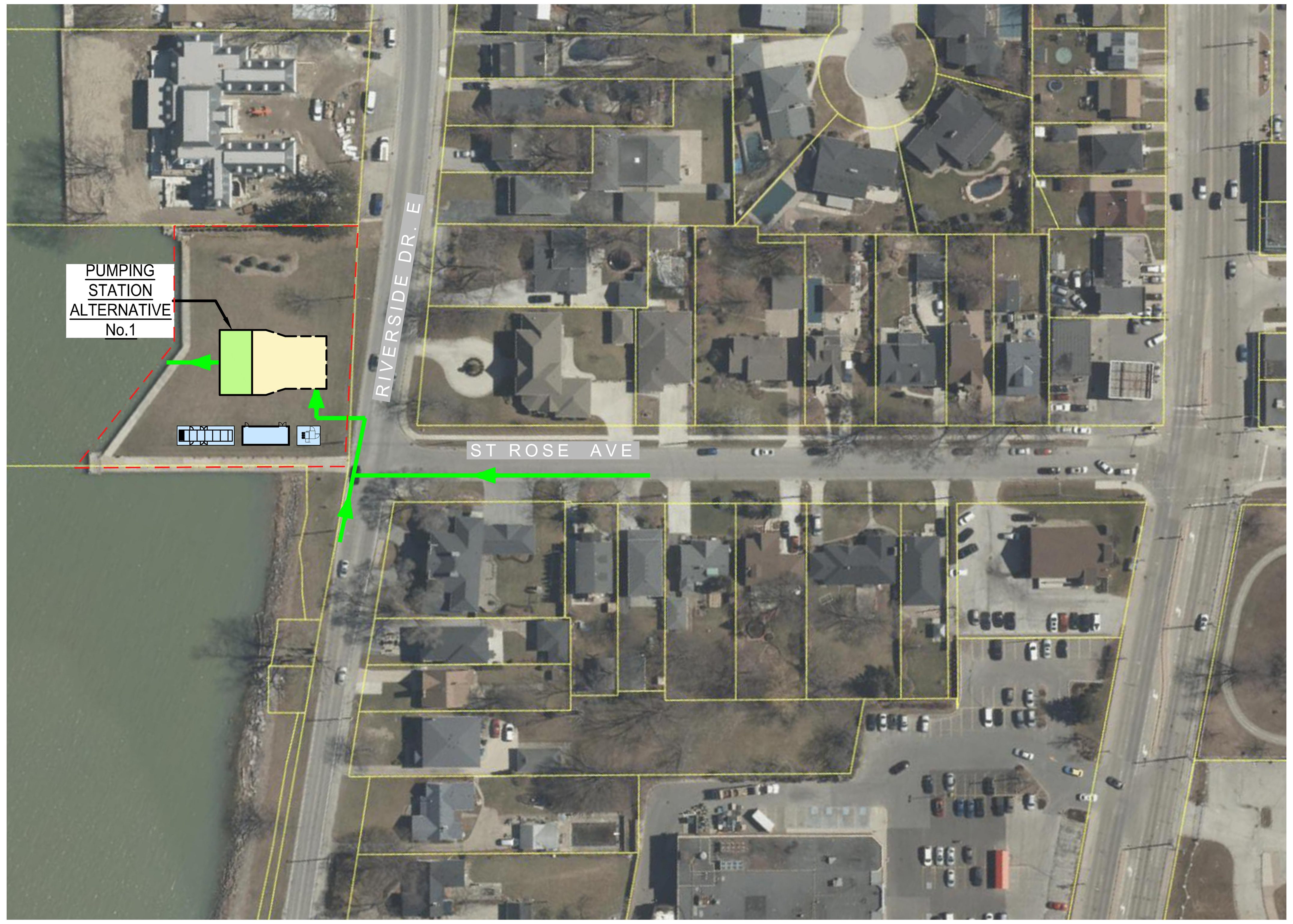
Figure 3-1: Location and General Layout for Alternative Locations

Figure 3-2: Proposed Layout for Alternative No. 1

Figure 3-3: Proposed Layout for Alternative No. 2

Figure 3-4: Proposed Layout for Alternative No. 3

Figure 3-5: Proposed Layout for Alternative No. 4



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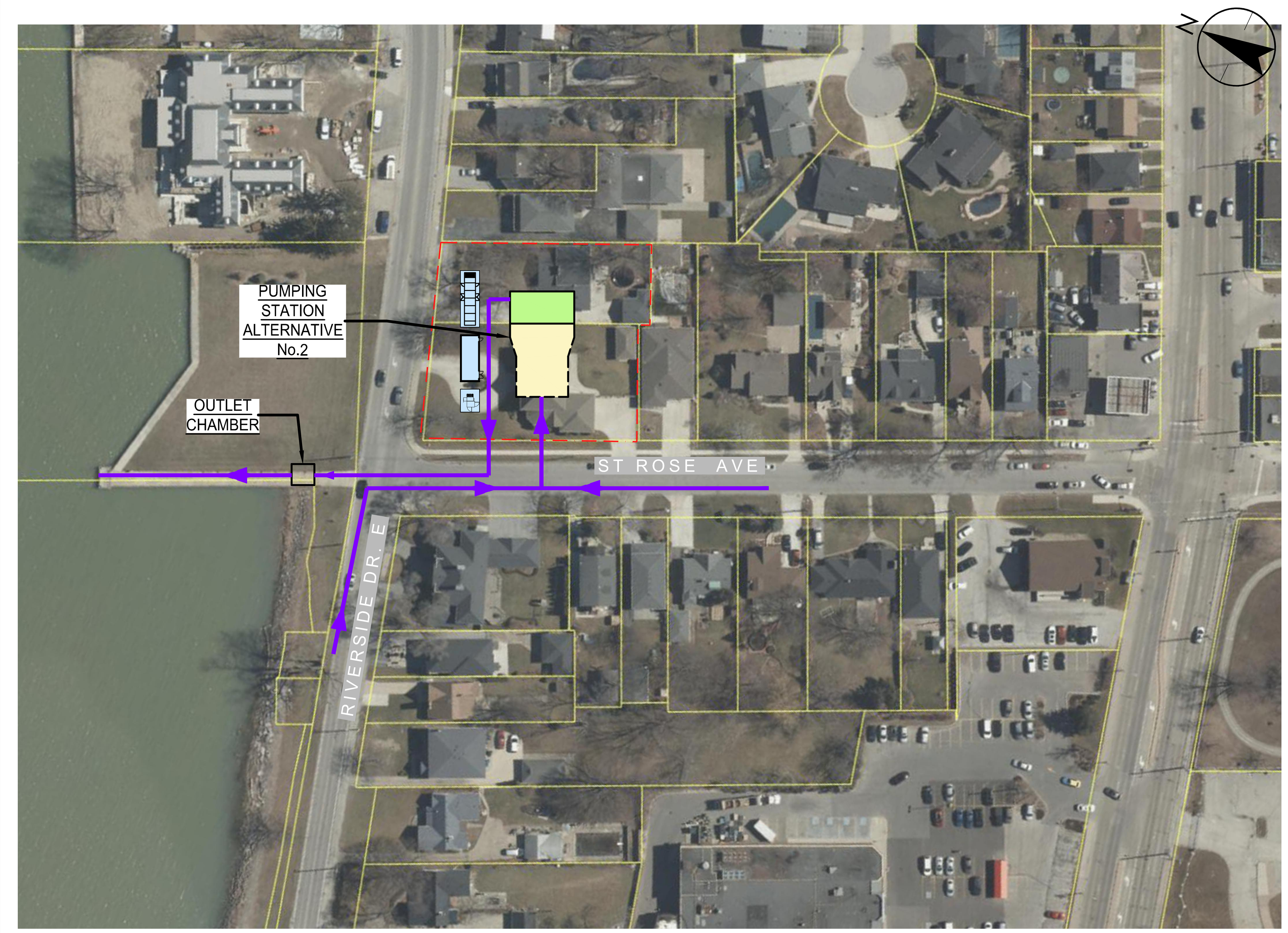

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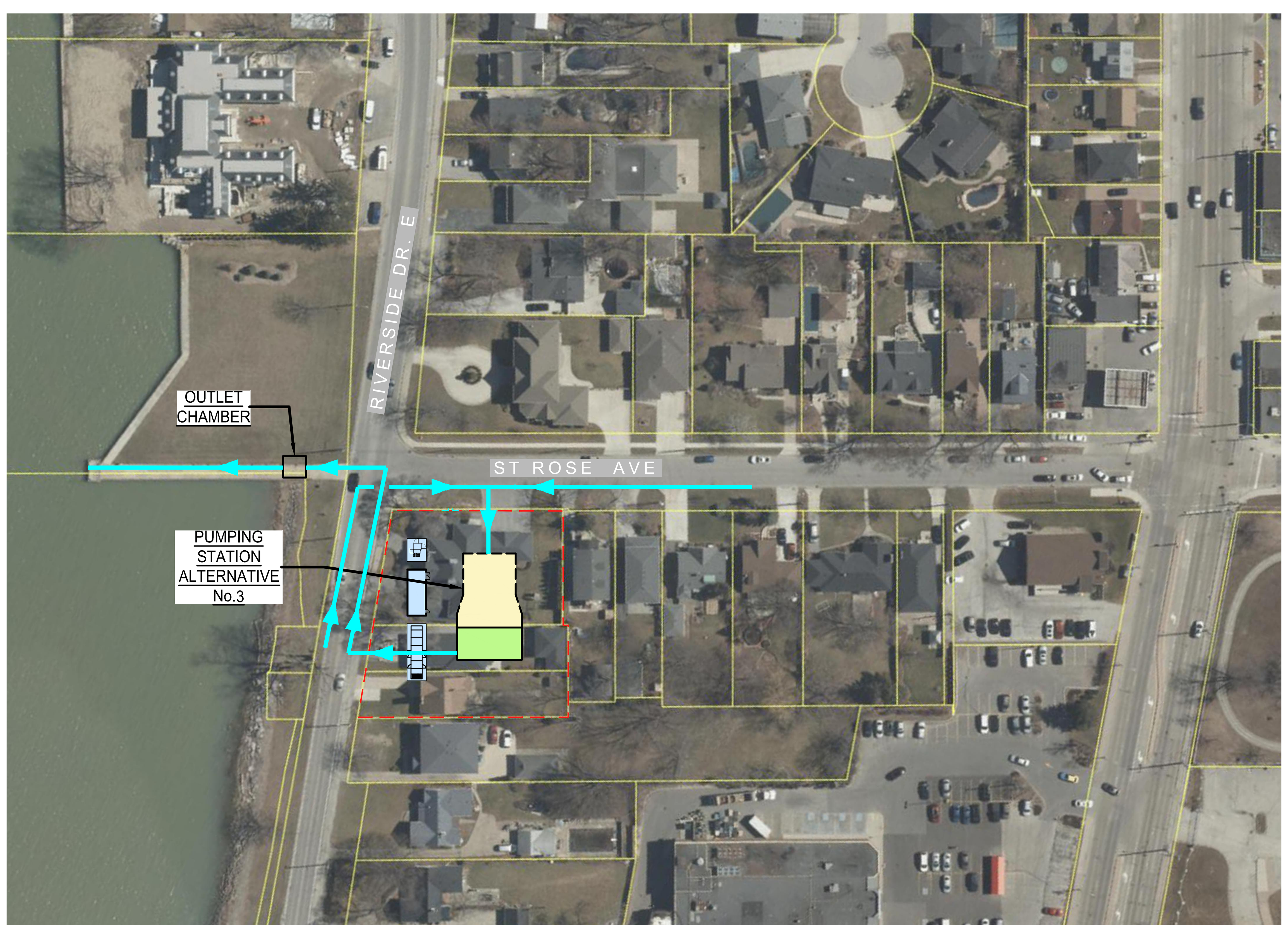

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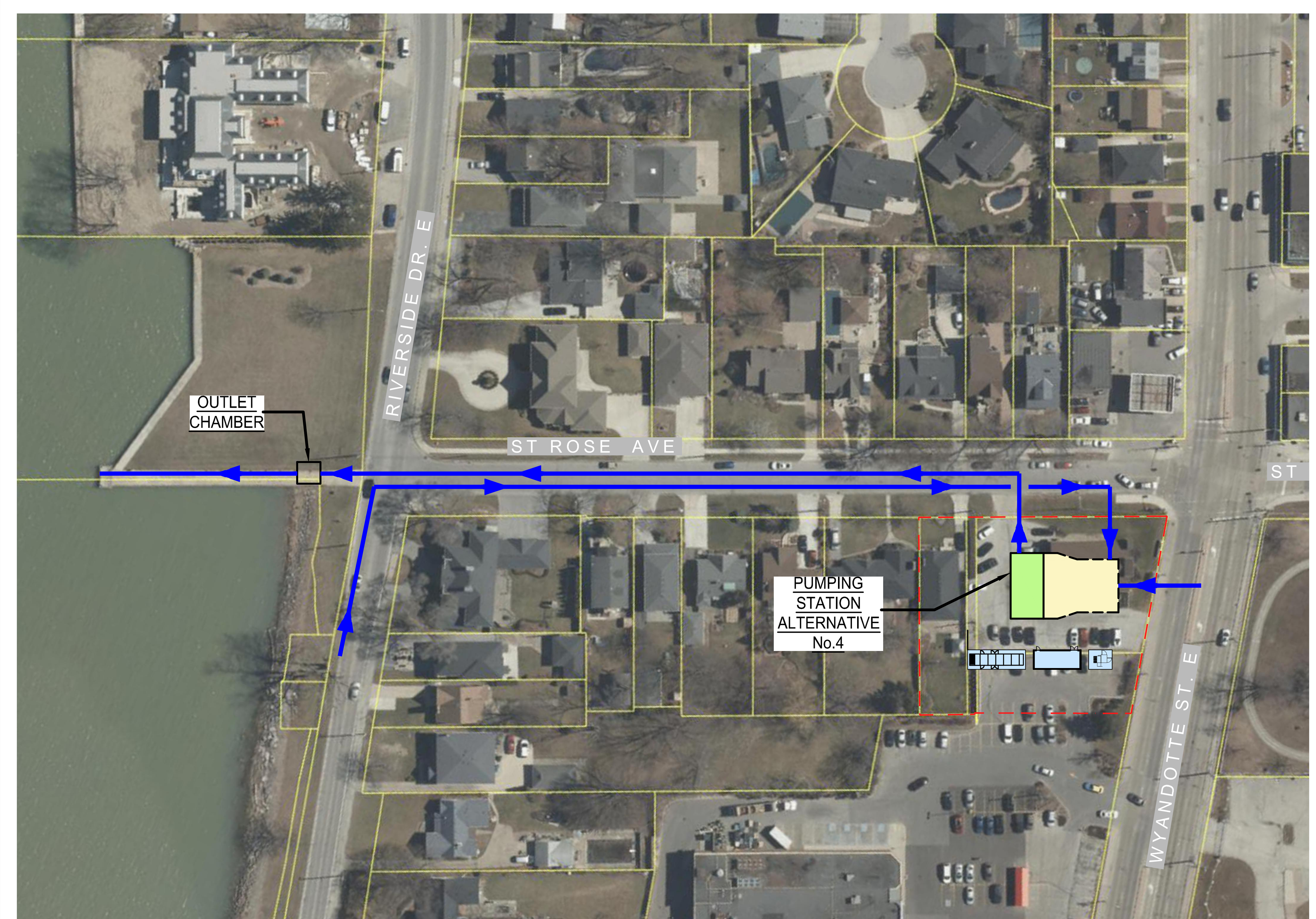

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Client/Project
CORPORATION OF THE CITY OF WINDSOR
ST. ROSE STORM WATER PUMPING STATION

NEW PUMPING STATION

City of Windsor, Ontario

Title
SITE PLAN
ALTERNATIVE LOCATIONS

Project No. 165620239
Scale AS SHOWN
Revision
Sheet
Drawing No.

Figure 3-1

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NEW PUMPING STATION

City of Windsor, Ontario

Title

SITE PLAN
ALTERNATIVE No.1

Project No. 165620239

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Revision Sheet

Drawing No.

Figure 3-2

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NEW PUMPING STATION

City of Windsor, Ontario

Title

SITE PLAN
ALTERNATIVE No. 2

Project No. 165620239

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Drawing No.

Figure 3-3

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ST. ROSE STORM WATER PUMPING STATION

NEW PUMPING STATION

City of Windsor, Ontario

Title

SITE PLAN
ALTERNATIVE No. 3

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Drawing No.

Figure 3-4

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NEW PUMPING STATION

City of Windsor, Ontario

Title
SITE PLAN
ALTERNATIVE No.4

Project No. 165620239
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Drawing No.

Figure 3-5

APPENDIX C: 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 Open House No. 1
8. Response from Public – Public Open House No. 1
9. Response from Review Agencies – Public Open House No. 2
10. Response from Public – Public Open House No. 2
11. Response from Review Agencies – Notice of Draft ESR
12. First Nations Consultation

APPENDIX C

Notice of Study Commencement

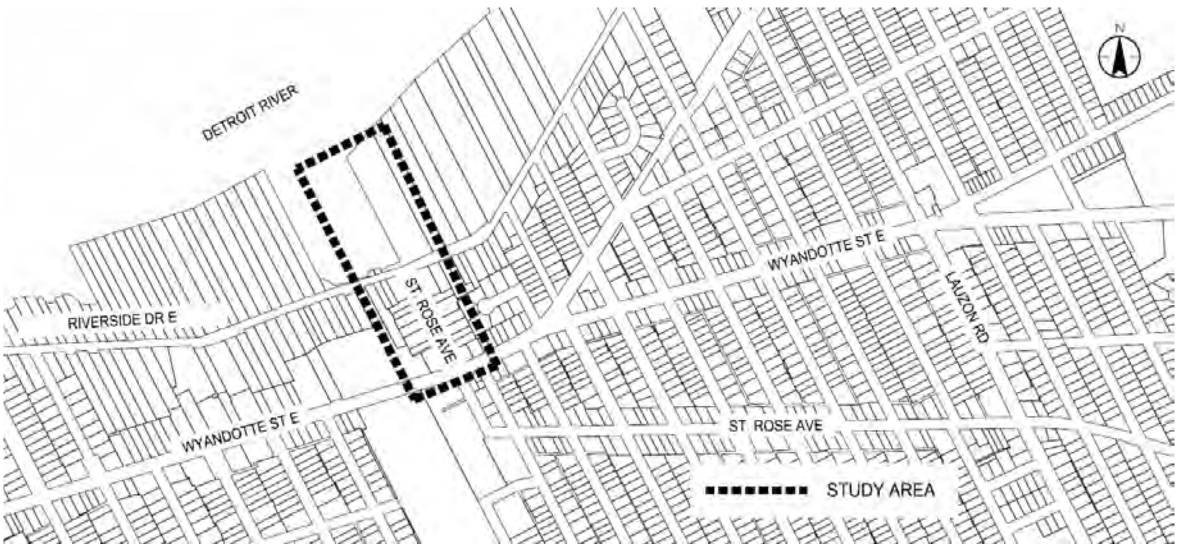
1. Notice of Study Commencement
2. Notice of Study Commencement – Windsor Star Advertisement

ST. ROSE STORMWATER PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF STUDY COMMENCEMENT

The City of Windsor is undertaking a Schedule C Municipal Class Environmental Assessment (Class EA) for the proposed St. Rose Pumping Station. This study will satisfy Phases 3 and 4 of the Class EA process which will involve the evaluation of site selection and alternative design concepts for the proposed St. Rose Stormwater Pumping Station. An Environmental Study Report will be prepared to document the activities and recommendations from the Class EA process.

The City of Windsor endorsed its first comprehensive Sewer and Coastal Flood Protection Master Plan (SMP) in 2020. The SMP was completed in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment process. The SMP identified specific improvement projects that can be undertaken by the City to improve efficiency and reduce the risk of flooding caused by severe storm events. It is outlined in the SMP that a new stormwater pumping station within the study area (refer to key map) is required to discharge excess water during major storm events in the expanded St. Rose drainage area.



This Notice of Study Commencement continues the public consultation process for this project. Following this Notice, the public will be invited to a Virtual Public Information Centre (PIC) to review the evaluation of site selection and to submit any questions and comments.

If you have any questions or if you wish to be added to the study mailing list, please contact:

Janelle Coombs, P.Eng.
Project Administrator, City of Windsor
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Windsor, ON N9A 6S1
519-255-6100 x 6004
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Jian Li, Ph.D., P. Eng.
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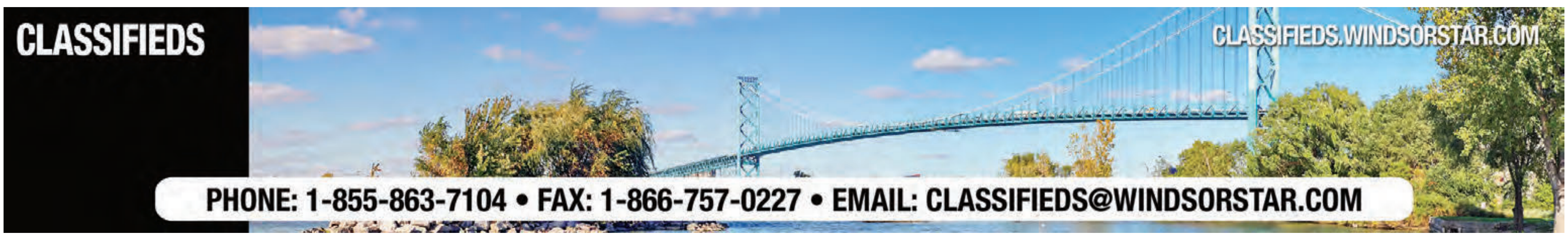
jian.li@stantec.com

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.



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Public Notices

EWSWA Essex-Windsor Solid Waste Authority

REQUEST FOR PROPOSALS

Engineering and Construction of a Concrete Push Wall Extension in Transfer Station #2 located in Kingsville, Ontario

Details: http://www.ewswa.org/about/business-opportunities-bids/

Closing Date and Time:
Thursday, February 17, 2022 at 2:00 pm.

THE CITY OF WINDSOR

ST. ROSE STORMWATER PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF STUDY COMMENCEMENT

The City of Windsor is undertaking a Schedule C Municipal Class Environmental Assessment for the proposed St. Rose Stormwater Pumping Station. The Sewer and Coastal Flood Protection Master Plan identifies the need for the new pumping station in order to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose area.

All content and instructions on how to submit questions or how to be added to the study mailing list will be available on the City of Windsor's project webpage, https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.asp

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Construction & Trades

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PRODUCTION ASSOCIATE

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- Completes any other assignments, duties and projects that may be assigned

QUALIFICATIONS:
- High School Diploma or equivalent (GED)
- Ability to work off-shifts/weekends
- Should have reliable transportation
- Starting at $16.73, Production Associates can make up to $20.24 within the first year
- The Leggett & Platt Automotive Group, an operating unit within Leggett & Platt Inc. a S&P 500 Company, is seeking a dynamic career minded individual to join our team. We provide outstanding opportunities for career satisfaction

We are filling all shifts, however preference will be given to candidates seeking afternoon/midnight shifts.

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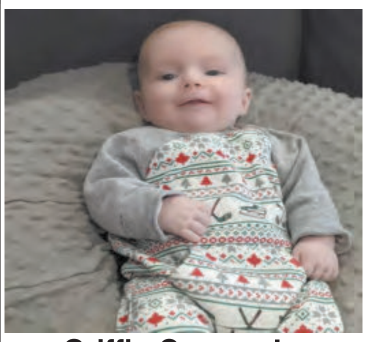
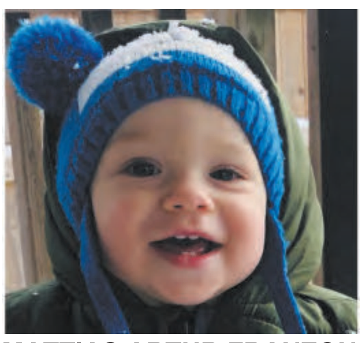
Babies of the Year



Griffin Carnevale
Born September 6, 2021
Parents Mary-Kate and Derek

Babies of the Year

Noa Harrington
Born July 19, 2021
Parents Shawn and Marissa



MATTIAS ARTUR FRANZON
Born January 15, 2021
Son of Bjorn & Susan Franzon (nee De Cecco)
Siblings: Charlotta, Evelina, Katarina & Bjorn

Sawyer Colucci
Born January 8th, 2021
Parents Andrew and Mandy

POSTMEDIA SOLUTIONS

Celebrating
Add your message to the Celebrations guestbook at **classifieds.windsorstar.com** and share with Facebook and Twitter!

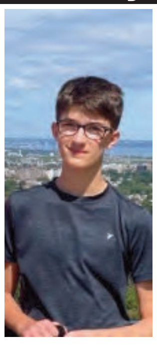
Birthdays

Birthday

Ryan J. Polidori
Happy 21st Birthday on January 31st!
Thank you for always keeping us entertained and always making us proud:)

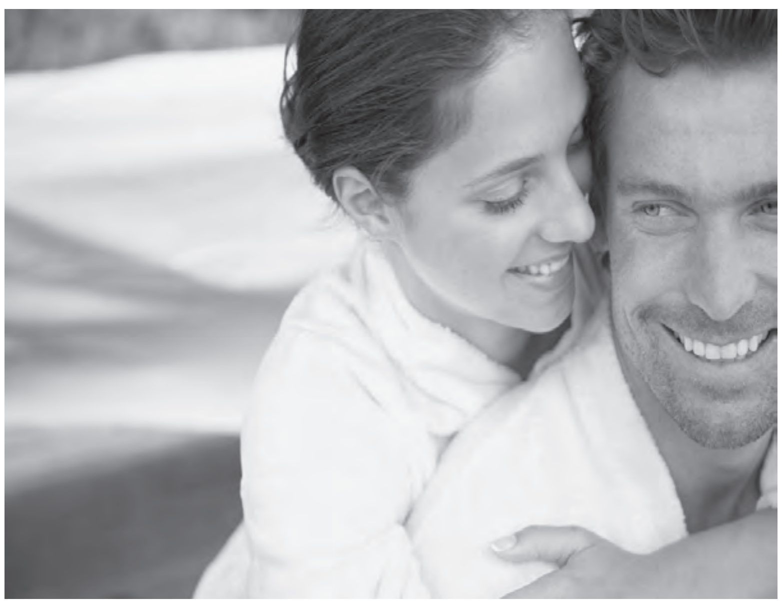
Love Mom, Dad & Jason

Birthday



Noah Gebauer
Happy 16th Birthday (January 31st).
What a wonderful young man you have become.
Love, Nonna Giuliana and smiling down from heaven Nonno Ernesto.

Let us in on your BIG NEWS...
• Birth • Engagement
• Wedding
•Graduation
• Retirement



APPENDIX C

Public Information Centre No. 1

1. Notice of Public Information Centre No. 1
2. Notice of PIC No. 1 – Windsor Star Advertisement
3. PIC No. 1 – Sign In Sheet
4. PIC No. 1 – Feedback Form
5. PIC No. 1 – Presentation

ST. ROSE STORMWATER PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE

The City of Windsor is undertaking a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the proposed St. Rose Pumping Station. This study will satisfy Phases 3 and 4 of the Class EA process which will involve the evaluation of site alternatives and design concept alternatives for the proposed St. Rose Stormwater Pumping Station. An Environmental Study Report will be prepared to document the activities and recommendations from the Class EA process. The City of Windsor endorsed its first comprehensive Sewer and Coastal Flood Protection Master Plan (SMP) in 2020. The SMP was completed in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment process. It outlined that a new stormwater pumping station is required to discharge excess water during major storm events in the expanded St. Rose drainage area.

The City is hosting a Public Information Centre (PIC) to present the evaluation of site alternatives for the St. Rose Pumping Station. 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 2, 2022
3:00 p.m. – 7:00 p.m.
WFCU Centre, Michigan Room
8787 McHugh Street, Windsor, ON

Information regarding this Environmental Assessment can be found on the City's project website:
https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

Following the PIC, comments are welcomed and will be received until March 17, 2022.

For further information, please contact:

Janelle Coombs, P.Eng.
Project Administrator, City of Windsor
350 City Hall Square West, Suite 310
Windsor, ON N9A 6S1
519-255-6100 x 6004
jcoombs@citywindsor.ca

Jian Li, Ph.D., P. Eng.
Stantec Consulting, Project Manager
2555 Ouellette Avenue, Suite 100
Windsor, Ontario N8X 1L9
519-966-2250 x 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.

In Memoriams

In Loving Memory Of Rolande Marie Vacheresse

In loving memory of a dear Wife, Mother, Grandmother, & Great grandmother who passed away eighteen years ago, February 20, 2004.

As the years go slowly by,
In all of the quiet times
Full of so many memories
Sometimes in the silence
I feel not so entirely alone.

Love, Louis, Margo, Cheryl, Darrel, Grandchildren & Great grandchildren

PROVENZANO, Rocco
February 25, 1964 - February 16, 2012

Time speeds on,
ten years have passed
Since death its gloom,
its shadow cast
Within our home,
where all seemed bright
And took from us a shining light,
We miss that light, and ever will,
His vacant place there is none to fill.
Down here we mourn,
but not in vain,
For up in heaven we will meet again.
Forever Loved - Mom and Dad

To a loving brother, brother-in-law, uncle, and great-uncle:

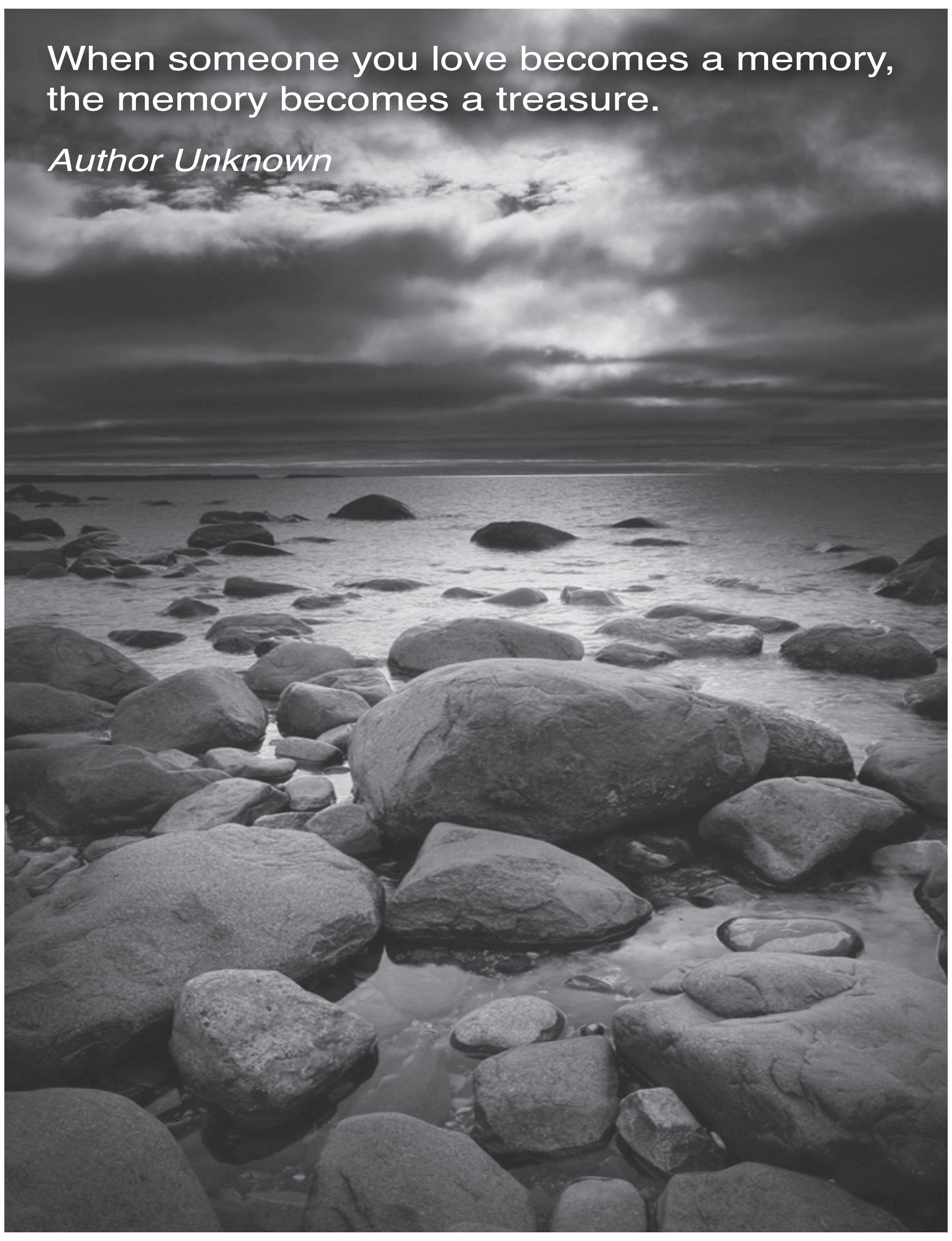
Gone is the face we loved so dear,
Silent is the voice we loved to hear,
Too far away for sight or speech,
But not too far for thought to reach,
Sweet to remember him
who once was here,
And who, though absent,
is just as dear.

Forever in our hearts,
Frank and Kelly, Antonella and Jim, and nephews Tory, Michael (Julia) and Brody

BORMANN, Gerda

Today I remember all the wonderful birthdays we had together
HAPPY BIRTHDAY MOM,
Love Ellen

Stories, pictures and tributes to life
REMEMBERING.CA



Public Notices

THE CITY OF WINDSOR

ST. ROSE STORM WATER PUMPING STATION CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE

The City of Windsor is undertaking a Schedule 'C' Municipal Class Environmental Assessment for the proposed St. Rose Stormwater Pumping Station. This study will satisfy Phases 3 and 4 of the Class EA process.

The City is hosting a Public Information Centre (PIC) to present the evaluation of site alternatives for the St. Rose Pumping Station and receive input from interested residents and stakeholders. The PIC will be held on Wednesday March 2, 2022 (3:00 to 7:00 pm) at the WFCU Centre, 8787 McHugh Street, Windsor, ON.

Additional details regarding the PIC are available on the City of Windsor's project webpage: https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

Legal & Tender Notices

NOTICE TO CREDITORS

TAKE NOTICE that all persons having claims against the Estate of **LORRITAH CAROLINE DE AGUIAR,** late of the County Borough of the Vale of Glamorgan, Wales, who died on August 22, 2020. are hereby required to send to the undersigned Solicitors for the Estate Trustee, on or before February 28, 2022, full particulars of their claims, after which date the assets will be distributed, having regard only to claims of which notice shall then have been received.

Dated at Windsor, Ontario, this 4th day of February, 2022.

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Solicitors for the Estate Trustee

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Careers

John McGivney Children's Centre School Authority

JOHN MCGIVNEY CHILDREN'S CENTRE

Director of Client Services

1 Permanent Vacancy

Salary Range ($108,163 – $121,871) Hours of Work – 37.5 hours per week

The John McGivney Children's Centre provides family-centered paediatric therapy services in the Windsor-Essex County community, enriching the lives of children and youth with special needs by helping them reach their full potential. Reporting to the CEO, and as a member of the senior management team, the Director of Client Services will provide effective leadership and oversight of the clinical services and quality management teams, as well as programs and services, in accordance with the organizational mission, vision, goals, strategic plan, and funding agreements. They will facilitate positive change management and continuous improvement as a core job responsibility and during the current sector transformation; and will play a key role in our growing and expanding operations.

The Director of Client Services will ensure ongoing development and maintenance of an effective multi-disciplinary team and service delivery program across core rehabilitation including Centre-based and school-based services, as well as autism services including core and fee-for-service. They will work with the senior management team and clinical services management team in order to identify Centre-wide needs, assign appropriate responsibility, and implement services. They will participate in the Board's strategic planning exercise bringing the perspective of client services, and assist the CEO in delivering on the Centre's strategic priorities. They will be responsible for leading the annual operational planning process for client services, developing goals and outcomes in line with the Board's strategic plan.

The Director of Client Services will also be responsible for identifying new programs and continuous improvement opportunities, and service innovations, in order to ensure that clinical programs remain evidence-based, family-centered, and inclusive. They will fulfill responsibilities as the senior management team lead, with the Board's Quality Committee and the Family Advisory Council, and other assigned Centre committees. They will attend Board meetings and Board Committee meetings as required; and act as an ambassador for JMCC within the community, representing JMCC at various community and sector tables and working groups. Working in collaboration with the Director of Finance and Administration, they will be responsible to identify service delivery priorities for budgeting of staffing complements and program expenditures; develop, implement and evaluate program plans to meet organizational goals; and ensure compliance with accreditation standards. The Director of Client Services will also oversee the Quality department, and the development and management of systems to monitor client outcomes to ensure evidence-based effectiveness, high quality, and timeliness of service delivery. Finally, the Director of Client Services is responsible for Privacy controls and Health and Safety recommendations, plans, and measures of effectiveness

Qualifications:
The successful candidate will have a Master's degree or equivalent, in a related professional health field. A minimum of 5-7 years' experience in a relevant management position in progressively responsible roles is required. They will have a demonstrated understanding of disability, rehabilitation, children's services, autism, or related fields and ability to maintain awareness of evolving trends. Clinical or management experience in paediatric rehabilitation is an asset. Experience working in government or public sector organizations is also considered an asset. The successful candidate will have the ability to collaborate and maintain excellent relationships with staff at all levels of the organization including the Centre's Board of Directors. They will have experience working with a broad range of stakeholders to inform decision making, with attention to tact, discretion, and diplomacy. They will have superior knowledge of clinical best practices and outcome based evaluation; and be able to translate strategic objectives into concrete plans. Demonstrated success in design, implementation and evaluation of programs and services, as well as in leading, coaching and mentoring others, team building, employee development, relationship building, and conflict resolution is required. They should have extensive experience writing reports, proposals, policies and processes. Superior written and verbal communication skills using a variety of formats and directed to a range of audiences, with exceptional attention to detail is necessary. They should also have excellent planning, organizational, analytical and critical thinking skills; as well as solution-focused and ethical problem solving skills.

The candidate must also comply with JMCC's COVID-19 Immunization Policy.

Please submit your resume and cover letter no later than 4:00 p.m. on February 25, 2022 to:
John McGivney Children's Centre
Human Resources Department hr@jmccentre.ca

JMCC is committed to equity and diversity in the delivery of services and our work environment. Members from equity-seeking groups including Women, Indigenous Persons, Members of Racialized Groups, Persons with Disabilities and Persons of Diverse Gender Identities, Gender Expressions and Sexual Orientations, and groups protected by the Ontario Human Rights Code are encouraged to apply and to self-identify in their resume and/or cover letter. JMCC is committed to a recruitment process and work environment that is inclusive and barrier free. Should interested candidates require accommodations at any time during the recruitment process, please advise us of the nature of the accommodation(s) as soon as possible. ~Helping Abilities Grow~

To place your employment ad call 1-877-750-5054, email classifieds@postmedia.com or go to working.windsorstar.com and select + List a Job

VIRTUAL
PUBLIC INFORMATION CENTRE
COMMENT FORM

ST. ROSE STORMWATER PUMPING STATION

To address widespread flooding issues during extreme storm events, the City completed a comprehensive study known as the Sewer & Coastal Flood Protection Master Plan (SMP). The SMP identified the need for a new stormwater pumping station and new storm sewer outlet to the Detroit River to service the St. Rose drainage area. The City is undertaking the Municipal Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will determine the location and overall design concept of the proposed pumping station for the St. Rose drainage area.

THANK YOU

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 project website below:

https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

Please return your completed comment form on or before March 17, 2022, to:

Chrissy Jung, M.A.Sc., E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 519-567-9537
chrissy.jung@stantec.com

Stantec

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

NAME

EMAIL ADDRESS

TELEPHONE NO. (   )

DATE SIGNATURE

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.

City of Windsor

St. Rose Stormwater Pumping Station

PUBLIC INFORMATION CENTER

WELCOME

Municipal Class Environmental Assessment (Class EA)

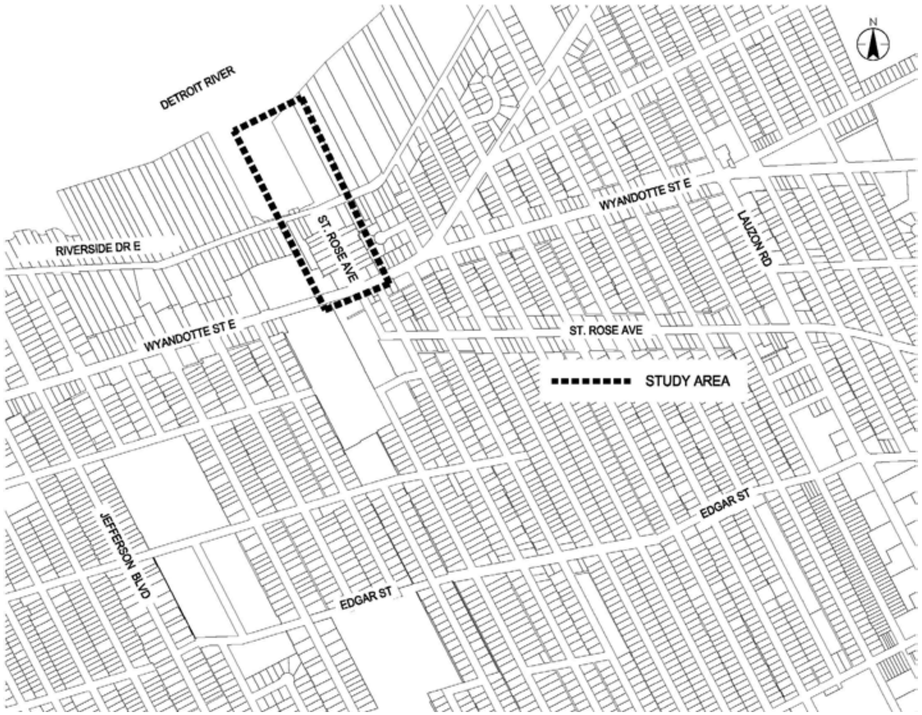
March 2022

Study Overview

The purpose of this study is to determine the preferred location and design for the St. Rose stormwater pumping station and storm sewer outlet.

The purpose of this Public Information Center (PIC) is to:

- Present a further evaluation of the four site alternatives identified in the Sewer & Coastal Flood Protection Master Plan (SMP)
- Obtain public feedback on the preferred location of the proposed St. Rose Stormwater Pumping Station



Flooding in the City of Windsor

The City of Windsor has experienced several significant storm events in recent years that have resulted in widespread flooding.

WINDSOR STAR

Rainfall 'deluge' triggers flooding, road closures

With widespread reports of flooding and roads being under water, the city on Friday was urging residents to stay off...

July 16, 2021 **Local News**

WINDSOR STAR

Windsor flooding makes list of Top 10 weather events in 2017

Windsor has made Environment Canada's national list of Top 10 weather events in 2017 for the massive storm in lat...

December 21, 2017 **Local News**

To address these issues the City carried out a comprehensive study. The purpose of the SMP was to:

- Understand the causes of flooding
- Identify locations of basement, surface, and coastal flooding
- Evaluate alternative solutions
- Complete high-level design and cost estimates for proposed infrastructure improvements
- Provide an implementation strategy for the recommended solutions

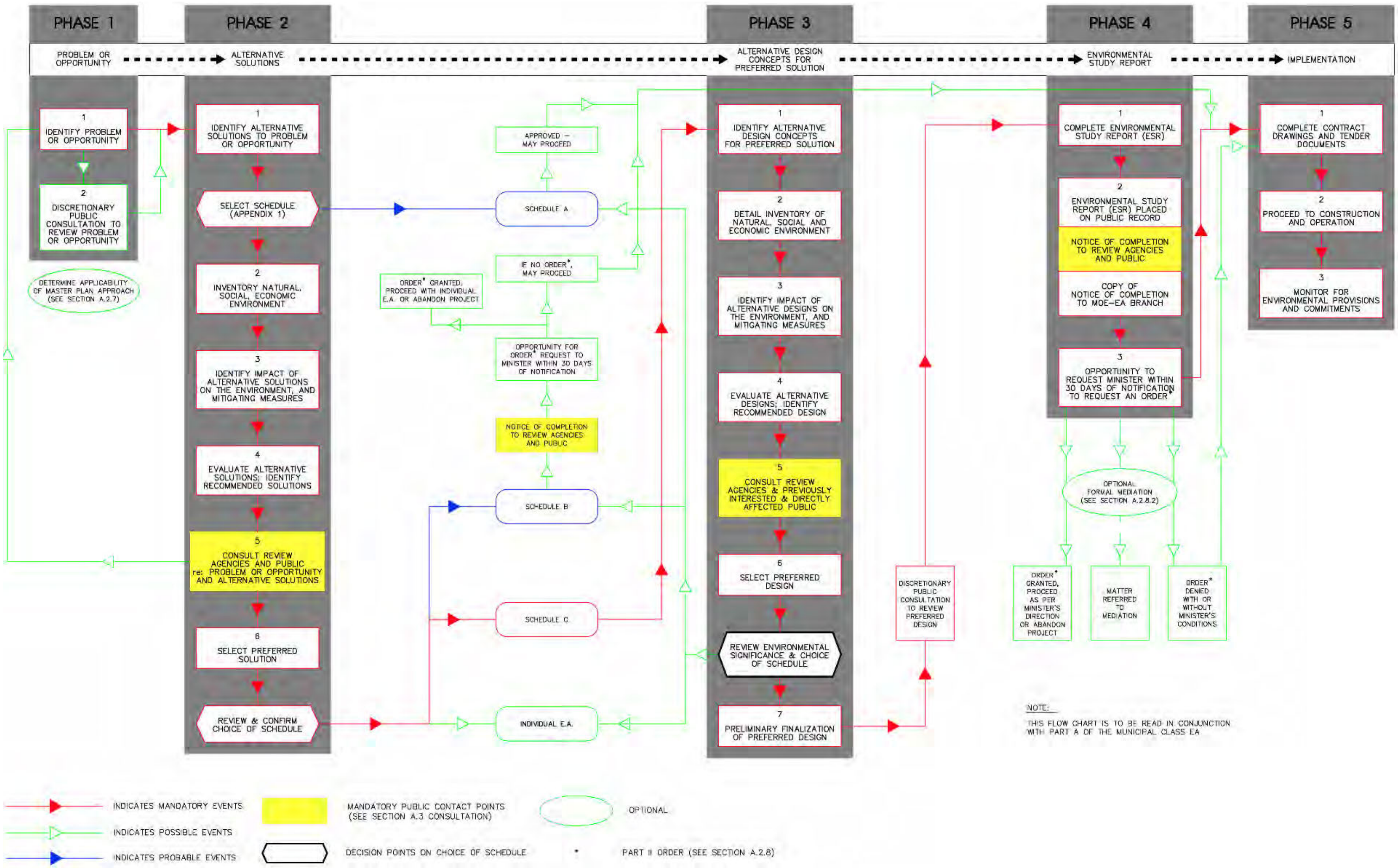
Problem Statement

- The SMP identified the St. Rose drainage area as a problem area due to the:
  - High potential for basement flooding (significant risk to homes in the event of a 1 in 5-year storm event)
  - History of surface level flooding during storm events
  - Risk of coastal flooding due to proximity to the Detroit River
- The existing gravity outlet sewer is unable to handle wet weather flows during severe storm events.
- Failure to have adequate infrastructure in place will negatively impact the community and may cause damage to infrastructure, properties, and local transportation networks.

Existing Storm Sewer Outlet in St. Rose Beach Park

- The existing stormwater sewer outlet is located beneath the paved walkway in the St. Rose Beach Park
- The outlet provides service for the stormwater collected from foundation drains, roof drains, and catch basins
- The proposed pumping station will service the St. Rose drainage area to prevent flooding during severe storm events

Overview of the Class EA Process



Key Features of the Class EA Process

The project is being conducted in accordance with the Class EA requirements for ‘Schedule C Projects’, which is to be approved subject to completion of the following Class EA process:

Municipal Class EA Phases	
Phase 1 – Review and identify problem or opportunity	SMP
Phase 2 – Alternative solutions to problem	SMP
Phase 3 – Alternative design concepts for the preferred solution	This EA Study
Phase 4 – Environmental Study Report	This EA Study
Phase 5 – Implementation of the preferred design	Future Work

Phase 1 and Phase 2 of the Class EA – Completed

The SMP was undertaken and completed in accordance with Phases 1 and 2 of the Class EA process.

The need to improve current flooding conditions in the Riverside Area was identified. After consultation with review agencies and the public, the preferred solution was determined to be:

- ***A new stormwater pumping station near the location of the existing St. Rose gravity outlet***

- ***Designed with a capacity of 13.5 m^3/s to provide service for a 1 in 100-year storm event***

Phase 3 and 4 of the Class EA – Ongoing

This study will be undertaken and completed in accordance with Phases 3 and 4 of the Class EA process.

Phase 3 of the Class EA process for this study will include:

- Review of alternative locations for the St. Rose stormwater pumping station
- ***This open house is being held to obtain comments and public input on the site location***
- Identify the preferred location
- Evaluation and selection of the preferred design for the St. Rose stormwater pumping station and sewer outlet

Phase 4 of the Class EA for this study will include:

- Preparation and submission of an Environmental Study Report

Evaluation Criteria for Site Selection

Evaluation criteria for the comparative location analysis are as follows:

Technical:

- Ability to Meet Flood Mitigation Objectives
- Flexibility to Adapt to Climate Change
- Coastal Flood Risk
- Anticipated Maintenance Requirements
- Length of Time Required for Implementation
- Complexity of Installation and Operation
  - Pumping Station Wet Well and Equipment
  - Pumping Station Excavation Dewatering
  - Excavation Material
  - Demolition of Existing Structures
  - Storm Sewer Installation
  - Extent of Existing Utility Relocation

Economic:

- Relative Capital Cost
- Relative Operation and Maintenance (O&M) Cost

Natural Environment:

- Impacts to the Natural Environment
- Better Use of Existing Infrastructure

Social:

- Disruption During Construction
- Impacts to Archaeological, Built Heritage, and Cultural Heritage
- Development Policies / Agreements
- Permanent Changes to Urban Community
  - Noise and Vibration Impacts
  - Displacement of Existing Residents and Businesses
  - Disruption to Waterfront Parkland
  - Disruption to Waterfront Views

Evaluation Process for Site Selection

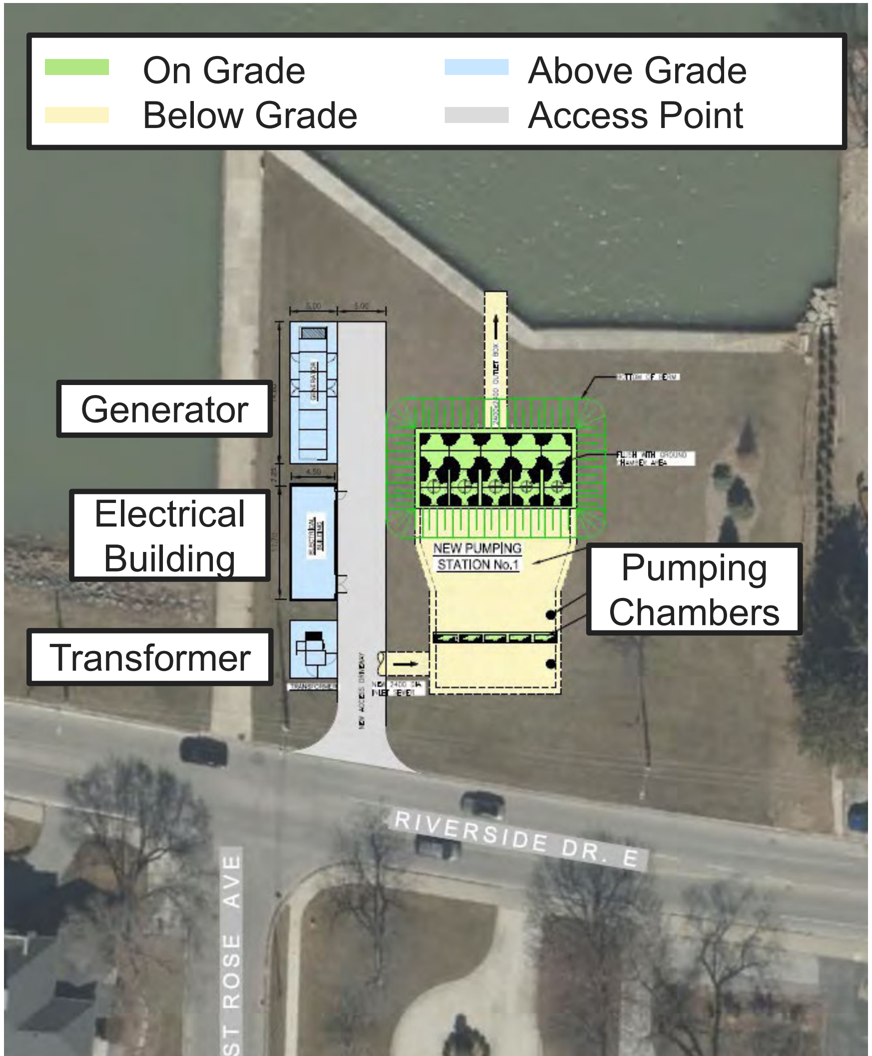
This EA study undertook a more project specific evaluation compared to the process from the Sewer master plan study.

Project specific evaluation:

- In-depth assessment for each evaluation criteria from the SMP
- Preliminary geotechnical and archaeological investigations
- Detailed review of the complexity of installation and operation
- Further analysis for the relative capital cost
- Consideration of additional evaluation criteria
    - Development policies and agreements
    - Relative operations and maintenance cost
    - Better use of existing infrastructure

Site Alternative No. 1

St. Rose Beach Park on the north side of Riverside Drive



Preliminary Layout (Subject to Change)

Technical:
- Able to meet flood mitigation objectives
- Space for expansion (adapt to climate change)
- Resilient to coastal flooding
- Simple outlet maintenance
- Minimal time for implementation
- Simple installation and operation

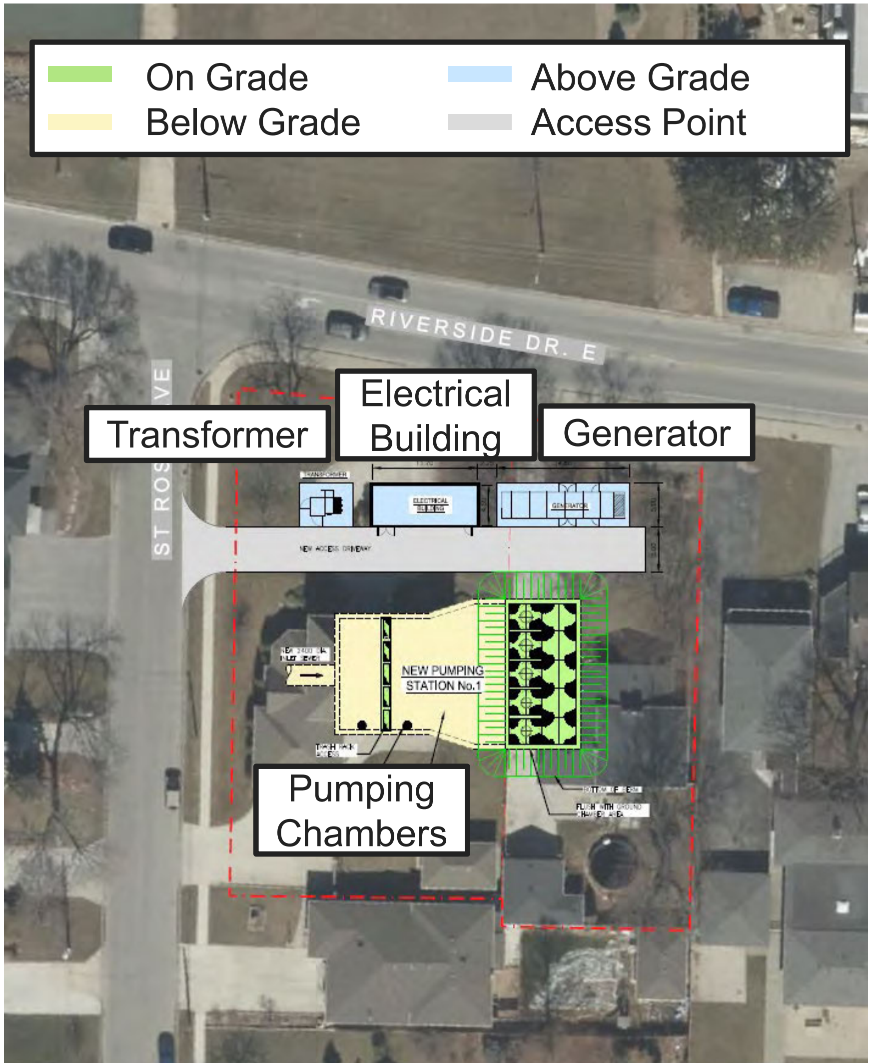
Economic:
- Lowest capital cost
- Lowest pumping head → Lowest O&M cost

Natural Environment:
- Minimal impacts to natural environment
- Better use of existing infrastructure

Social:
- Minimal disruption during construction
- Minimal to no archaeological impacts
- Match built heritage and cultural heritage of the community
- Minimal noise and vibration impacts → greatest distance from residential properties
- No displacement of existing residents
- Some disruption to waterfront parkland
- Some disruption to waterfront views

Site Alternative No. 2

Southeast corner of Riverside Drive and St. Rose Avenue



Preliminary Layout (Subject to Change)

Technical:

- Able to meet flood mitigation objectives
- Reduced ability to adapt to climate change
- Resilient to coastal flooding
- Moderate outlet maintenance
- Longer time for implementation
- Moderate installation and operation

Economic:

- Increased capital cost
- Increased pumping head → increased O&M cost

Natural Environment:

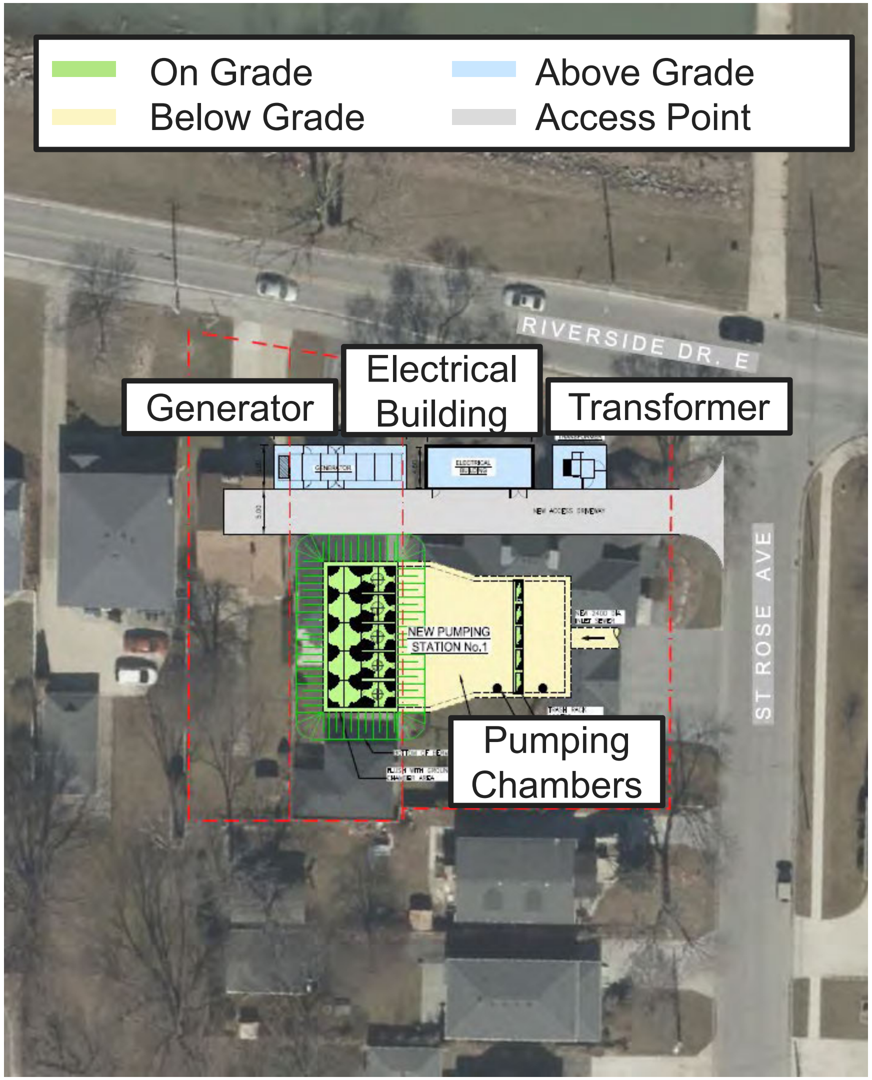
- Minimal impacts to natural environment
- Impacts to existing infrastructure

Social:

- Increased disruption during construction
- Minimal to no archaeological impacts
- Match built heritage and cultural heritage of the community
- Noise and vibration impacts → shortest distance from residential properties
- Displacement of two (2) existing residents
- No disruption to waterfront parkland
- No disruption to waterfront views

Site Alternative No. 3

Southwest corner of Riverside Drive and St. Rose Avenue



Preliminary Layout (Subject to Change)

Technical:
- Able to meet flood mitigation objectives
- Reduced ability to adapt to climate change
- Resilient to coastal flooding
- Moderate outlet maintenance
- Longer time for implementation
- Moderate installation and operation

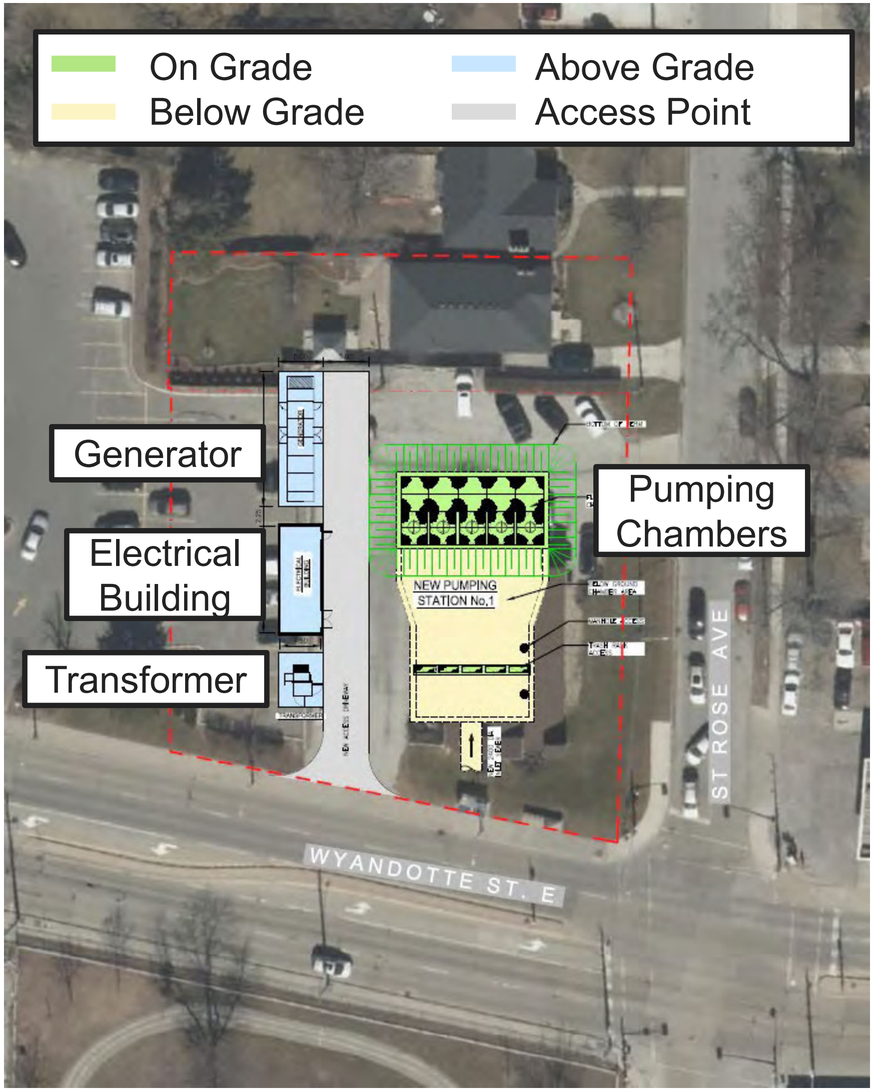
Economic:
- Increased capital cost
- Increased pumping head → increased O&M cost

Natural Environment:
- Minimal impacts to natural environment
- Impacts to existing infrastructure

Social:
- Increased disruption during construction
- Minimal to no archaeological impacts
- Match built heritage and cultural heritage of the community
- Noise and vibration impacts → shortest distance from residential properties
- Displacement of three (3) existing residents
- No disruption to waterfront parkland
- No disruption to waterfront views

Site Alternative No. 4

Northwest corner of Wyandotte Street and St. Rose Avenue



Preliminary Layout (Subject to Change)

Technical:

- Able to meet flood mitigation objectives
- Reduced ability to adapt to climate change
- Resilient to coastal flooding
- Complex outlet maintenance
- Longest time for implementation
- Complex installation and operation

Economic:

- Significantly increased capital cost
- Highest pumping head → Highest O&M cost

Natural Environment:

- Minimal impacts to natural environment
- Large impact to existing infrastructure

Social:

- Increased disruption during construction
- Minimal to no archaeological impacts
- Match built heritage and cultural heritage of the community
- Noise and vibration impacts → short distance from residential properties
- Displacement of one business and one resident
- No disruption to waterfront parkland
- No disruption to waterfront views

Preliminary Rendering of the St. Rose Stormwater Pumping Station

Preliminary Rendering of the St. Rose Stormwater Pumping Station

Preliminary Rendering of the St. Rose Stormwater Pumping Station

Site Evaluation – Capital Cost Analysis

Item	Alternative No. 1 St. Rose Beach Park	Alternative No. 2 St. Rose Ave / Riverside Drive (Southeast Corner)	Alternative No. 3 St. Rose Ave / Riverside Drive (Southwest Corner)	Alternative No. 4 St. Rose Ave / Wyandotte Street (Northeast Corner)
Pumping Station and Outlet Structure	$22,000,000	$22,500,000	$22,500,000	$22,500,000
Linear Infrastructure **(Additional Storm Sewers Upstream and Downstream from Pump Station)**	Included in the Above Cost.	$800,000	$800,000	$6,000,000
Utility Relocation	N/A	N/A	N/A	$500,000
Building Demolition	N/A	$200,000	$300,000	$200,000
Total Capital Cost:	**$22,000,000**	**$23,500,000 + Acquisition of 2 Properties**	**$23,600,000 + Acquisition of 3 Properties**	**$33,200,000 + Acquisition of 2 Properties**

Site Evaluation – Summary

Ranking of Site Location Alternatives:

MOST PREFERRED	**ALTERNATIVE NO. 1** **ST. ROSE BEACH PARK**
↕	Alternative No. 2 & Alternative No. 3 Intersection of St. Rose Avenue and Riverside Drive
LEAST PREFERRED	Alternative No. 4 Intersection of St. Rose Avenue and Wyandotte Street

Preferred Site Location

Benefits of the St. Rose Beach Park Location

- No displacement of existing residents or businesses
- Able to meet flood mitigation objectives while mitigating undesirable social, economic, and environment impacts
- Flexible to adjust to climate change (room for potential expansion)
- Relatively straight forward construction, operation, and maintenance requirements
- Shortest construction duration
- Least disruption to residents/community during construction
- Lowest relative capital and operation cost

Impacts to the park use and riverside views can be mitigated through landscaping and architectural features that improve the aesthetics and function of the park allowing the community to enjoy physical activity, picnics, fishing, and other recreational activities in the space.

Moreover, disruption to the riverside view can be minimized by designing a portion of the pumping station at or below the ground level.

Next Steps

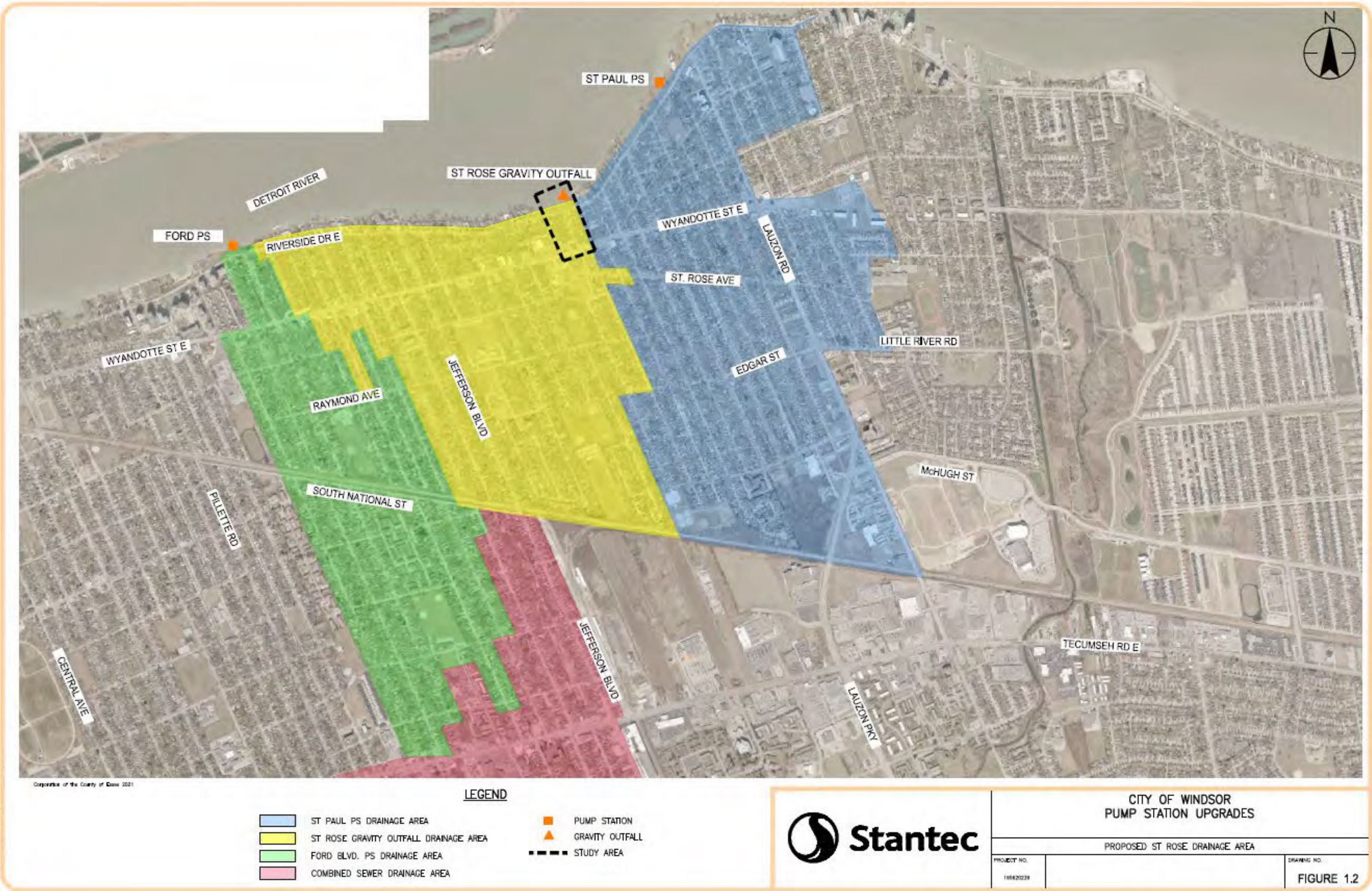
Project Component	Date
Council Presentation	Spring 2022
Evaluation of Alternative Design Concepts	Spring 2022
Public Information Centre No. 2 - Design Concepts	Summer 2022
Environmental Study Report	Summer 2022
Council Presentation	Fall 2022
Notice of Completion	Fall 2022

Thank You

Please visit the City of Windsor's project website to submit a feedback form.

[St. Rose Stormwater Pumping Station Environmental Assessment (citywindsor.ca)]

St. Rose Drainage Area



APPENDIX C

Public Information Centre No. 2

1. Notice of Public Information Centre No. 2
2. Notice of PIC No. 2 – Windsor Star Advertisement
3. PIC No. 2 – Sign In Sheet
4. PIC No. 2 – Feedback Form
5. PIC No. 2 – Presentation

ST. ROSE STORMWATER PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE No. 2

The City of Windsor is undertaking a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the proposed St. Rose Pumping Station. The City of Windsor endorsed its first comprehensive Sewer and Coastal Flood Protection Master Plan (SMP) in 2020. The SMP was completed in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment process. It outlined that a new stormwater pumping station is required to discharge excess water during major storm events in the expanded St. Rose drainage area. This study will satisfy Phases 3 and 4 of the Class EA process which will involve the evaluation of site alternatives and design concept alternatives for the proposed St. Rose Stormwater Pumping Station. An Environmental Study Report will be prepared to document the activities and recommendations from the Class EA process.

The City is hosting a second Public Information Centre (PIC) to present the design concept alternatives for the St. Rose Pumping Station. Consultation is an integral part of the class 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
Thursday June 23rd, 2022
3:00 p.m. – 7:00 p.m.
WFCU Centre, Michigan Room
8787 McHugh Street, Windsor, ON

Information regarding this Environmental Assessment can be found on the City's project website:
https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

Following the PIC, comments are welcomed and will be received until July 13th, 2022.

For further information, please contact:

Janelle Coombs, P.Eng.
Project Administrator, City of Windsor
350 City Hall Square West, Suite 310
Windsor, ON N9A 6S1
519-255-6100 x 6004
jcoombs@citywindsor.ca

Jian Li, Ph.D., P. Eng.
Stantec Consulting, Project Manager
2555 Ouellette Avenue, Suite 100
Windsor, Ontario N8X 1L9
519-966-2250 x 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.

Pet Supplies & Services

RIVARD ANIMAL HOSPITAL
519-974-PETS (7387)

HEARTWORM TEST@RIVARD ANIMAL HOSPITAL
Mon-Fri 9AM to 6PM, Sat 9.00AM-4PM 519-974-7387

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All Auto will buy!
Cash is king!
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(519)-999-8658

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Quick's Auto Towing & Wrecking
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POSTMEDIA SOLUTIONS

Truth be told.

CANADA'S NEWS MEDIA. CHAMPION THE TRUTH.

Public Notices

THE CITY OF WINDSOR ONTARIO, CANADA **Notice**

ST. ROSE STORM WATER PUMPING STATION
CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE No. 2

The City of Windsor is undertaking a Schedule 'C' Municipal Class Environmental Assessment for the proposed St. Rose Stormwater Pumping Station. This study will satisfy Phases 3 and 4 of the Class EA process.

The City is hosting its second Public Information Centre (PIC) to present the design concept alternatives for the St. Rose Pumping Station and receive input from interested residents and stakeholders. The PIC will be held on Thursday June 23, 2022 (3:00 to 7:00 pm) at the WFCU Centre, 8787 McHugh Street, Windsor, ON.

Additional details regarding the PIC are available on the City of Windsor's project webpage: https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

THE CITY OF WINDSOR ONTARIO, CANADA

CALL 311 WINDSOR CITY SERVICES | TTY: 1-866-488-9311 | www.citywindsor.ca

Celebrating

Add your message to the Celebrations guestbook at classifieds.windsorstar.com and share with Facebook and Twitter!

Anniversaries

Anniversary

Peter & Elizabeth Aalbers

Will be celebrating their 70th wedding anniversary. They were married in Blenheim on June 15, 1952, and eventually moved to a small farm in Olinda where they raised vegetables (and 7 children).
Best wishes from the whole family

Birthdays

Happy 90th Birthday

Marylin Landry

will be celebrating her 90th Birthday on Sunday June 12th 2022.
Please join Marylin and her family at an open house at the Riverside Sportsman Club on Sunday June 12th anytime between 1:30-4:00.
How lucky we are to be celebrating this day with such a beautiful lady.

Weddings

Rachel & Kevin are getting married today!

On June 11th, 2022, at 3:30pm

Rachel Gunner & Kevin Decaire

surrounded by friends & family, were united in marriage at their home in South Woodslee.
Love is what happens when two hearts find their happy place right beside each other.

Congratulations on your Wedding Day!

Other Celebrations

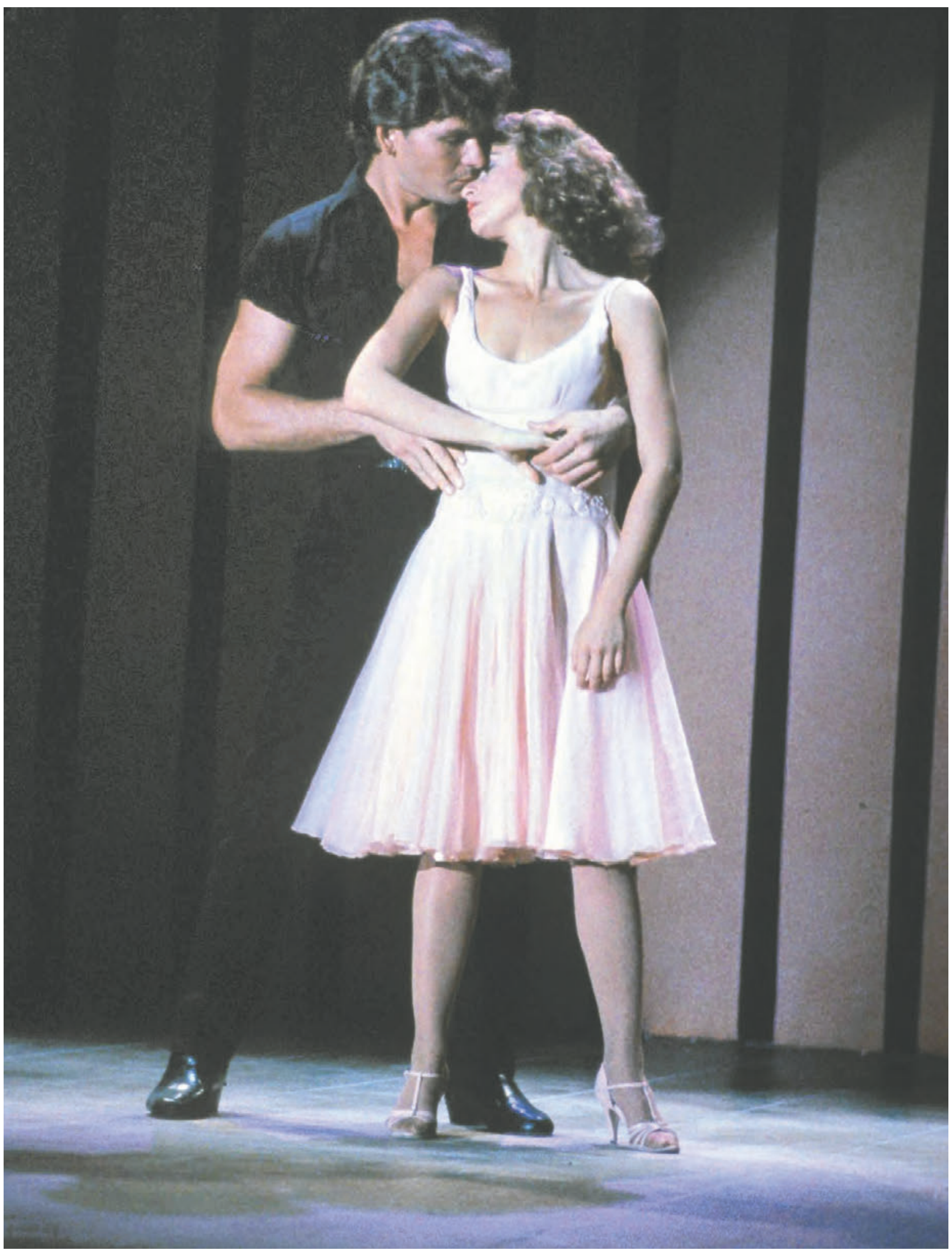
Congratulations

on your Diamond Jubilee (60 years) of religious life
Sister Yvonne Parent
(The Fun Nun)

From your four sisters Therese, Jeannette, Rita and Lucille

Let us in on your BIG NEWS...
• Birth • Engagement • Wedding •Graduation • Retirement

BOOK REVIEW



The movie Dirty Dancing put young actress Jennifer Grey in the Hollywood spotlight and jump started co-star Patrick Swayze's career. *LIONSGATE HOME ENTERTAINMENT*

OH, BABY

Jennifer Grey's stinging memoir an indictment of how beauty is judged

Out of the Corner
By Jennifer Grey
Ballantine. 352 pp $30

SARAH L. KAUFMAN

As the daughter of Broadway star Joel Grey, Jennifer Grey caught the acting bug early, at age six. That's when her father originated the role of the slick, menacing Master of Ceremonies in Cabaret onstage, in 1966. As Jennifer Grey writes in her keenly observed memoir, Out of the Corner, her Saturday treat was to sit in his dressing room while he transformed himself with false eyelashes, lip pencil and Dippity-do gel.

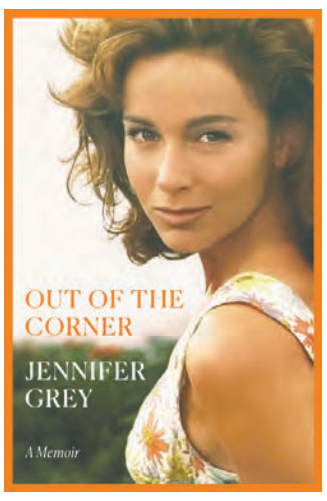
"Every one of his features was reinvented from scratch," she writes. "This self-drawn mask blotted out any trace of my dad as I knew him."

Those admiring words haunt the rest of her story, because Grey's own arc of celebrity has been famously complicated by the reinvention, so to speak, of her own features.

Grey rose to fame in her mid-20s with a pair of films that became touchstones of the 1980s. She was the perfectly snotty sister in Ferris Bueller's Day Off, in 1986, and a year later she was adorable, endearing, sexy Baby, mambo queen of the Catskills, in Dirty Dancing. That surprise hit, pairing her with heartthrob Patrick Swayze, transformed her.

"I was America's sweetheart, which you would think would be the key to unlocking all my hopes and dreams," she writes. "But it didn't go down that way."

Grey chronicles the flatlining



of her career with savage and engaging wit. But the pain is clear, and it is tied up with how much of her Hollywood value hinged on her features, and the price she paid for tweaking her face.

"For one thing," she writes, "there didn't seem to be a surplus of parts for actresses who looked like me." That is, Jewish. Or rather, a bit too Jewish. So she did what so many Jews have done for ages — what both her parents had done, in fact: Grey got a nose job. She was almost 30, a celebrity, yet out of work. She told her doctor not to radically alter her looks, and he didn't. Success! Grey started getting hired again. When a medical problem arose about a year later, another surgery was necessary — and the doctor wasn't so careful this time. Now her life truly tanked, because she'd become unrecognizable.

Even Grey's father told her (with what feels like brutal coolness), "I think it would probably be best if you just didn't go out in public for a while."

Out of the Corner is meant to be a tale of triumph, and it is, once Grey climbs out of career-crash hell. Swayze's character, Johnny, famously proclaimed in Dirty Dancing that "nobody puts Baby in a corner," but that's where Grey ended up in real life. Alone. Rejected, as she tells us, by an ultra-conformist industry, and not helped by her own tendency toward self-destruction. She takes us on a wild ride through her star-studded youth (belting show tunes with Stephen Sondheim), her star-studded coke binges, and her many bad romances, featuring Johnny Depp, Matthew Broderick and a creepy zillionaire who flew the teenage Grey to Rio, where she tumbled into a bizarre situation involving her comic idol Gilda Radner.

Nothing, however, comes close to the torment of what she dubs "Schnozzageddon." The irony of it: "I'd taken a certain pride in being an original, not looking like every other actress." So had her fans. Was her "physical imperfection" key to the public's connection to her? Perhaps. She avoids Googling herself, but still, she says, the outrage over her appearance has gone too far.

"Is there no statute of limitations on how long people think they are entitled to ownership of my face? ... Overnight, I was basically reduced to a punchline."

Grey had only ever wanted to be an actor. But barely out of her 20s, she had no work, no backup plan. What followed was a prolonged period of self-reflection. She got sober, and found an acting coach and a husband. (The marriage lasted 20 stable years.) She discovered happiness and meaning in later adulthood, not as an actor, but as a mother — and a dancer. At 41, she gave birth to a daughter, and at 50 she won season 11 of Dancing With the Stars, despite rupturing her lumbar disc near the end. America's sweetheart, all over again. She hadn't danced seriously in 20 years, she writes. But she did what dancers do: She worked her tail off. She polished her innate talent. She dug deep into a passion for physical expression and music.

She also barrelled through bullet-biting pain. That injury seems like a metaphor for a hard-won life.

Grey's memoir is interesting not only for her journey out of darkness but also for what her story reveals about what women encounter in the entertainment business, and the fortitude required to make it. The double standards. So much riding on appearance. Those sex scenes Grey had to shoot without warning, without a closed set.

The agent who set her up with a pre-famous Depp, over Grey's objections, in the hope of nabbing him as a client. Grey doesn't come right out and connect the dots like this, but you can't come away from her book without being aghast at how Hollywood operates.

But the message of hope in this book is that the bad stuff was outweighed by the good things Grey, 62, is relishing now, including working on a sequel to Dirty Dancing.

The nose was nothing. Her true transformation came from within.

The Washington Post

PUBLIC INFORMATION CENTRE No. 2
COMMENT FORM

ST. ROSE STORMWATER PUMPING STATION

To address widespread flooding issues during extreme storm events, the City completed a comprehensive study known as the Sewer & Coastal Flood Protection Master Plan (SMP). The SMP identified the need for a new stormwater pumping station and new storm sewer outlet to the Detroit River to service the St. Rose drainage area. The City is undertaking the Municipal Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will determine the location and overall design concept of the proposed pumping station for the St. Rose drainage area.

THANK YOU

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 project website below:

https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

Please return your completed comment form on or before **July 13, 2022**, to:

Chrissy Jung, M.A.Sc., E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 519-567-9537
chrissy.jung@stantec.com

Attention: Chrissy Jung
Stantec Consulting Ltd.
2555 Ouellette Avenue, Unit 100
Windsor ON
N8X 1L9

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE NO. 2 – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

NAME ______________________________

EMAIL ADDRESS ______________________________

TELEPHONE NO. ( ) ______________________________

DATE ______________________________ SIGNATURE ______________________________

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.

City of Windsor

St. Rose Stormwater Pumping Station

PUBLIC INFORMATION CENTER

WELCOME

Municipal Class Environmental Assessment (Class EA)

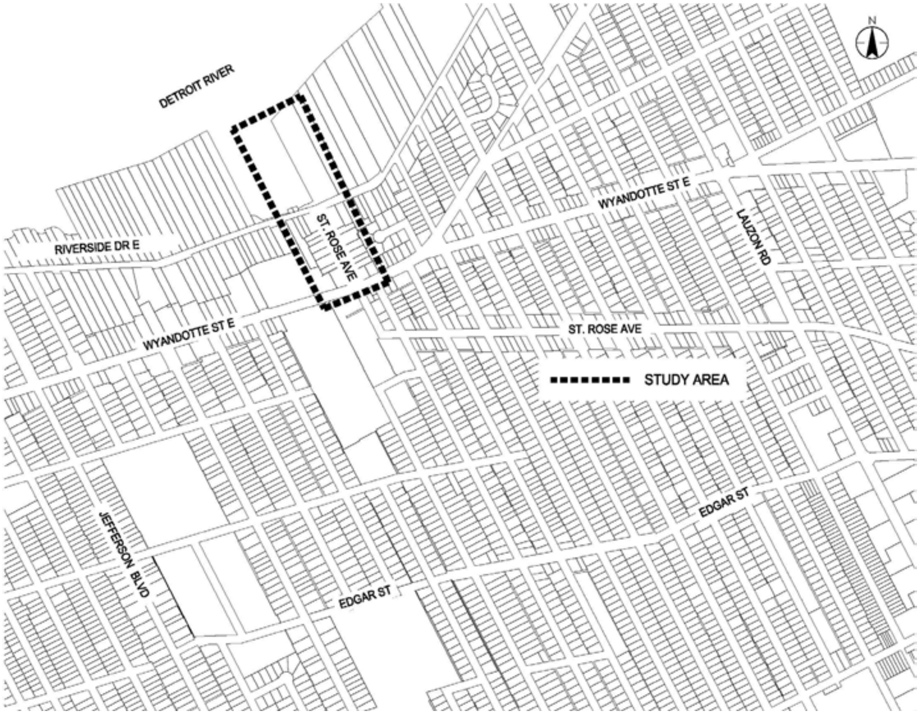
June 2022

Study Overview

The purpose of this study is to determine the preferred location and design for the St. Rose stormwater pumping station and storm sewer outlet.

The purpose of this Public Information Center (PIC) is to:

- Present an evaluation of alternative design concepts for the St. Rose stormwater pumping station
- Obtain public feedback on the preferred design concepts for the proposed St. Rose Stormwater Pumping Station



Problem Statement

WINDSOR STAR

Rainfall 'deluge' triggers flooding, road closures

With widespread reports of flooding and roads being under water, the city on Friday was urging residents to stay off...

July 16, 2021 **Local News**

WINDSOR STAR

Windsor flooding makes list of Top 10 weather events in 2017

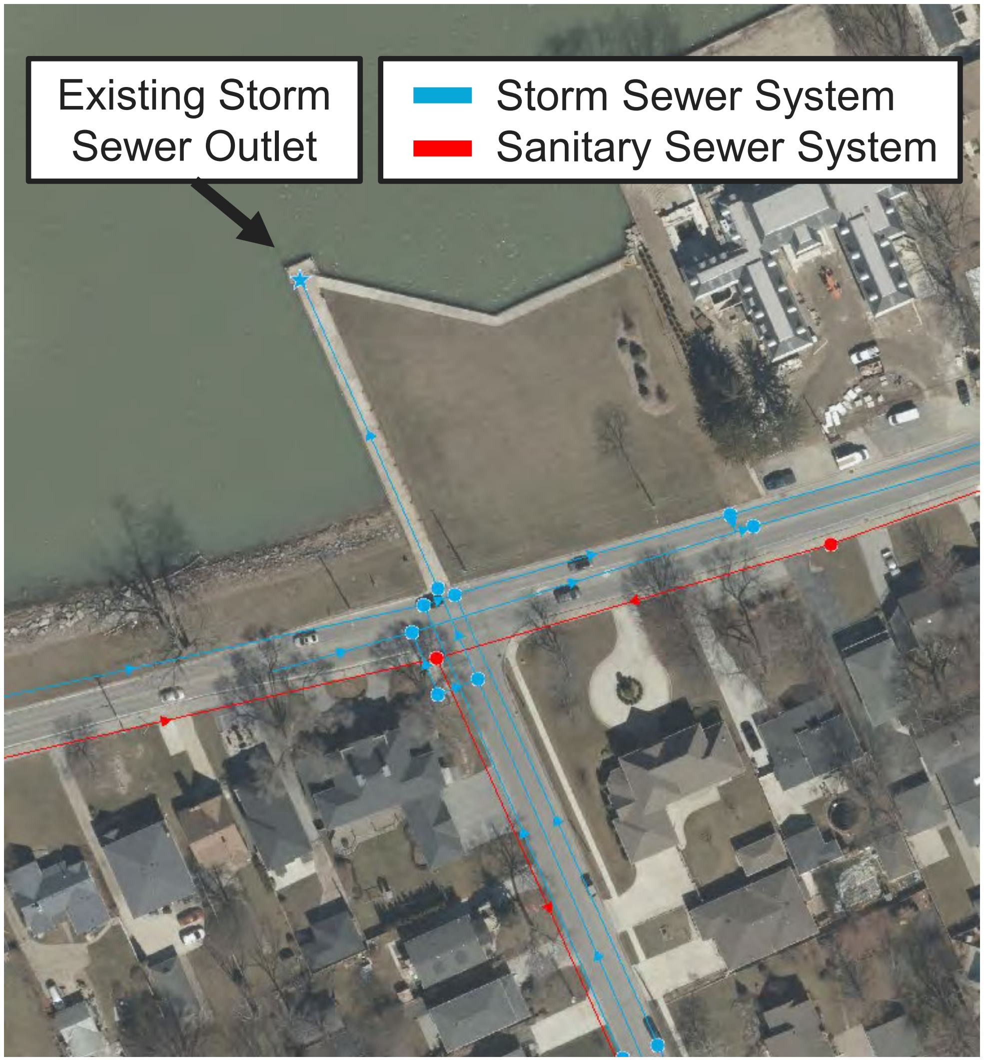
Windsor has made Environment Canada's national list of Top 10 weather events in 2017 for the massive storm in lat...

December 21, 2017 **Local News**

- The Sewer & Coastal Flood Protection Master Plan (SMP) identified the St. Rose drainage area as a problem area due to the:
  - High potential for basement flooding (significant risk to homes in the event of a 1 in 5-year storm event)
  - History of surface level flooding during storm events
  - Risk of coastal flooding due to proximity to the Detroit River
- The existing gravity outlet sewer is unable to handle wet weather flows during severe storm events.
- Failure to have adequate infrastructure in place will negatively impact the community and may cause damage to infrastructure, properties, and local transportation networks.

Background

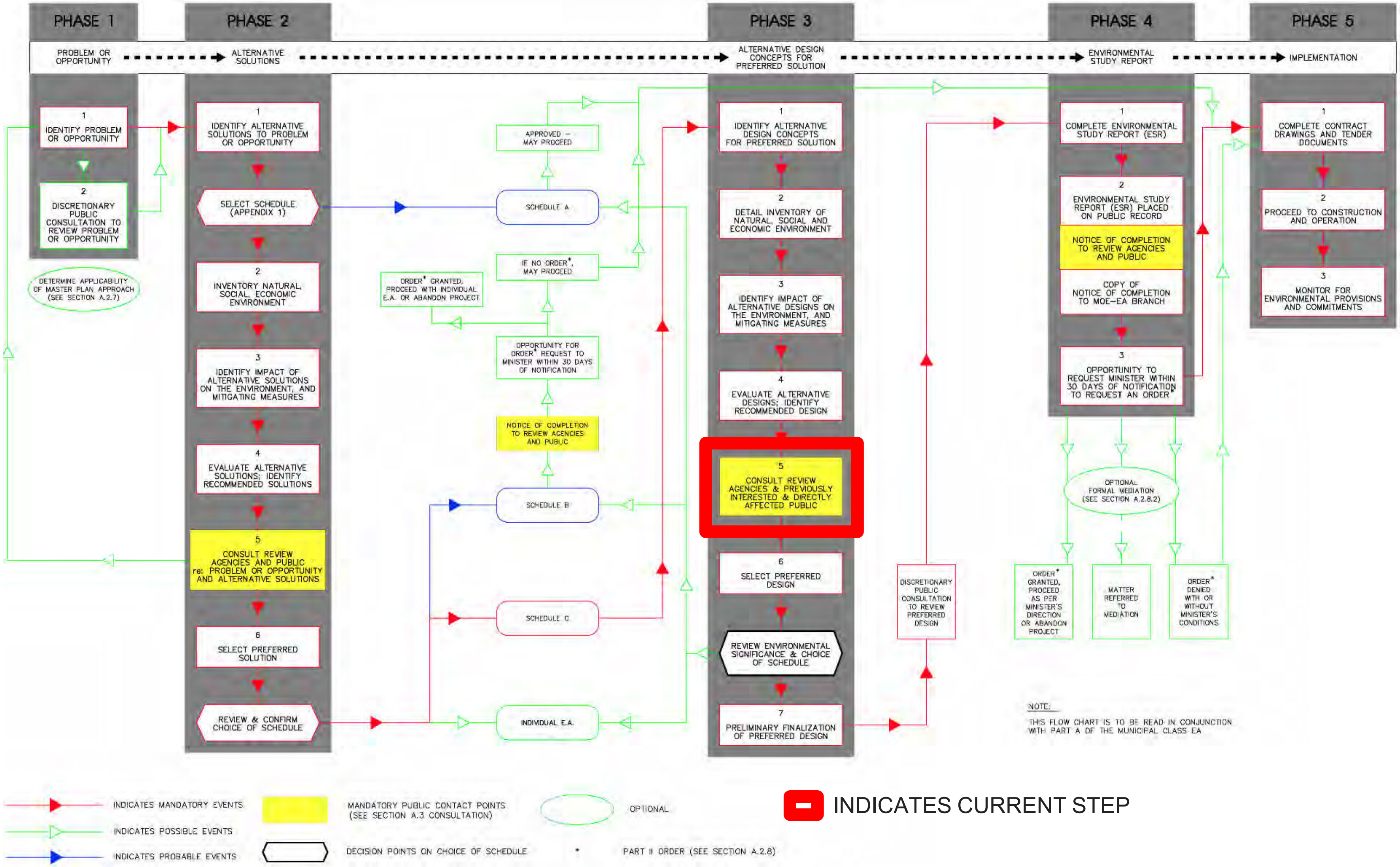
Existing Storm Sewer Outlet in St. Rose Beach Park



- The existing stormwater sewer outlet is located beneath the paved walkway in St. Rose Beach Park
- The outlet provides service for the stormwater collected from foundation drains, roof drains, and catch basins
- The proposed pumping station will service the St. Rose drainage area to prevent flooding during severe storm events

Background

Overview of the Municipal Class EA Process



Background

Key Features of the Class EA Process

The project is being conducted in accordance with the Municipal Class EA requirements for ‘Schedule C Projects’:

Municipal Class EA Phases	
Phase 1 – Review and identify problem or opportunity	SMP
Phase 2 – Alternative solutions to problem	SMP
Phase 3 – Alternative design concepts for the preferred solution	This EA Study
Phase 4 – Environmental Study Report	This EA Study
Phase 5 – Implementation of the preferred design	2023-2026

Background
Phase 1 and 2

Phase 1 and 2 of the Class EA process were completed as part of the SMP.

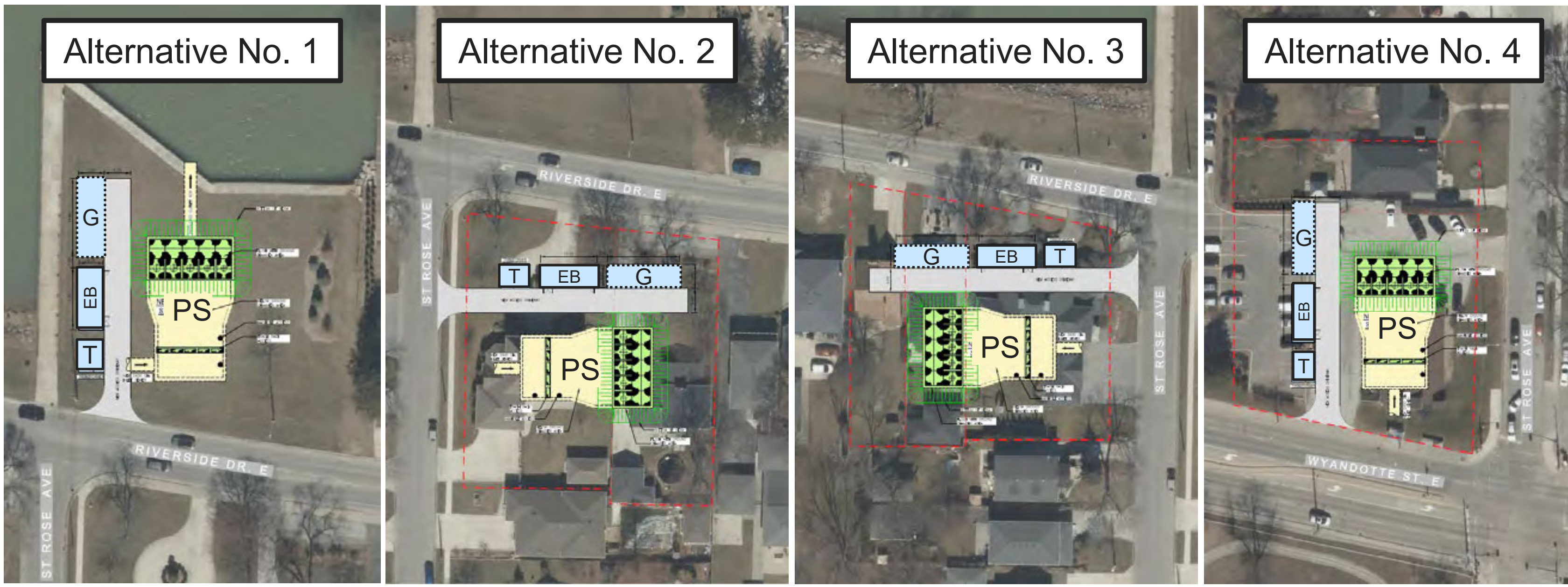
The need to improve current flooding conditions in the St. Rose drainage area was identified. After consultation with review agencies and the public, the preferred solution was determined to be:

- ***A new stormwater pumping station near the location of the existing St. Rose gravity outlet***

- ***Designed with a capacity of 13.5 m^3/s to provide service for a 1 in 100-year storm event***

Background
Phase 3

Phase 3 of the Class EA process for this study included a review of alternative locations for the St. Rose stormwater pumping station:



On Grade Below Grade Above Grade Green Driveway	PC = Pumping Chambers EB = Electrical Building G = Generator w/ Noise Enclosure T = Transformer	Note: Preliminary layouts presented on this slide are for display purpose and may be subject to change in the final design phase.

Background
Phase 3

A detailed evaluation identified St. Rose Beach Park as the preferred location for the proposed stormwater pumping station.

Benefits of the St. Rose Beach Park Location

- No displacement of existing residents or businesses
- Able to meet flood mitigation objectives while mitigating undesirable social, economic, and environment impacts
- Flexible to adjust to climate change (room for potential expansion)
- Relatively straight forward construction, operation, and maintenance requirements
- Shortest construction duration
- Least disruption to residents/community during construction
- Lowest relative capital and operation cost

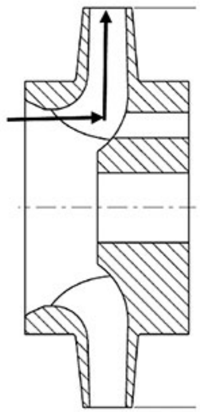
Background

Phase 3 and 4 of the Class EA

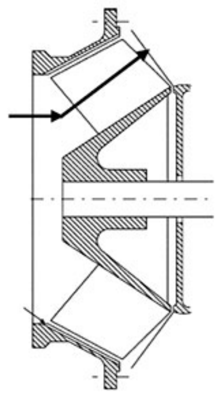
Phase	Project Component	Date
3	Review the four alternative locations for the St. Rose pumping station and identify the preferred location; St. Rose Beach Park identified as the recommended location	April 2022
3	Evaluate alternative design concepts (pump technology, site layout, and architectural features) and identify the recommended design for the St. Rose stormwater pumping station	May 2022
3	Host PIC to obtain comments and public input on the recommended design concepts	Ongoing
4	Prepare the Environmental Study Report (ESR) and post for 30-day public and agency review	Fall 2022

Design Alternatives
Pumping Technology

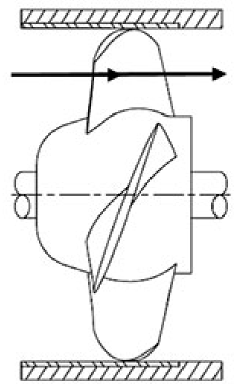
The four most common pump types for flood control applications:



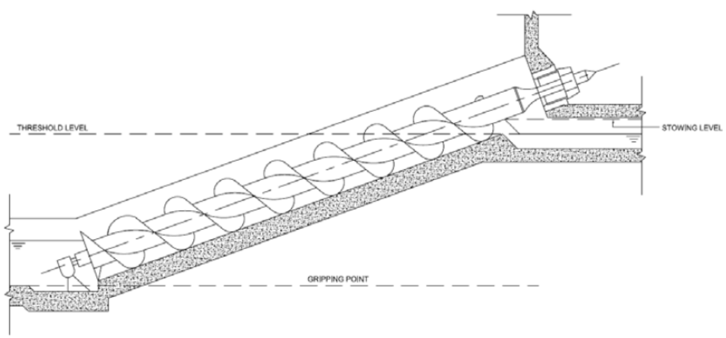
Centrifugal Flow



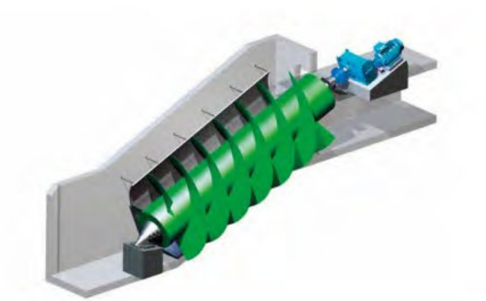
Mixed Flow



Axial Flow



Screw



Design Alternatives
Pumping Technology

Centrifugal Flow Pumps	• Centrifugal flow pumps are used to meet a wide range of head and flow requirements.
Axial Flow Pumps	• Axial-flow pumps are high-capacity pumps that are typically used for low head, high flow applications such as stormwater pumping stations.
Mixed Flow Pumps	• The mixed- flow type has impellers with vanes which are shaped such that the pump functions as a compromise between axial flow pumps and centrifugal pumps. Mixed-flow pumps are able to operate at higher head values than axial-flow pumps while delivering higher flow rates than centrifugal-flow pumps.
Screw Pumps	• Screw pumps are positive displacement pumps based on the Archimedes principle of a rotating shaft. Screw pumps can provide constant flow rates and pressures and have a relatively high tolerance for solids entering the flow stream. • Commonly used when low heads are required (less than ten meters).

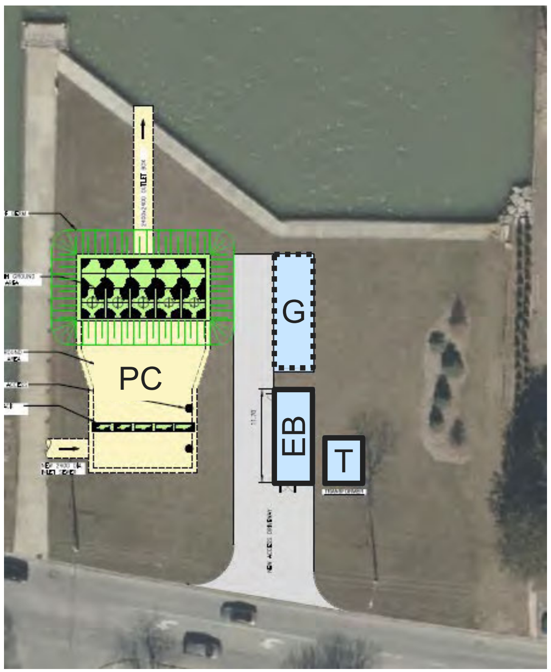
Design Alternatives
Pumping Technology

Pump Type Criteria	Centrifugal- Flow Pump	Axial-Flow Pump	Mixed-Flow Pump	Screw Pump
Performance & Effectiveness	Lower efficiency, shorter lifetimes	Very efficient in high flow, low head applications	Efficient in high flow, low head applications.	Wide range of flow, Difficult to increase head.
Space Required	Low space requirements	Low space requirements	Low space requirements	Relatively high space requirements.
Capital/ Construction Cost	Relatively low to medium	Relatively low to medium	Relatively low to medium	Relatively low to medium
O&M Requirements	Low to medium O&M requirements	Low O&M requirements	Low to medium O&M requirements	Medium O&M requirements
General Concerns	Loss of efficiency should solids enter the flow.	Performance is very dependent upon providing good inlet flow, Loss of efficiency should solids enter the flow	Performance is very dependent upon providing good inlet flow, Loss of efficiency should solids enter the flow	Difficult to modify, Requires enclosing.

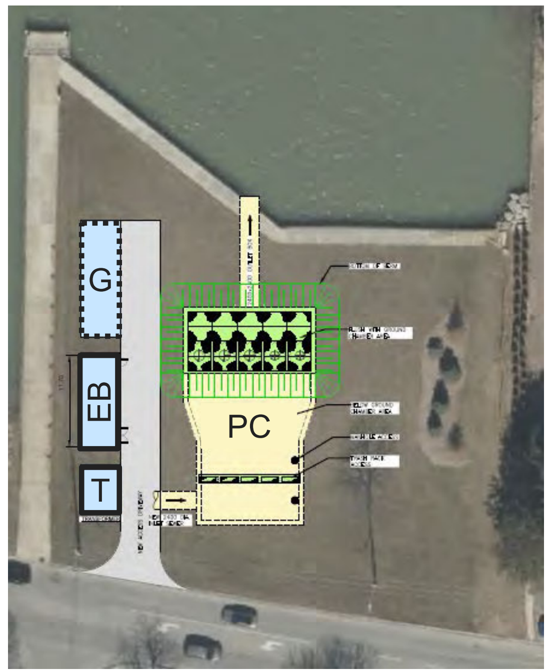
Axial – Flow Pump is recommended based on the high efficiency, low space requirements, and ability to reduce sightline obstructions.

Design Alternatives
Site Layout

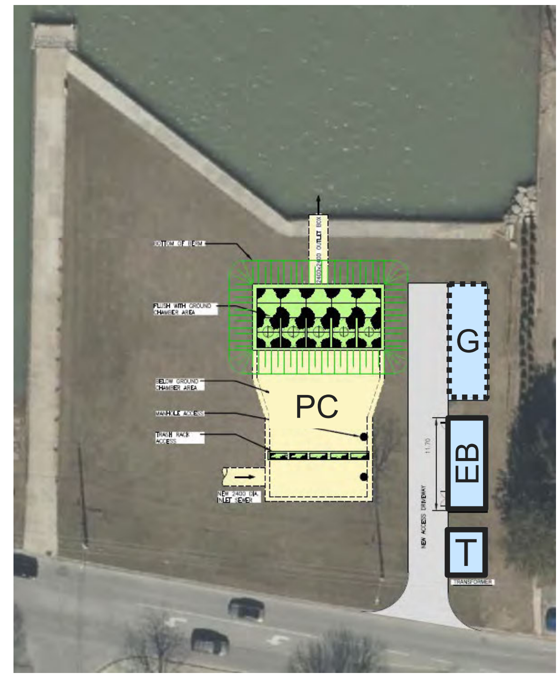
Option No. 1



Option No. 2



Option No. 3



On Grade Below Grade Above Grade Green Driveway	PC = Pumping Chambers EB = Electrical Building G = Generator with Noise Enclosure T = Transformer	Note: Preliminary layouts presented on this slide are for display purpose and may be subject to change during the implementation phase (detailed design).

Design Alternatives

Site Layout

	Option No. 1	Option No. 2	Option No. 3
Impact to Waterfront View	• Above grade infrastructure in the centre of the site • **Greatest** impact	• Above grade infrastructure aligned with western promenade • **Reduced** impact	• Above grade infrastructure blends into eastern tree line • **Least** impact
Impact to Park Greenspace	• Greenspace is divided into two sections • **Greatest** impact	• Large undisturbed greenspace • **Least** impact	• Large undisturbed greenspace • **Least** impact
Noise and Vibration	Designed in accordance with the Ontario Ministry of Environment, Conservation and Parks (MECP) Environmental Noise Guidelines, which will ensure the appropriate engineering control measures are in place.		
Generator Emissions	Designed in accordance with MECP emission requirements, which will ensure the appropriate engineering control measures are in place.		

Layout Option No. 3 is recommended based on the provision of undisturbed greenspace and ability to reduce sightline obstructions.

Design Alternatives
Architectural Design of Building

Option No. 1

Design Features:

- Simple and modern architecture style
- Limestone façade
- Wood accents
- Windows
- Green roof

Note: Preliminary architectural designs presented on this slide are for display purpose and may be subject to change in the final design phase.

Design Alternatives
Architectural Design of Building

Option No. 2

Design Features:

- Traditional residential architecture style
- Limestone and redbrick façade
- Wood accents
- Windows with black trim
- Gable roof with dormers
- Similar design to the Howard and Walker Road Railway Underpass Pumping Stations (2000's)

Note: Preliminary architectural designs presented on this slide are for display purpose and may be subject to change in the final design phase.

Design Alternatives
Architectural Design of Building

Option No. 3

Design Features:

- Modern residential architecture style
- Limestone façade
- Windows with black trim
- Mansard roof with dormers
- Similar design to residential buildings in the St. Rose drainage area

Note: Preliminary architectural designs presented on this slide are for display purpose and may be subject to change in the final design phase.

Design Alternatives

Architectural Design of Building

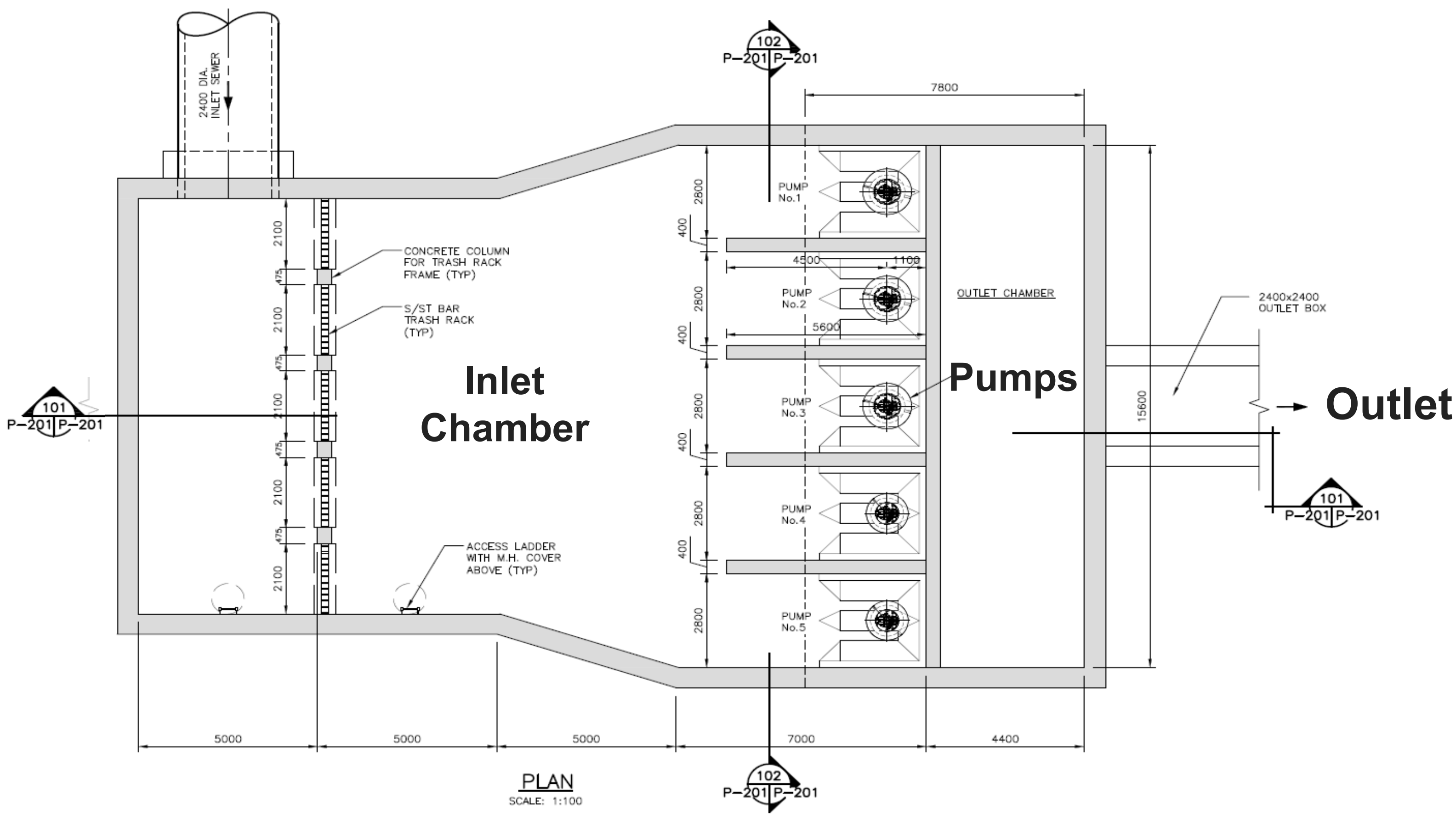
	Option No. 1	Option No. 2	Option No. 3
Design Style	Simple / modern style with limestone façade and green roof.	Traditional red brick residential style with faux windows.	Modern residential style with limestone façade and faux windows.
Materials	High quality building materials.	High quality building materials.	High quality building materials.
Built and Cultural Heritage	Fit to local built and cultural heritage.	Fit to local built and cultural heritage. Similar to recent pumping stations built throughout the City.	Best fit to local built and cultural heritage. Similar to residential buildings in the St. Rose drainage area.

Option No. 3 the modern residential building style is recommended based on built and cultural heritage of the neighbourhood.

Summary of Recommended Design

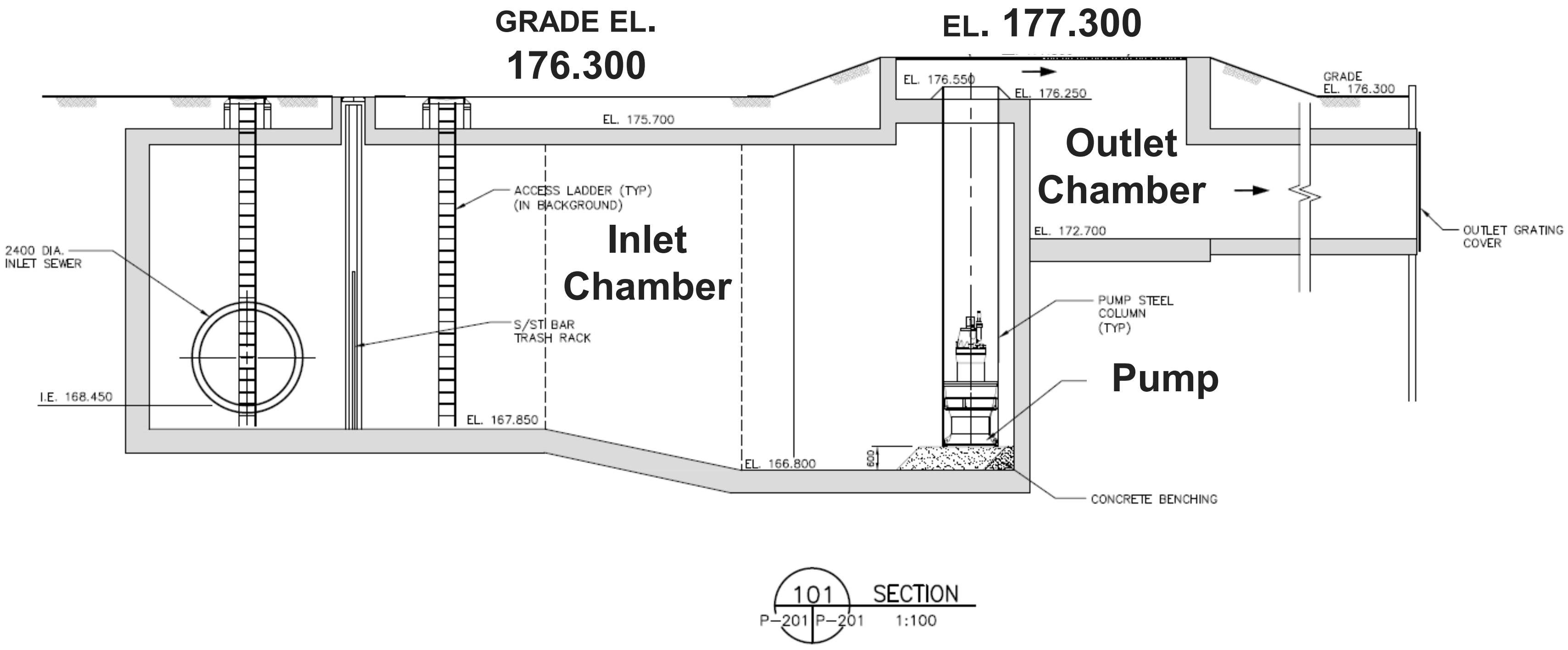
Preliminary Plan View

This figure shows the top view and dimensions of the proposed pumping station:



Summary of Recommended Design
Preliminary Sectional View

This figure shows the side view and dimensions of the proposed pumping station:



Summary of Recommended Design

Preliminary Rendering

Preliminary renderings presented on this slide are for display purpose and may be subject to change in the implementation phase (detailed design). *The generator will be equipped in a noise and weatherproof enclosure. The appearance of this enclosure will be determined in the detailed design phase based on availability from manufacturers.*

Summary of Recommended Design
Preliminary Rendering

Preliminary renderings presented on this slide are for display purpose and may be subject to change in the implementation phase (detailed design). *The generator will be equipped in a noise and weatherproof enclosure. The appearance of this enclosure will be determined in the detailed design phase based on availability from manufacturers.*

Summary of Recommended Design
Preliminary Rendering

Preliminary renderings presented on this slide are for display purpose and may be subject to change in the implementation phase (detailed design). *The generator will be equipped in a noise and weatherproof enclosure. The appearance of this enclosure will be determined in the detailed design phase based on availability from manufacturers.*

Summary of Recommended Design
Opinion of Probable Cost

Item	
Pumping Station and Outlet Structure	$14,700,000
Contingency Allowance	$2,900,000
Engineering Allowance	$4,400,000
Total Capital Cost:	**$22,000,000**

Note: The opinion of probable cost presented on this slide is an approximation and may be subject to change in the implementation phase (detailed design).

Next Steps

Project Component	Date
Environmental Study Report to City Council	Fall 2022
Notice of Completion	Fall 2022
Implementation, Phase 5 (Detailed Design and Construction)	2023 - 2026

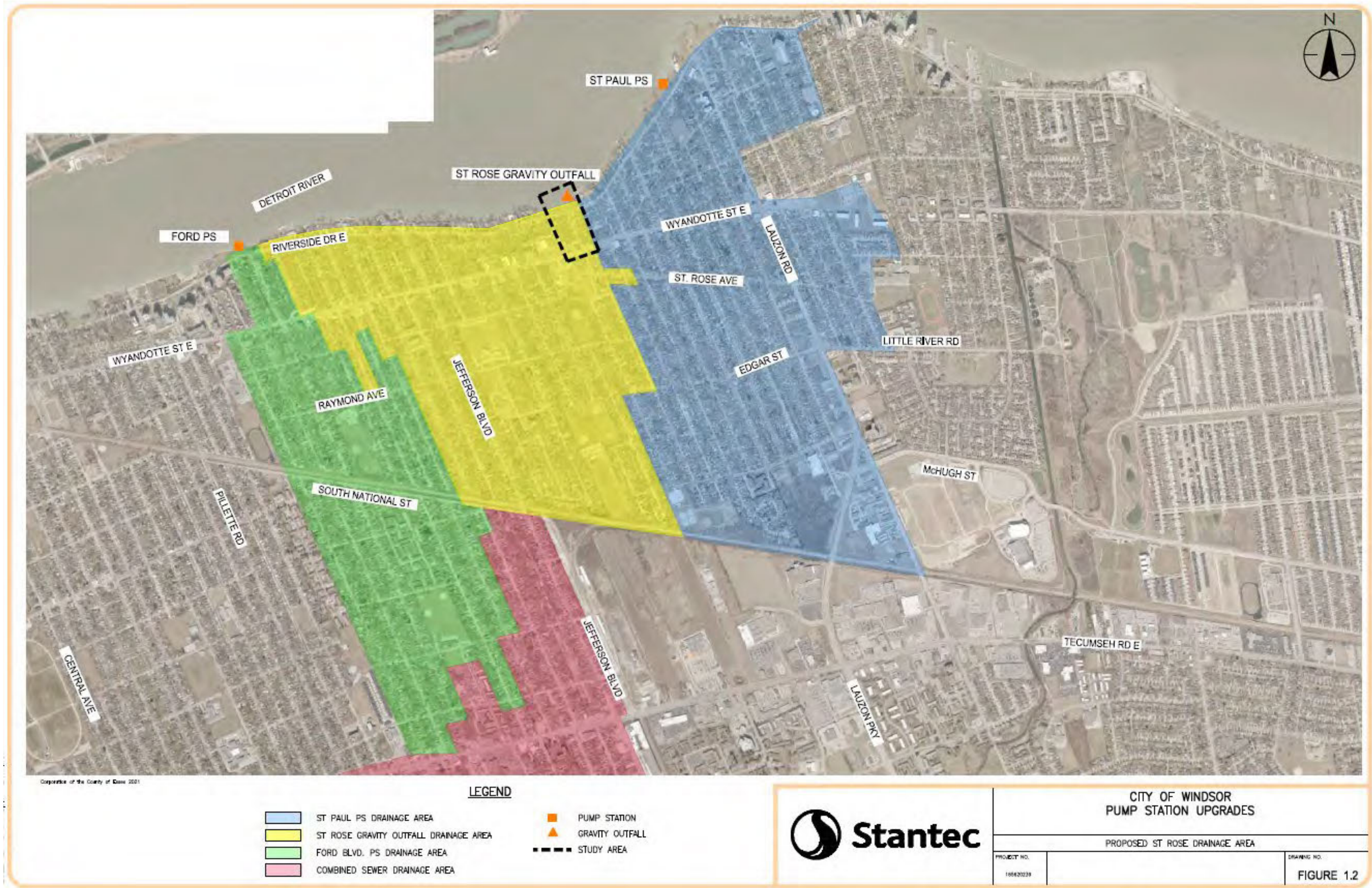
Thank You

Please visit the City of Windsor's project website to submit a feedback form.

[St. Rose Stormwater Pumping Station Environmental Assessment (citywindsor.ca)]

Reference

St. Rose Drainage Area



APPENDIX C

Email Packages to Review Agencies

1. Email Package – Notice of Commencement
2. Contact List – Notice of Commencement
3. Email Package – Notice of PIC No. 1
4. Email Package – Notice of PIC No. 2
5. Email Package - Notice of Draft ESR
6. Contact List – Notice of PICs and Draft ESR

From: Jung, Chrissy
To: [redacted]
Subject: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario
Date: Friday, January 28, 2022 5:10:00 PM
Attachments: Notice of Study Commencement - St. Rose Pumping Station.pdf

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To Whom it May Concern,

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will involve evaluation of site selection and alternative design concepts for the proposed St. Rose Storm Water Pumping Station. A copy of the Notice of Study Commencement for the project is attached.

On behalf of the City of Windsor, 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.

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,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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Title	Surname	First Name	Organization	Department	Job Title	Address	City/Prov	Postal Code	Tel.	E-Mail	Notice of Commencement
Local Municipalities											
Mr.	Botham	Allan	County of Essex		Director of Infrastructure and Planning	360 Fairview Avenue West	Essex, Ontario	N8M 1Y6	519-776-6441 ex 1397	abotham@countyofessex.ca	1/28/2022
Mr.	Marra	Peter	Town of LaSalle		Deputy Chief Administrative Officer	5950 Malden Road	LaSalle, Ontario	N9H 1S4	519-969-7770	pmarra@lasalle.ca	1/28/2022
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	1/28/2022
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	1/31/2022
Mr.	Bartnik	Phil	Town of Tecumseh		Director Public Works & Engineering Services	917 Lesperance Road	Tecumseh, ON	N8N 1W9	519-735-2184	pbartnik@tecumseh.ca	1/28/2022
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	1/28/2022
Mr.	Sharon	Robert	Municipality of Leamington		Director of Infrastructure Services					rsharon@leamington.ca	1/28/2022
Mr.	Plancke	Andrew	Town of Kingsville		Director of Infrastructure and Engineering	2021 Division Rd North	Kingsville, ON	N9Y2Y9		aplancke@kingsville.ca	1/28/2022
Conservation Authority											
Mr.	Byrne	Tim	Essex Region Conservation Authority		CAO/Secretary-Treasurer	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6	519-776-5209 x 350	tbyrne@erca.org	1/28/2022
Mr.	Bryant	James	Essex Region Conservation Authority		Director, Watershed Management Services	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6	519-776-5209 x 246	jbryant@erca.org	1/28/2022
Mr.	Money	Kevin	Essex Region Conservation Authority		Director, Conservation Services	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6	519-776-5209 x 351	kmoney@erca.org	1/28/2022
Emergency Services											
	Krauter	Bruce	Essex-Windsor EMS	c/o Administrative Assistant, Office of the Chief	Chief	360 Fairview Ave West	Essex, ON	N8M 1Y6	519-776-6441 x 2654	bkrauter@countyofessex.on.ca	1/28/2022
Mr.	Horrobin	Barry	Windsor Police Service	Police Headquarters	Director of Planning & Physical Resources	150 Goyeau Street, PO Box 60	Windsor, ON	N9A 6J5	519-255-6700 x4471	bhorrobin@police.windsor.on.ca	1/28/2022
Fire Chief	Laforet	Stephen	Windsor Fire and Rescue		Fire Chief	815 Goyeau Street	Windsor, ON	N9A 1H7	519-253-6573	slaforet@citywindsor.ca	1/31/2022
Mr.	Benoit	Josh	Central Ambulance Communications Centre			4510 Rhodes Drive, Suite 320	Windsor, ON	N8W 5K5	519-256-2373	josh.benoit@ontario.ca	1/31/2022
Interest Groups											
			Olde Riverside Business Improvement Association		Operations Manager					bscheuerman@cogeco.ca	1/28/2022
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	1/28/2022
			Citizen Environmental Alliance							ceaadmin@cogeco.net	1/28/2022
	Frank	Butler	Citizen Environmental Alliance of Southwestern Ontario							flbutler12@gmail.com	1/28/2022
	Trish	Morris	International Joint Commission							commission@windsor.ijc.org	1/28/2022
	Trevor	Pitcher	Great Lakes Institute for Environmental Research							glierdir@uwindsor.ca	1/28/2022
	Averil	Parent	Windsor Essex County Environment Committee							aparent@citywindsor.ca	1/28/2022
	Claire	Sanders	Detroit River Canadian Cleanup							sanders@detroitriver.ca	1/28/2022
	Dave	Munro	Detroit River Clean-up							dmunro@mnsi.net	1/28/2022

Title	Surname	First Name	Organization	Department	Job Title	Address	City/Prov	Postal Code	Tel.	E-Mail	Notice of Commencement
Provincial Agencies											
	Kathleen	O'Neill	Ministry of the Environment, Conservation and Parks		Director of Environmental Assessment Branch	1st Flr, 135 St Clair Ave W, Toronto, ON M4V 1P5	Toronto, ON	M4V 1P5	647-287-5664	kathleen.oneill@ontario.ca	*1/28/2022*
	Keyvani	Mohsen	Ministry of the Environment, Conservation and Parks		Waste Approval Manager	2nd Flr, 135 St Clair Ave W, Toronto, ON M4V 1P5	Toronto, ON	M4V 1P5	416-432-7253	mohsen.keyvani@ontario.ca	*1/28/2022*
	Wilson	Marcelina	Ministry of the Environment, Conservation and Parks	Windsor Area Office	Supervisor	4510 Rhodes Drive, Unit 620	Windsor, ON	N8W 5K5	519-948-1464	marcelina.wilson@ontario.ca	*1/28/2022*
Ms.	Barboza	Karla	Ministry of Heritage, Sport, Tourism and Culture Industries		Team Lead - Heritage	5th Flr, 400 University Ave	Toronto, ON	M7A 2R9	416-660-1027	karla.barboza@ontario.ca	*1/28/2022*
	Romeo	Laura	Ministry of Heritage, Sport, Tourism and Culture Industries		Heritage Planner	5th Flr, 400 University Ave	Toronto, ON	M7A 2R9	647-248-9147	Laura.Romeo@ontario.ca	*1/28/2022*
	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	*1/28/2022*
	Holtby	Cara	Ministry of Northern Development, Mines, Natural Resources and Forestry (NRF)		Manager of Land Use Planning and Strategic Issues Section	4th Flr S, 300 Water St,	Peterborough, ON	K9J 3C7	705-749-8169	Cara.Holtby@ontario.ca	*1/28/2022*
	Wilson	Mitch	Ministry of Northern Development, Mines, Natural Resources and Forestry (NRF)	Aylmer District	District Manager	615 John Street North	Aylmer, ON	N5H 2S8	519-773-4710	mitch.wilson@ontario.ca	*1/28/2022*
	Creighton	Nancy	Ministry of Economic Development, Job Creation and Trade	Windsor Office	Senior Business Advisor	Roundhouse Centre Suite 214, 3155 Howard Ave	Windsor, Ontario	N8X 4Y8	519-259-5509	nancy.creighton@ontario.ca	*1/28/2022*
	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	*1/28/2022*
	Boyd	Eric	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	*1/28/2022*
	Eckert	Anneleis	Ministry of Environment and Climate Change							anneleis.eckert@ontario.ca	*1/28/2022*
	Perry	Elizabeth	Ontario Ministry of Transportation	Transportation Infrastructure Management Division Design and Engineering Branch Engineering Program Delivery West	Head, Environmental	659 Exeter Road	London, ON	N6E 1L3	519-619-4086	elizabeth.perry@ontario.ca	*1/28/2022*
	Swim	Michael	Ontario Ministry of Transportation	Transportation Infrastructure Management Division Asset Management Branch Capital Planning and Program Office Capital Planning & Program Development (West)	Head, Capital Planning & Program Development (W)	Exeter Road Complex, 659 Exeter Rd	London, ON	N6E 1L3	519-619-1153	michael.swim@ontario.ca	*1/28/2022*
Federal Agencies											
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@ceaa-acee.gc.ca	*1/28/2022*
	General		Environment and Climate Change Canada							ec.enviroinfo.ec@canada.ca	*1/28/2022*
Ms.	Eddy	Sara	Fisheries and Oceans Canada - Central and Arctic Region	Fisheries Protection Program	Senior Fisheries Protection Biologist	867 Lakeshore Road, PO Box 5050	Burlington, ON	L7R 4A6	(905) 336-4535	Sara.Eddy@dfo-mpo.gc.ca	*1/28/2022*
Ms.	Shea	Suzanne	Transport Canada Marine	Navigable Water Protection Officer		100 Front Street South, 1st Floor	Sarnia, ON	N7T 2M4	519-383-1863	NPPONT-PPNONT@tc.gc.ca	*1/28/2022*
Mr.	Barry	Peter	Windsor Port Authority		Director	3190 Sandwich Street	Windsor, ON	N9C 1A6	519-258-5741 xt.211	pberry@portwindsor.com	*1/31/2022*
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		darren.winger@ontario.ca	*1/28/2022*

Title	Surname	First Name	Organization	Department	Job Title	Address	City/Prov	Postal Code	Tel.	E-Mail	Notice of Commencement
Utilities											
	Manzon	Christopher	ENWIN Utilities	Windsor Utilities Commission	Director, Engineering (Water)	787 Ouellette Avenue, PO Box 1625 Stn A	Windsor, ON	N9A 5T7	519-566-3897	cmanzon@enwin.com	1/28/2022
	Ogg	Bruce	ENWIN Utilities	Water						bogg@enwin.com	1/28/2022
	General		ENWIN Utilities	HYDRO						tsd@enwin.com	1/28/2022
	Fuerth	Tyson	Bell Canada		Manager, Network Provisioning	1149 Goyeau Street, PO Box 1601	Windsor, ON	N9A 1H9	519-973-4711	tyson.fuerth@bell.ca	1/28/2022
	Markc	Rachel	Bell Canada							rachel.marks@bell.ca	1/28/2022
	Kovacs	Aaron	Bell Canada							aaron.kovacs@bell.ca	1/28/2022
	Team Email		TELUS							telusutilitymarkups@telecon.ca	1/28/2022
	Planning Support		ROGERS							planningsupport.team@rci.rogers.com	1/28/2022
	Jones	Mark	MNSI							mjones@mnsi.net	1/28/2022
	Hartleib	Dave	MNSI							hartleib@mnsi.net	1/28/2022
	Raymond	Frank	Cogeco Cable Services			2225 Dougall Avenue	Windsor, ON	N8X 5A7		raymond.frank@cogeco.com	1/28/2022
	Haggins	Daniel	Cogeco Cable Services							daniel.haggins@cogeco.com	1/28/2022
	Ceccacci	Will	Union Gas			50 Keil Drive North	Chatham, ON	N7M 5M1		wceccacci@uniongas.com	1/28/2022
	Nicholls	Jennifer	Union Gas							jennifer.nicholls@uniongas.com	1/28/2022
	Anthony	Clavet	Essex Power							aclavet@essexpowerlines.ca	1/28/2022
	MacAulay	Norman	E.L.K Energy		Operations Manager					nmacaulay@elkenergy.com	1/28/2022
			Ontario Power Generation							Executivevp.lawanddevelopment@opg.com	1/28/2022
			Essex Terminal Railway Company			1601 Lincoln Road	Windsor, ON	N8Y 2J3	519-973-8222	info@etr.ca	1/28/2022
	Zerdin	Joseph	Hydro One		Director of Customer Care					joseph.zerdin@hydroone.com	1/28/2022
	Maga	Jessica	Hydro One		Manager-Government Relations					jessica.maga@hydroone.com	1/28/2022
Ms.	Susan	Budden	Ontario Clean Water Agency	Southwest Regional Hub Office	Business Development Manager	450 Sunset Drive, Suite 370	St. Thomas ON	N5R 5V1	519-637-8334	sbudden@ocwa.com	1/28/2022

Title	Surname	First Name	Organization	Department	Job Title	Address	City/Prov	Postal Code	Tel.	E-Mail	Notice of Commencement
Aboriginal Agencies											
	Mann	Molly	Ministry of Indigenous Affairs Assistant Deputy Minister's Office - Indigenous Relations and Programs Division Indigenous Relations Branch	Manager, Indigenous Relations Unit		Suite 400, 160 Bloor Street East	Toronto, ON	M7A 2E6		molly.mann@ontario.ca	1/28/2022
	Levecque	Heather	Ministry of Indigenous Affairs Assistant Deputy Minister's Office - Indigenous Relations and Programs Division Indigenous Relations Branch	Director, Indigenous Relations		Suite 400, 160 Bloor Street East	Toronto, ON	M7A 2E6	416-325-7032	heather.levecque@ontario.ca	1/28/2022
Ms.	Whiteye	Jennifer	Southern First Nations Secretariat		Executive Director	22361 Austin Line	Bothwell, ON	N0L 1Y0	519-692-5868 x242	jenwhiteye@sfns.on.ca	1/28/2022
First Nation Communities/Métis Groups											
Dr.	Jacobs	Dean	Walpole Island First Nation / Bkejwanong Territory		Heritage Centre Director	117 Tahgahoning Road,R.R. #3	Wallaceburg, ON	N8A 4K9	519-627-1475	dean.jacobs@wifn.org	1/28/2022
	MacBeth	Janet	Walpole Island First Nation / Bkejwanong Territory		Project Review Coordinator	117 Tahgahoning Road,R.R. #3	Wallaceburg, ON	N8A 4K9	519-627-1481	janet.macbeth@wifn.org	1/28/2022
	Hillier	Louise	Caldwell First Nation		Band Rep.	14 Orange Street	Leamington, ON	N8H 1P5	519-326-1766	band.rep@caldwellfirstnation.ca	1/28/2022
			Caldwell First Nation		Environmental & Consultation Coordinator					ecc@caldwellfirstnation.ca	1/28/2022
	Plain	Chris	Aamjiwnaang First Nation		Chief	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5	519-336-8410	chief.plain@aamjiwnaang.ca	1/28/2022
Ms.	O'Brien	Cathleen	Aamjiwnaang First Nation		Environmental Coordinator	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5	519-336-8410	cobrien@aamjiwnaang.ca	1/28/2022
Ms.	Jackson	Courtney	Aamjiwnaang First Nation		Environment Worker	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5	519-336-8410	cjackson@aamjiwnaang.ca	1/28/2022
	Jacqueline	French	Chippewas of the Thames First Nation		Chief	320 Chippewa Road	Muncey, ON	N0L 1Y0	519-289-5555	jfrench@cottfn.com	1/28/2022
	Riley	Kelly	Chippewas of the Thames First Nation		Director of Treaties, Lands & Environment	320 Chippewa Road	Muncey, ON	N0L 1Y0	519-289-5555 x 209	kriley@cottfn.com	1/28/2022
	Burch	Fallon	Chippewas of the Thames First Nation		Consultation Coordinator	320 Chippewa Road	Muncey, ON	N0L 1Y0	519-289-5555 x 213	fburch@cottfn.com	1/28/2022
	Henry	Jason	Chippewas of Kettle & Stony Point First Nation		Chief	6247 Indian Lane, RR#2	Forest, ON	N0N 1J1	519-786-2125	Jason.Henry@kettlepoint.org	1/28/2022
	George	Valerie	Chippewas of Kettle & Stony Point First Nation		Consultation Coordinator	6247 Indian Lane, RR#2	Forest, ON	N0N 1J1	519-786-2125	valerie.george@kettlepoint.org	1/28/2022
	Chrisjohn	Adrian	Onelda Nation of the Thames ONYOTA'A:KA		Chief	2212 Elm Avenue	Southwold, ON	N0L 2G0	519-318-4598	adrian.chrisjohn@oneida.on.ca	1/28/2022
	Hill	Cherilyn	Onelda Nation of the Thames ONYOTA'A:KA		Political Office Manager	2212 Elm Avenue	Southwold, ON	N0L 2G0	(519) 318-4593	cherilyn.hill@oneida.on.ca	1/28/2022
	Froh	Margaret	Métis Nation of Ontario		Director, Lands, Resources and Consultations	75 Sherbourne Street, Suite 311	Toronto, ON	M5A 2P9	416-977-9881	margaretF@metisnation.org	1/28/2022
			MNO Windsor-Essex Métis Council							consultations@metisnation.org	1/28/2022
	Anderson	Kathleen	Métis Nation of Ontario, Thames Bluewater Métis Council		President	183 Summerset Crescent	London, ON	N6K 3S5		tbwmc.president@gmail.com	1/28/2022
Ms.	Stonefish	Denise	Moravian of the Thames (Delaware Nation)		Chief	14760 School House Line, RR 3	Thamesville, ON	N0P 2K0	519-692-3936	denise.stonefish@delawarenation.on.ca	1/28/2022

From: Jung, Chrissy
Bcc: [redacted]
Subject: 165620239: Notice of Public Information Centre - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario
Date: Tuesday, February 22, 2022 9:04:00 AM
Attachments: 1. Notice of Public Information Centre - Final.pdf

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To Whom it May Concern,

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will involve evaluation of site alternatives and alternative design concepts for the proposed St. Rose Storm Water Pumping Station.

The City is hosting a Public Information Centre (PIC) to present the evaluation of site alternatives and receive input from interested residents and stakeholders. The PIC will be held on Wednesday March 2, 2022 (3:00 to 7:00 pm) at the WFCU Centre, 8787 McHugh Street, Windsor, ON (Second Floor – Michigan Room). A copy of the Notice of Public Information Centre for the project is attached and additional information regarding the project is available on the City Webpage: St. Rose Storm Water Pumping Station Environmental Assessment (citywindsor.ca).

If you have any comments or concerns regarding this project, please contact the undersigned.
Sincerely,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From: Jung, Chrissy
Bcc: [redacted]
Subject: 165620239: Notice of Public Information Centre No. 2 - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario
Date: Friday, June 10, 2022 10:49:00 AM
Attachments: Notice of Public Information Centre No. 2.pdf

To Whom it May Concern,

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area.

The City is hosting a second Public Information Centre (PIC) to present alternative design concepts for the proposed St. Rose Pumping Station and receive input from interested residents and stakeholders. The PIC will be held on Thursday June 23rd, 2022 (3:00 to 7:00 pm) at the WFCU Centre, 8787 McHugh Street, Windsor, ON (Second Floor – Michigan Hall). You are receiving this email because you have been recognized as a representative for your local municipality, interest group, and/or agency.

A copy of the Notice of Public Information Centre for the project is attached and additional information regarding the project is available on the City Webpage: St. Rose Stormwater Pumping Station Environmental Assessment (citywindsor.ca)

If you have any comments or concerns regarding this project, please contact the undersigned.

Sincerely,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com
Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From: [redacted]
To:
Subject: 165620239: Notice of Draft Environmental Study Report - Class EA St. Rose Stormwater Pumping Station, City of Windsor, Ontario
Date: Thursday, February 23, 2023 3:56:00 PM

To Whom it May Concern,

The City of Windsor is undertaking a Schedule ‘C’ Municipal Class Environmental Assessment (Class EA) for the proposed St. Rose Pumping Station. The City of Windsor endorsed its first comprehensive Sewer and Coastal Flood Protection Master Plan (SMP) in 2020. The SMP was completed in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment process. It outlined that a new stormwater pumping station is required to discharge excess water during major storm events in the expanded St. Rose drainage area. This study will satisfy Phases 3 and 4 of the Class EA process which will involve the evaluation of the site location, site alternatives and design concept alternatives for the proposed St. Rose Stormwater Pumping Station. This “Draft” Environmental Study Report was prepared to document the activities and recommendations from the Class EA process.

Your agency is invited to submit comments on the “Draft” Environmental Study Report. In an effort to conserve paper and reduce printing costs, the report is being distributed in electronic format. Please use the following link and login information to access the report:
Login Information
FTP link: https://tmpsftp.stantec.com
Login name: s0302125843
Password: 3884153
Disk Quota: 20 GB
NEW Expiry Date: 3/9/2023
This file sharing service will expire on March 9th, 2023, if you require access after this date, please contact the undersigned.

Additional project details are available on the City Webpage: St. Rose Stormwater Pumping Station Environmental Assessment (citywindsor.ca).

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 March 16th, 2023.

Sincerely,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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Title	Surname	First Name	Organization	Department	Job Title	Address	City/Prov	Postal Code	Tel.	E-Mail
Local Municipalities										
Ms.	Habiba	Sumaiya	County of Essex		Environmental Coordinator	360 Fairview Avenue West	Essex, Ontario	N8M 1Y6	519-776-6441 ex 1397	Shabiba@countyofessex.ca
Mr.	Marra	Peter	Town of LaSalle		Deputy Chief Administrative Officer	5950 Malden Road	LaSalle, Ontario	N9H 1S4	519-969-7770	pmarra@lasalle.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
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
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.	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.	Sharon	Robert	Municipality of Leamington		Director of Infrastructure Services					rsharon@leamington.ca
Mr.	Plancke	Andrew	Town of Kingsville		Director of Infrastructure and Engineering	2021 Division Rd North	Kingsville, ON	N9Y2Y9		aplancke@kingsville.ca
Conservation Authority										
Mr.	Byrne	Tim	Essex Region Conservation Authority		CAO/Secretary-Treasurer	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6	519-776-5209 x 350	tbyrne@erca.org
	Planning Inbox		Essex Region Conservation Authority			360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6		planning@erca.org
	Martin	Tian	Essex Region Conservation Authority			360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6		tmartin@erca.org
Emergency Services										
	Krauter	Bruce	Essex-Windsor EMS	c/o Administrative Assistant, Office of the Chief	Chief	360 Fairview Ave West	Essex, ON	N8M 1Y6	519-776-6441 x 2654	bkrauter@countyofessex.on.ca
Mr.	Horrobin	Barry	Windsor Police Service	Police Headquarters	Director of Planning & Physical Resources	150 Goyeau Street, PO Box 60	Windsor, ON	N9A 6J5	519-255-6700 x4471	bhorrobin@police.windsor.on.ca
Fire Chief	Laforet	Stephen	Windsor Fire and Rescue		Fire Chief	815 Goyeau Street	Windsor, ON	N9A 1H7	519-253-6573	slaforet@citywindsor.ca
Mr.	Benoit	Josh	Central Ambulance Communications Centre			4510 Rhodes Drive, Suite 320	Windsor, ON	N8W 5K5	519-256-2373	josh.benoit@ontario.ca
Interest Groups										
			Olde Riverside Business Improvement Association		Operations Manager					bscheuerman@cogeco.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
			Citizen Environmental Alliance							ceaadmin@cogeco.net
	Frank	Butler	Citizen Environmental Alliance of Southwestern Ontario							flbutler12@gmail.com
	Trish	Morris	International Joint Commission							commission@windsor.ijc.org
	Trevor	Pitcher	Great Lakes Institute for Environmental Research							glierdir@uwindsor.ca
			Windsor Essex County Environment Committee							emp@citywindsor.ca
	Claire	Sanders	Detroit River Canadian Cleanup							sanders@detroitriver.ca
	Dave	Munro	Detroit River Clean-up							dmunro@mnsi.net

Title	Surname	First Name	Organization	Department	Job Title	Address	City/Prov	Postal Code	Tel.	E-Mail	Note
Provincial Agencies											
	Regional Email Address		Ministry of the Environment, Conservation and Parks		Director of Environmental Assessment Branch	1st Flr, 135 St Clair Ave W, Toronto, ON M4V 1P5	Toronto, ON	M4V 1P5	647-287-5664	eanotification.swregion@ontario.ca	
Ms.	Barboza	Karla	Ministry of Heritage, Sport, Tourism and Culture Industries		Team Lead - Heritage	5th Flr, 400 University Ave	Toronto, ON	M7A 2R9	416-660-1027	karla.barboza@ontario.ca	
	Romeo	Laura	Ministry of Heritage, Sport, Tourism and Culture Industries		Heritage Planner	5th Flr, 400 University Ave	Toronto, ON	M7A 2R9	647-248-9147	Laura.Romeo@ontario.ca	
	Brown	Sadie	Ministry of Northern Development, Mines, Natural Resources and Forestry (NRF)			615 John Street North	Aylmer, ON	N5H 2S8	519-773-4710	Sadie.Brown@ontario.ca	-asked to be removed
	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	Eric	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	
	Eckert	Anneleis	Ministry of Environment and Climate Change							anneleis.eckert@ontario.ca	
	Perry	Elizabeth	Ontario Ministry of Transportation	Transportation Infrastructure Management Division Design and Engineering Branch Engineering Program Delivery West	Head, Environmental	659 Exeter Road	London, ON	N6E 1L3	519-619-4086	elizabeth.perry@ontario.ca	
	Swim	Michael	Ontario Ministry of Transportation	Transportation Infrastructure Management Division Asset Management Branch Capital Planning and Program Office Capital Planning & Program Development (West)	Head, Capital Planning & Program Development (W)	Exeter Road Complex, 659 Exeter Rd	London, ON	N6E 1L3	519-619-1153	michael.swim@ontario.ca	
Federal Agencies											
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@ceaa-acee.gc.ca	
	General		Environment and Climate Change Canada							ec.enviroinfo.ec@canada.ca	
Ms.	Silver	Deborah	Fisheries and Oceans Canada	Fisheries Protection Program	Senior Fisheries Protection Biologist	867 Lakeshore Road, PO Box 5050	Burlington, ON	L7R 4A6	(905) 336-4535	FisheriesProtection@dfo-mpo.gc.ca.	
	General		Transport Canada Marine	Navigable Water Protection Officer		100 Front Street South, 1st Floor	Sarnia, ON	N7T 2M4	519-383-1863	NPPONT-PPNONT@tc.gc.ca	
Mr.	Barry	Peter	Windsor Port Authority		Director	3190 Sandwich Street	Windsor, ON	N9C 1A6	519-258-5741 xt.211	pberry@portwindsor.com	
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		darren.winger@ontario.ca	

Title	Surname	First Name	Organization	Department	Job Title	Address	City/Prov	Postal Code	Tel.	E-Mail
Utilities										
	Manzon	Christopher	ENWIN Utilities	Windsor Utilities Commission	Director, Engineering (Water)	787 Ouellette Avenue, PO Box 1625 Stn A	Windsor, ON	N9A 5T7	519-566-3897	cmanzon@enwin.com
	Ogg	Bruce	ENWIN Utilities	Water						bogg@enwin.com
	General		ENWIN Utilities	HYDRO						tsd@enwin.com
	Fuerth	Tyson	Bell Canada		Manager, Network Provisioning	1149 Goyeau Street, PO Box 1601	Windsor, ON	N9A 1H9	519-973-4711	tyson.fuerth@bell.ca
	Markc	Rachel	Bell Canada							rachel.marks@bell.ca
	Kovacs	Aaron	Bell Canada							aaron.kovacs@bell.ca
	Team Email		TELUS							telusutilitymarkups@telecon.ca
	Planning Support		ROGERS							planningsupport.team@rci.rogers.com
	Jones	Mark	MNSI							mjones@mnsi.net
	Hartleib	Dave	MNSI							hartleib@mnsi.net
	Raymond	Frank	Cogeco Cable Services			2225 Dougall Avenue	Windsor, ON	N8X 5A7		raymond.frank@cogeco.com
	Haggins	Daniel	Cogeco Cable Services							daniel.haggins@cogeco.com
	Ceccacci	Will	Union Gas			50 Keil Drive North	Chatham, ON	N7M 5M1		wceccacci@uniongas.com
	Nicholls	Jennifer	Union Gas							jennifer.nicholls@uniongas.com
	Anthony	Clavet	Essex Power							aclavet@essexpowerlines.ca
	MacAulay	Norman	E.L.K Energy		Operations Manager					nmacaulay@elkenergy.com
			Ontario Power Generation							Executivevp.lawanddevelopment@opg.com
			Essex Terminal Railway Company			1601 Lincoln Road	Windsor, ON	N8Y 2J3	519-973-8222	info@etr.ca
	General		Hydro One							Department.SecondaryLandUse@hydroone.com
	Maga	Jessica	Hydro One		Manager-Government Relations					jessica.maga@hydroone.com
Ms.	Susan	Budden	Ontario Clean Water Agency	Southwest Regional Hub Office	Business Development Manager	450 Sunset Drive, Suite 370	St. Thomas ON	N5R 5V1	519-637-8334	sbudden@ocwa.com

Title	Surname	First Name	Organization	Department	Job Title	Address	City/Prov	Postal Code	Tel.	E-Mail	Note
Aboriginal Agencies											
	Mann	Molly	Ministry of Indigenous Affairs Assistant Deputy Minister's Office - Indigenous Relations and Programs Division Indigenous Relations Branch	Manager, Indigenous Relations Unit		Suite 400, 160 Bloor Street East	Toronto, ON	M7A 2E6		molly.mann@ontario.ca	
	Levecque	Heather	Ministry of Indigenous Affairs Assistant Deputy Minister's Office - Indigenous Relations and Programs Division Indigenous Relations Branch	Director, Indigenous Relations		Suite 400, 160 Bloor Street East	Toronto, ON	M7A 2E6	416-325-7032	heather.levecque@ontario.ca	
Ms.	Whiteye	Jennifer	Southern First Nations Secretariat		Executive Director	22361 Austin Line	Bothwell, ON	N0L 1Y0	519-692-5868 x242	jenwhiteye@sfns.on.ca	
First Nation Communities/Métis Groups											
Dr.	Jacobs	Dean	Walpole Island First Nation / Bkejwanong Territory		Heritage Centre Director	117 Tahgahoning Road,R.R. #3	Wallaceburg, ON	N8A 4K9	519-627-1475	dean.jacobs@wifn.org	
	MacBeth	Janet	Walpole Island First Nation / Bkejwanong Territory		Project Review Coordinator	117 Tahgahoning Road,R.R. #3	Wallaceburg, ON	N8A 4K9	519-627-1481	janet.macbeth@wifn.org	
	McCormack	Michelle	Caldwell First Nation		Consultation Coordinator	14 Orange Street	Leamington, ON	N8H 1P5	519-326-1766	consultation@caldwellfirstnation.ca	
	Hamm	Zach	Caldwell First Nation			14 Orange Street	Leamington, ON	N8H 1P5	519-326-1766	ecc2@caldwellfirstnation.ca	
			Caldwell First Nation		Environmental & Consultation Coordinator	14 Orange Street	Leamington, ON	N8H 1P5	519-326-1766	ecc@caldwellfirstnation.ca	
	Plain	Chris	Aamjiwnaang First Nation		Chief	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5	519-336-8410	chief.plain@aamjiwnaang.ca	
Ms.	O'Brien	Cathleen	Aamjiwnaang First Nation		Environmental Coordinator	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5	519-336-8410	cobrien@aamjiwnaang.ca	
Ms.	Jackson	Courtney	Aamjiwnaang First Nation		Environment Worker	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5	519-336-8410	cjackson@aamjiwnaang.ca	
	Burch	Fallon	Chippewas of the Thames First Nation			320 Chippewa Road	Muncey, ON	N0L 1Y0	519-289-5555		Asked to be Removed
	Henry	Jason	Chippewas of Kettle & Stony Point First Nation		Chief	6247 Indian Lane, RR#2	Forest, ON	N0N 1J1	519-786-2125	Jason.Henry@kettlepoint.org	
	George	Valerie	Chippewas of Kettle & Stony Point First Nation		Consultation Coordinator	6247 Indian Lane, RR#2	Forest, ON	N0N 1J1	519-786-2125	valerie.george@kettlepoint.org	
	Chrisjohn	Adrian	Onelda Nation of the Thames ONYOTA'A:KA		Chief	2212 Elm Avenue	Southwold, ON	N0L 2G0	519-318-4598	adrian.chrisjohn@oneida.on.ca	
	Hill	Cherilyn	Onelda Nation of the Thames ONYOTA'A:KA		Political Office Manager	2212 Elm Avenue	Southwold, ON	N0L 2G0	(519) 318-4593	cherilyn.hill@oneida.on.ca	
	Froh	Margaret	Métis Nation of Ontario		Director, Lands, Resources and Consultations	75 Sherbourne Street, Suite 311	Toronto, ON	M5A 2P9	416-977-9881	margaretF@metisnation.org	
			MNO Windsor-Essex Métis Council							consultations@metisnation.org	
	Anderson	Kathleen	Métis Nation of Ontario, Thames Bluewater Métis Council		President	183 Summerset Crescent	London, ON	N6K 3S5		tbwmc.president@gmail.com	
Ms.	Stonefish	Denise	Moravian of the Thames (Delaware Nation)		Chief	14760 School House Line, RR 3	Thamesville, ON	N0P 2K0	519-692-3936	denise.stonefish@delawarenation.on.ca	

APPENDIX C

Mailout Packages to Local Residents

1. Mailout Package – Notice of Commencement
2. Mailout Package – Notice of PIC No. 1
3. Mailout Package – Notice of PIC No. 2

Stantec

Stantec Consulting Ltd.
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

January 28, 2022

Project/File: 165620239

Name
Address

Dear Name,

Reference: Notice of Study Commencement
Class Environmental Assessment –
St. Rose Storm Water Pumping Station, City of Windsor

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will involve evaluation of site selection and alternative design concepts for the proposed St. Rose Storm Water Pumping Station. A copy of the Notice of Study Commencement for the project is attached.

On behalf of the City of Windsor, 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.

If you have any comments or concerns regarding this project and wish to provide input into the Study, please contact the undersigned or one of the individuals named in the enclosed material.

Sincerely,

Chrissy Jung

Chrissy Jung M.A.Sc., E.I.T.
Environmental Engineer in Training
Phone: (519) 966-2250
Mobile: 519-567-9537
Chrissy.jung@stantec.com

Attachment: Notice of Study Commencement, Response Form

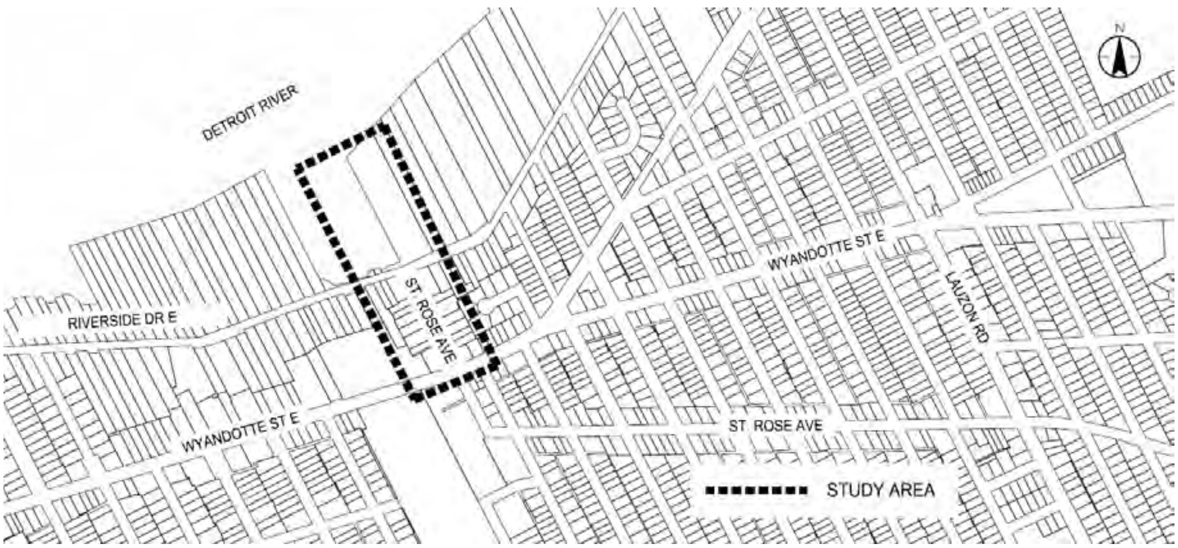
c. Mr. Ed Valdez, Manager of Process Engineering & Maintenance, City of Windsor

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF STUDY COMMENCEMENT

The City of Windsor is undertaking a Schedule C Municipal Class Environmental Assessment (Class EA) for the proposed St. Rose Pumping Station. This study will satisfy Phases 3 and 4 of the Class EA process which will involve the evaluation of site selection and alternative design concepts for the proposed St. Rose Stormwater Pumping Station. An Environmental Study Report will be prepared to document the activities and recommendations from the Class EA process.

The City of Windsor endorsed its first comprehensive Sewer and Coastal Flood Protection Master Plan (SMP) in 2020. The SMP was completed in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment process. The SMP identified specific improvement projects that can be undertaken by the City to improve efficiency and reduce the risk of flooding caused by severe storm events. It is outlined in the SMP that a new stormwater pumping station within the study area (refer to key map) is required to discharge excess water during major storm events in the expanded St. Rose drainage area.



This Notice of Study Commencement continues the public consultation process for this project. Following this Notice, the public will be invited to a Virtual Public Information Centre (PIC) to review the evaluation of site selection and to submit any questions and comments.

If you have any questions or if you wish to be added to the study mailing list, please contact:

Janelle Coombs, P.Eng.
Project Administrator, City of Windsor
350 City Hall Square West, Suite 310
Windsor, ON N9A 6S1
519-255-6100 x 6004
jcoombs@citywindsor.ca

Jian Li, Ph.D., P. Eng.
Stantec Consulting, Project Manager
2555 Ouellette Avenue, Suite 100
Windsor, Ontario N8X 1L9
519-966-2250 x 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.

Stantec Consulting Ltd.
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

February 22, 2022

Project/File: 165620239

Name
Address

Dear Name,

Reference: Notice of Public Information Centre
Class Environmental Assessment –
St. Rose Storm Water Pumping Station, City of Windsor

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will involve evaluation of site selection and alternative design concepts for the proposed St. Rose Storm Water Pumping Station.

The City is hosting a Public Information Centre (PIC) to present the evaluation of site selection for the St. Rose Pumping Station and receive input from interested residents and stakeholders. The PIC will be held on Wednesday March 2, 2022 (3:00 to 7:00 pm) at the WFCU Centre, Michigan Room, 8787 McHugh Street, Windsor, ON. A copy of the Notice of Virtual Public Information Centre for the project is attached.

If you have any comments or concerns regarding this project or wish to attend a Public Information Centre, please contact the undersigned.

Sincerely,

Chrissy Jung

Chrissy Jung M.A.Sc., E.I.T.
Environmental Engineer in Training
Phone: (519) 966-2250
Mobile: 519-567-9537
chrissy.jung@stantec.com

Attachment: Notice of Public Information Center, Response Form

c. Mr. Ed Valdez, Manager of Process Engineering & Maintenance, City of Windsor

ST. ROSE STORMWATER PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE

The City of Windsor is undertaking a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the proposed St. Rose Pumping Station. This study will satisfy Phases 3 and 4 of the Class EA process which will involve the evaluation of site alternatives and design concept alternatives for the proposed St. Rose Stormwater Pumping Station. An Environmental Study Report will be prepared to document the activities and recommendations from the Class EA process. The City of Windsor endorsed its first comprehensive Sewer and Coastal Flood Protection Master Plan (SMP) in 2020. The SMP was completed in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment process. It outlined that a new stormwater pumping station is required to discharge excess water during major storm events in the expanded St. Rose drainage area.

The City is hosting a Public Information Centre (PIC) to present the evaluation of site alternatives for the St. Rose Pumping Station. 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 2, 2022
3:00 p.m. – 7:00 p.m.
WFCU Centre, Michigan Room
8787 McHugh Street, Windsor, ON

Information regarding this Environmental Assessment can be found on the City's project website:
https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

Following the PIC, comments are welcomed and will be received until March 17, 2022.

For further information, please contact:

Janelle Coombs, P.Eng.
Project Administrator, City of Windsor
350 City Hall Square West, Suite 310
Windsor, ON N9A 6S1
519-255-6100 x 6004
jcoombs@citywindsor.ca

Jian Li, Ph.D., P. Eng.
Stantec Consulting, Project Manager
2555 Ouellette Avenue, Suite 100
Windsor, Ontario N8X 1L9
519-966-2250 x 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

ST. ROSE STORMWATER PUMPING STATION

To address widespread flooding issues during extreme storm events, the City completed a comprehensive study known as the Sewer & Coastal Flood Protection Master Plan (SMP). The SMP identified the need for a new stormwater pumping station and new storm sewer outlet to the Detroit River to service the St. Rose drainage area. The City is undertaking the Municipal Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will determine the location and overall design concept of the proposed pumping station for the St. Rose drainage area.

THANK YOU

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 project website below:

https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

Please return your completed comment form on or before **July 13, 2022**, to:

Chrissy Jung, M.A.Sc., E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 519-567-9537
chrissy.jung@stantec.com

Attention: Chrissy Jung
Stantec Consulting Ltd.
2555 Ouellette Avenue, Unit 100
Windsor ON
N8X 1L9

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE NO. 2 – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

____

____

____

____

____

____

____

____

____

____

____

____

____

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

June 10th, 2022

Project/File: 165620239

WINDSOR CITY,
PARKS & RECREATION DEPT
2450 MCDOUGALL ST

Dear WINDSOR CITY,

Reference: Notice of Public Information Centre No. 2
Class Environmental Assessment –
St. Rose Storm Water Pumping Station, City of Windsor

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area.

The City is hosting a Public Information Centre (PIC) to present alternative design concepts for the St. Rose Pumping Station and receive input from interested residents and stakeholders. The PIC will be held on Thursday June 23rd, 2022 (3:00 to 7:00 pm) at the WFCU Centre, Michigan Room, 8787 McHugh Street, Windsor, ON. A copy of the Notice of Virtual Public Information Centre No. 2 and a Feedback Form for the project is attached.

If you have any comments or concerns regarding this project, please contact the undersigned.

Sincerely,

Chrissy Jung

Chrissy Jung M.A.Sc., E.I.T.
Environmental Engineer in Training
Phone: (519) 966-2250
Mobile: 519-567-9537
chrissy.jung@stantec.com

Attachment: Notice of Public Information Center, Feedback Form

c. Mr. Ed Valdez, Manager of Process Engineering & Maintenance, City of Windsor

ST. ROSE STORMWATER PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF PUBLIC INFORMATION CENTRE No. 2

The City of Windsor is undertaking a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the proposed St. Rose Pumping Station. The City of Windsor endorsed its first comprehensive Sewer and Coastal Flood Protection Master Plan (SMP) in 2020. The SMP was completed in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment process. It outlined that a new stormwater pumping station is required to discharge excess water during major storm events in the expanded St. Rose drainage area. This study will satisfy Phases 3 and 4 of the Class EA process which will involve the evaluation of site alternatives and design concept alternatives for the proposed St. Rose Stormwater Pumping Station. An Environmental Study Report will be prepared to document the activities and recommendations from the Class EA process.

The City is hosting a second Public Information Centre (PIC) to present the design concept alternatives for the St. Rose Pumping Station. Consultation is an integral part of the class 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
Thursday June 23rd, 2022
3:00 p.m. – 7:00 p.m.
WFCU Centre, Michigan Room
8787 McHugh Street, Windsor, ON

Information regarding this Environmental Assessment can be found on the City's project website:
https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

Following the PIC, comments are welcomed and will be received until July 13th, 2022.

For further information, please contact:

Janelle Coombs, P.Eng.
Project Administrator, City of Windsor
350 City Hall Square West, Suite 310
Windsor, ON N9A 6S1
519-255-6100 x 6004
jcoombs@citywindsor.ca

Jian Li, Ph.D., P. Eng.
Stantec Consulting, Project Manager
2555 Ouellette Avenue, Suite 100
Windsor, Ontario N8X 1L9
519-966-2250 x 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

ST. ROSE STORMWATER PUMPING STATION

To address widespread flooding issues during extreme storm events, the City completed a comprehensive study known as the Sewer & Coastal Flood Protection Master Plan (SMP). The SMP identified the need for a new stormwater pumping station and new storm sewer outlet to the Detroit River to service the St. Rose drainage area. The City is undertaking the Municipal Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will determine the location and overall design concept of the proposed pumping station for the St. Rose drainage area.

THANK YOU

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 project website below:

https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

Please return your completed comment form on or before **July 13, 2022**, to:

Chrissy Jung, M.A.Sc., E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 519-567-9537
chrissy.jung@stantec.com

Attention: Chrissy Jung
Stantec Consulting Ltd.
2555 Ouellette Avenue, Unit 100
Windsor ON
N8X 1L9

Stantec

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE NO. 2 – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

NAME ____________________

EMAIL ADDRESS ____________________

TELEPHONE NO. (   ) ____________________

DATE____________________SIGNATURE ____________________

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 C

Response from Review Agencies – Notice of Project Commencement

Ministry of the Environment, Conservation and Parks

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Environmental Assessment Branch

Direction des évaluations environnementales

1st Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
Tel.:   416 314-8001
Fax.:   416 314-8452

Rez-de-chaussée
135, avenue St. Clair Ouest
Toronto ON M4V 1P5
Tél. :   416 314-8001
Téléc. : 416 314-8452

February 15, 2022

Janelle Coombs
Project Administrator
City of Windsor
jcoombs@citywindsor.ca

Re: **St. Rose Stormwater Pumping Station**
City of Windsor
Municipal Class EA
Response to Notice of Commencement

Dear Janelle Coombs,

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 City of Windsor (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 (February 2021)** 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 subsequent to 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

- A Part II Order request is expected on the basis of 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.

Yours truly,

Mark Badali

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, Stantec Consulting, Project Manager

Encl. Areas of Interest
A Proponent's Introduction to the Delegation of Procedural Aspects of Consultation with Aboriginal Communities

AREAS OF INTEREST (v. February 2021)

It is suggested that you check off each section after you have considered / addressed it.

☐ **Planning and Policy**

- Projects located in MECP Central Region are subject to **A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020).** Parts of the study area may also be subject to the Oak Ridges Moraine Conservation Plan (2017), Niagara Escarpment Plan (2017), Greenbelt Plan (2017) or Lake Simcoe Protection Plan (2014). Applicable plans and the applicable policies should be identified in the report, and the proponent should describe how the proposed project adheres to the relevant policies in these plans.

- 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 this mapping tool: http://www.applications.ene.gov.on.ca/swp/en/index.php. 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, 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 (for projects in MECP Southwest Region, the email is eanotification.swregion@ontario.ca).

The public has the ability to 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 Part II 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, Part II Order requests on those matters should be addressed in writing to:

Minister Jeff Yurek
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

A PROPONENT'S INTRODUCTION TO THE DELEGATION OF PROCEDURAL ASPECTS OF CONSULTATION WITH ABORIGINAL COMMUNITIES

DEFINITIONS

The following definitions are specific to this document and may not apply in other contexts:

Aboriginal communities – the First Nation or Métis communities identified by the Crown for the purpose of consultation.

Consultation – the Crown's legal obligation to consult when the Crown has knowledge of an established or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. This is the type of consultation required pursuant to s. 35 of the *Constitution Act, 1982*. Note that this definition does not include consultation with Aboriginal communities for other reasons, such as regulatory requirements.

Crown – the Ontario Crown, acting through a particular ministry or ministries.

Procedural aspects of consultation – those portions of consultation related to the process of consultation, such as notifying an Aboriginal community about a project, providing information about the potential impacts of a project, responding to concerns raised by an Aboriginal community and proposing changes to the project to avoid negative impacts.

Proponent – the person or entity that wants to undertake a project and requires an Ontario Crown decision or approval for the project.

I. PURPOSE

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that may adversely impact that right. In outlining a framework for the duty to consult, the Supreme Court of Canada has stated that the Crown may delegate procedural aspects of consultation to third parties. This document provides general information about the Ontario Crown's approach to delegation of the procedural aspects of consultation to proponents.

This document is not intended to instruct a proponent about an individual project, and it does not constitute legal advice.

II. WHY IS IT NECESSARY TO CONSULT WITH ABORIGINAL COMMUNITIES?

The objective of the modern law of Aboriginal and treaty rights is the *reconciliation* of Aboriginal peoples and non-Aboriginal peoples and their respective rights, claims and interests. Consultation is an important component of the reconciliation process.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. For example, the Crown's duty to consult is triggered when it considers issuing a permit, authorization or approval for a project which has the potential to adversely impact an Aboriginal right, such as the right to hunt, fish, or trap in a particular area.

The scope of consultation required in particular circumstances ranges across a spectrum depending on both the nature of the asserted or established right and the seriousness of the potential adverse impacts on that right.

Depending on the particular circumstances, the Crown may also need to take steps to accommodate the potentially impacted Aboriginal or treaty right. For example, the Crown may be required to avoid or minimize the potential adverse impacts of the project.

III. THE CROWN'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

The Crown has the responsibility for ensuring that the duty to consult, and accommodate where appropriate, is met. However, the Crown may delegate the procedural aspects of consultation to a proponent.

There are different ways in which the Crown may delegate the procedural aspects of consultation to a proponent, including through a letter, a memorandum of understanding, legislation, regulation, policy and codes of practice.

If the Crown decides to delegate procedural aspects of consultation, the Crown will generally:

- Ensure that the delegation of procedural aspects of consultation and the responsibilities of the proponent are clearly communicated to the proponent;
- Identify which Aboriginal communities must be consulted;
- Provide contact information for the Aboriginal communities;
- Revise, as necessary, the list of Aboriginal communities to be consulted as new information becomes available and is assessed by the Crown;
- Assess the scope of consultation owed to the Aboriginal communities;
- Maintain appropriate oversight of the actions taken by the proponent in fulfilling the procedural aspects of consultation;
- Assess the adequacy of consultation that is undertaken and any accommodation that may be required;
- Provide a contact within any responsible ministry in case issues arise that require direction from the Crown; and
- Participate in the consultation process as necessary and as determined by the Crown.

IV. THE PROPONENT'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

Where aspects of the consultation process have been delegated to a proponent, the Crown, in meeting its duty to consult, will rely on the proponent's consultation activities and documentation of those activities. The consultation process informs the Crown's decision of whether or not to approve a proposed project or activity.

A proponent's role and responsibilities will vary depending on a variety of factors including the extent of consultation required in the circumstance and the procedural aspects of consultation the Crown has delegated to it. Proponents are often in a better position than the Crown to discuss a project and its potential impacts with Aboriginal communities and to determine ways to avoid or minimize the adverse impacts of a project.

A proponent can raise issues or questions with the Crown at any time during the consultation process. If issues or concerns arise during the consultation that cannot be addressed by the proponent, the proponent should contact the Crown.

a) What might a proponent be required to do in carrying out the procedural aspects of consultation?

Where the Crown delegates procedural aspects of consultation, it is often the proponent's responsibility to provide notice of the proposed project to the identified Aboriginal communities. The notice should indicate that the Crown has delegated the procedural aspects of consultation to the proponent and should include the following information:

- a description of the proposed project or activity;
- mapping;
- proposed timelines;
- details regarding anticipated environmental and other impacts;
- details regarding opportunities to comment; and
- any changes to the proposed project that have been made for seasonal conditions or other factors, where relevant.

Proponents should provide enough information and time to allow Aboriginal communities to provide meaningful feedback regarding the potential impacts of the project. Depending on the nature of consultation required for a project, a proponent also may be required to:

- provide the Crown with copies of any consultation plans prepared and an opportunity to review and comment;
- ensure that any necessary follow-up discussions with Aboriginal communities take place in a timely manner, including to confirm receipt of information, share and update information and to address questions or concerns that may arise;

- as appropriate, discuss with Aboriginal communities potential mitigation measures and/or changes to the project in response to concerns raised by Aboriginal communities;
- use language that is accessible and not overly technical, and translate material into Aboriginal languages where requested or appropriate;
- bear the reasonable costs associated with the consultation process such as, but not limited to, meeting hall rental, meal costs, document translation(s), or to address technical & capacity issues;
- provide the Crown with all the details about potential impacts on established or asserted Aboriginal or treaty rights, how these concerns have been considered and addressed by the proponent and the Aboriginal communities and any steps taken to mitigate the potential impacts;
- provide the Crown with complete and accurate documentation from these meetings and communications; and
- notify the Crown immediately if an Aboriginal community not identified by the Crown approaches the proponent seeking consultation opportunities.

b) What documentation and reporting does the Crown need from the proponent?

Proponents should keep records of all communications with the Aboriginal communities involved in the consultation process and any information provided to these Aboriginal communities.

As the Crown is required to assess the adequacy of consultation, it needs documentation to satisfy itself that the proponent has fulfilled the procedural aspects of consultation delegated to it. The documentation required would typically include:

- the date of meetings, the agendas, any materials distributed, those in attendance and copies of any minutes prepared;
- the description of the proposed project that was shared at the meeting;
- any and all concerns or other feedback provided by the communities;
- any information that was shared by a community in relation to its asserted or established Aboriginal or treaty rights and any potential adverse impacts of the proposed activity, approval or disposition on such rights;
- any proposed project changes or mitigation measures that were discussed, and feedback from Aboriginal communities about the proposed changes and measures;
- any commitments made by the proponent in response to any concerns raised, and feedback from Aboriginal communities on those commitments;
- copies of correspondence to or from Aboriginal communities, and any materials distributed electronically or by mail;

- information regarding any financial assistance provided by the proponent to enable participation by Aboriginal communities in the consultation;
- periodic consultation progress reports or copies of meeting notes if requested by the Crown;
- a summary of how the delegated aspects of consultation were carried out and the results; and
- a summary of issues raised by the Aboriginal communities, how the issues were addressed and any outstanding issues.

In certain circumstances, the Crown may share and discuss the proponent's consultation record with an Aboriginal community to ensure that it is an accurate reflection of the consultation process.

c) Will the Crown require a proponent to provide information about its commercial arrangements with Aboriginal communities?

The Crown may require a proponent to share information about aspects of commercial arrangements between the proponent and Aboriginal communities where the arrangements:

- include elements that are directed at mitigating or otherwise addressing impacts of the project;
- include securing an Aboriginal community's support for the project; or
- may potentially affect the obligations of the Crown to the Aboriginal communities.

The proponent should make every reasonable effort to exempt the Crown from confidentiality provisions in commercial arrangements with Aboriginal communities to the extent necessary to allow this information to be shared with the Crown.

The Crown cannot guarantee that information shared with the Crown will remain confidential. Confidential commercial information should not be provided to the Crown as part of the consultation record if it is not relevant to the duty to consult or otherwise required to be submitted to the Crown as part of the regulatory process.

V. WHAT ARE THE ROLES AND RESPONSIBILITIES OF ABORIGINAL COMMUNITIES' IN THE CONSULTATION PROCESS?

Like the Crown, Aboriginal communities are expected to engage in consultation in good faith. This includes:

- responding to the consultation notice;
- engaging in the proposed consultation process;
- providing relevant documentation;

- clearly articulating the potential impacts of the proposed project on Aboriginal or treaty rights; and
- discussing ways to mitigates any adverse impacts.

Some Aboriginal communities have developed tools, such as consultation protocols, policies or processes that provide guidance on how they would prefer to be consulted. Although not legally binding, proponents are encouraged to respect these community processes where it is reasonable to do so. Please note that there is no obligation for a proponent to pay a fee to an Aboriginal community in order to enter into a consultation process.

To ensure that the Crown is aware of existing community consultation protocols, proponents should contact the relevant Crown ministry when presented with a consultation protocol by an Aboriginal community or anyone purporting to be a representative of an Aboriginal community.

VI. WHAT IF MORE THAN ONE PROVINCIAL CROWN MINISTRY IS INVOLVED IN APPROVING A PROPONENT'S PROJECT?

Depending on the project and the required permits or approvals, one or more ministries may delegate procedural aspects of the Crown's duty to consult to the proponent. The proponent may contact individual ministries for guidance related to the delegation of procedural aspects of consultation for ministry-specific permits/approvals required for the project in question. Proponents are encouraged to seek input from all involved Crown ministries sooner rather than later.

Ministry of Northern Development, Mines, Natural Resources and Forestry

Ministère du Développement du Nord, des Mines, des Richesses naturelles et des Forêts

Ontario

March 22, 2022

Chrissy Jung
Stantec Consulting
2555 Ouellette Avenue, Suite 100
Windsor, Ontario N8X 1L9
Chrissy.Jung@stantec.com

Subject: Municipal Class EA for St. Rose Stormwater Pumping Station

Dear Chrissy,

The Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) received the Notice of Study Commencement for the St. Rose Stormwater Pumping Station on January 28, 2022. Thank for you for circulating this notice to our office, please note we have not completed a screening of natural heritage or other resource values for the project at this time. This response, however, does provide information to guide you in identifying and assessing natural features and resources as required by applicable policies and legislation and engaging with the Ministry for advice as needed.

Please also note 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, ANSIs, woodlands, etc.) using the Natural Heritage Make a Map tool.

We recommend 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 you consider these technical guides as you assess specific improvement projects that can be undertaken by the City to reduce the risk of flooding.

Petroleum Wells & Oil, Gas and Salt Resource 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 in order to better understand the well information available. Any oil and gas wells in your project area are regulated by the *Oil, Gas 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

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 the work area (including amphibians, reptiles, and small mammals), a Wildlife Collector's Authorization under the Fish and Wildlife Conservation Act will also be required.

Public Lands Act & Lakes and Rivers Improvement Act

Some projects may be subject to the provisions of the *Public Lands Act* or *Lakes and Rivers Improvement Act*. Please review the information on NDMNRF's web pages provided below regarding when an approval is required or not. Please note many of the authorizations issued 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/document/lakes-and-rivers-improvement-act-administrative-guide

After reviewing the information provided, if you have not identified any of NDMNRF's interests stated above, there is no need to circulate any subsequent notices to our office. If you have identified any of NDMNRF's interests stated above and may require permit(s), please contact mnrf.aly@ontario.ca.

If you have any questions or concerns, please feel free to contact me.

Sincerely,

Sadie Brown
District Planner
Ministry of Northern Development, Mines, Natural Resources and Forestry
E-mail: sadie.brown@ontario.ca

Ministry of Heritage, Sport, Tourism and Culture Industries

Programs and Services Branch
400 University Ave, 5th Flr
Toronto, ON M7A 2R9
Tel: 437.996.5218

Ministère des Industries du Patrimoine, du Sport, du Tourisme et de la Culture

Direction des programmes et des services
400, av. University, 5e étage
Toronto, ON M7A 2R9
Tél: 437.996.5218

March 2, 2022 EMAIL ONLY

Jian Li
Project Manager
Stantec Consulting
2555 Ouellette Avenue, Suite 100
Windsor, Ontario N8X 1L9
jian.li@stantec.com

MHSTCI File	:	**0016075**
Proponent	:	**City of Windsor**
Subject	:	**Notice of Commencement – Schedule C MCEA**
Project	:	**St. Rose Storm Water Pumping Station**
Location	:	**Windsor, Ontario**

Dear Dr. Li:

Thank you for providing the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) with the Notice of Commencement for the above-referenced project. MHSTCI'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 City of Windsor is undertaking a Schedule C Municipal Class Environmental Assessment (Class EA) for the proposed St. Rose Pumping Station. This study will satisfy Phases 3 and 4 of the Class EA process which will involve the evaluation of site selection and alternative design concepts for the proposed St. Rose Stormwater Pumping Station.

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
MHSTCI understands that a Stage 1 Archaeological Assessment (AA) (under Project Information Number P-359-0117-2019 by Fisher Archaeological Consulting dated August, 2021) was completed as part of the City of Windsor Sewer Master Plan. A Stage 2 AA (under Project Information Number P256-0697-2021) is being undertaken as part of the St. Rose Storm Water Pumping Station.

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:

i. the archaeological assessment of the project area is complete and
ii. 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.

Built Heritage Resources and Cultural Heritage Landscapes

The MHSTCI *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* should be completed to help determine whether this EA project may impact built heritage resources and/or 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. MHSTCI 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, MHSTCI 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 MHSTCI whether any technical cultural heritage studies will be completed for this EA project, and provide them to MHSTCI 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 MHSTCI 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,

Laura Romeo
Heritage Planner (A)
Heritage Planning Unit
laura.romeo@ontario.ca

Copied to: Janelle Coombs, Project Administrator, City of Windsor
Karla Barboza, Team Lead (A), Heritage Planning Unit, MHSTCI

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. MHSTCI 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 MHSTCI 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.

Please notify MHSTCI (at archaeology@ontario.ca) if archaeological resources are impacted by EA project work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out an archaeological assessment in accordance with the Ontario Heritage Act and the Standards and Guidelines for Consultant Archaeologists.

If human remains are encountered, all activities must cease immediately, and the local police and coroner must be contacted. In situations where human remains are associated with archaeological resources, MHSTCI should also be notified (at archaeology@ontario.ca) to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.

Hydro One Networks Inc
483 Bay St
Toronto, ON

March 03, 2022

Re: ST. ROSE STORM WATER PUMPING STATION

Attention:
Jian Li, Ph.D., P. Eng.
Stantec Consulting, Project Manager

Thank you for sending us notification regarding (ST. ROSE STORM WATER PUMPING STATION). In our preliminary assessment, we confirm there are no existing Hydro One Transmission assets in the subject area. Please be advised that this is only a preliminary assessment based on current information.

If plans for the undertaking change or the study area expands beyond that shown, please contact Hydro One to assess impacts of existing or future planned electricity infrastructure.

Any future communications are sent to Secondarylanduse@hydroone.com.

Be advised that any changes to lot grading and/or drainage within proximity to Hydro One transmission corridor lands must be controlled and directed away from the transmission corridor.

Sent on behalf of,

Secondary Land Use
Asset Optimization
Strategy & Integrated Planning
Hydro One Networks Inc.

From:	FPP.CA / PPP.CA (DFO/MPO)
To:	Jung, Chrissy
Subject:	RE: 165620239: Notice of Public Information Centre - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario
Date:	Tuesday, February 22, 2022 1:13:36 PM

Hello Chrissy,

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,

Deborah Silver
Biologist | Biologiste
Fisheries and Oceans Canada| Pêches et Océans Canada
Fish and Fish Habitat Protection Program| Programme de protection du poisson et de son habitat

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: Jung, Chrissy <Chrissy.Jung@stantec.com>
Sent: Tuesday, February 22, 2022 9:04 AM
Subject: 165620239: Notice of Public Information Centre - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

To Whom it May Concern,

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the

St. Rose drainage area. This Class EA will involve evaluation of site alternatives and alternative design concepts for the proposed St. Rose Storm Water Pumping Station.

The City is hosting a Public Information Centre (PIC) to present the evaluation of site alternatives and receive input from interested residents and stakeholders. The PIC will be held on Wednesday March 2, 2022 (3:00 to 7:00 pm) at the WFCU Centre, 8787 McHugh Street, Windsor, ON (Second Floor – Michigan Room). A copy of the Notice of Public Information Centre for the project is attached and additional information regarding the project is available on the City Webpage: St. Rose Storm Water Pumping Station Environmental Assessment (citywindsor.ca).

If you have any comments or concerns regarding this project, please contact the undersigned.
Sincerely,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From:	NPP ONT / PPN ONT
To:	Jung, Chrissy
Cc:	ONT Environment / Environnement ONT
Subject:	RE: 165620239: Notice of Public Information Centre - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario
Date:	Tuesday, February 22, 2022 9:58:32 AM

Good morning Chrissy,

The Navigation Protection Program (NPP) is responsible for the administration of the *Canadian Navigable Waters Act* (CNWA), which prohibits the construction or placement of any "works" in, on, over, under, through, or across a navigable waterway without complying with the requirements of the Act. The Navigation Protection Program also maintains responsibility for provisions of the *Wrecked, Abandoned or Hazardous Vessels Act* (WAHVA), as well as the Private Buoy Regulations under the *Canada Shipping Act, 2001*.

In the event that your project involves a navigable waterway, it is important to note that you have responsibilities under the CNWA.

To determine the required approvals/authorizations required, please go to our external submission site, create an account and complete the "Project Review Tool". This tool will guide you to the appropriate process to ensure your projects compliance with the CNWA.

If you have any other questions please feel free to contact us.

Regards

Cal Fenwick

Officer | Agent
Navigation Protection Program | Programme de protection de la navigation
Transport Canada | Transports Canada
100 Front St. S., Sarnia ON N7T 2M4
Government of Canada | Gouvernement du Canada

From: Jung, Chrissy <Chrissy.Jung@stantec.com>
Sent: Tuesday, February 22, 2022 9:04 AM
Subject: 165620239: Notice of Public Information Centre - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

To Whom it May Concern,

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will involve evaluation of site alternatives and alternative design concepts for the proposed St. Rose Storm Water Pumping Station.

The City is hosting a Public Information Centre (PIC) to present the evaluation of site alternatives and receive input from interested residents and stakeholders. The PIC will be held on Wednesday March 2, 2022 (3:00 to 7:00 pm) at the WFCU Centre, 8787 McHugh Street, Windsor, ON (Second Floor – Michigan Room). A copy of the Notice of Public Information Centre for the project is attached and additional information regarding the project is available on the City Webpage: St. Rose Storm Water Pumping Station Environmental Assessment (citywindsor.ca).

If you have any comments or concerns regarding this project, please contact the undersigned.
Sincerely,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From: Peter Berry
To: Jung, Chrissy
Subject: RE: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario
Date: Monday, January 31, 2022 5:11:45 PM
Attachments: image001.png
image002.png

Good day Chrissy

Please include me as the contact for the Windsor Port Authority.

Thank you

Peter Berry
Harbour Master/ Capitaine de Port
Director- Port Operations/ Directeur des opérations portuaires

Windsor Port Authority/ Administration Portuaire de Windsor
office/bureau (519) 258-5741 ext 211
cell (519) 562-3032
www.portwindsor.com

Canada

From: Jung, Chrissy <Chrissy.Jung@stantec.com>
Sent: Monday, January 31, 2022 10:35 AM
To: Peter Berry <pberry@portwindsor.com>
Subject: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

Dear Peter Barry,

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will involve evaluation of site selection and alternative design concepts for the proposed St. Rose Storm Water Pumping Station. A copy of the Notice of Study Commencement for the project is attached.

On behalf of the City of Windsor, 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.

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,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From:	James Bryant
To:	Jung, Chrissy
Subject:	RE: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario
Date:	Monday, January 31, 2022 12:17:27 PM

Thanks; you too.

—
JB

JAMES BRYANT, P.Eng.
Director of Watershed Management Services
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 | Essex, Ontario | N8M 1Y6
P. 519-776-5209 x 246 | F. 519-776-8688
jbryant@erca.org www.essexregionconservation.ca

While this email is sent when it is convenience for me, I do not expect a response or action outside of your own regular working hours.

COVID-19 Notice: Please be advised that the ERCA Administration Office is closed to the public until further notice. Staff are currently working remotely to continue delivering services during this time. Please monitor the ERCA website and media releases to stay up-to-date on any changes to ERCA service delivery. We sincerely apologize for any potential inconvenience this may cause.

From: Jung, Chrissy <Chrissy.Jung@stantec.com>
Sent: Monday, January 31, 2022 12:15 PM
To: James Bryant <JBryant@erca.org>
Subject: RE: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

Hi James,

Noted! Thank you and have a nice day.

Cheers,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From: James Bryant <JBryant@erca.org>
Sent: Monday, January 31, 2022 12:13 PM
To: Jung, Chrissy <Chrissy.Jung@stantec.com>
Subject: RE: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

Good afternoon Chrissy,

For this particular study, I think having items circulated through those two individuals below will be sufficient unless otherwise noted in the future. Thanks so much.

Cheers,

—
James

JAMES BRYANT, P.Eng.
Director of Watershed Management Services
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 | Essex, Ontario | N8M 1Y6
P. 519-776-5209 x 246 | F. 519-776-8688
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From: Jung, Chrissy <Chrissy.Jung@stantec.com>
Sent: Monday, January 31, 2022 12:01 PM
To: James Bryant <JBryant@erca.org>
Cc: Planning <planning@ERCA.org>; Tian Martin <TMartin@erca.org>
Subject: RE: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

Hello James,

Thank you for your response. I have added Tian Martin and the Planning Inbox to our study mailing list.

Just to confirm: moving forward would you like to continue receiving these emails?

Thank You,

Chrissy Jung M.A.Sc., E.I.T.

Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From: James Bryant <JBryant@erca.org>
Sent: Saturday, January 29, 2022 11:23 AM
To: Jung, Chrissy <Chrissy.Jung@stantec.com>
Cc: Planning <planning@ERCA.org>; Tian Martin <TMartin@erca.org>
Subject: RE: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

Hi Chrissy,

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. 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

Thank you and have a good weekend.

Cheers,

__
James

JAMES BRYANT, P.Eng.
Director of Watershed Management Services
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 | Essex, Ontario | N8M 1Y6
P. 519-776-5209 x 246 | F. 519-776-8688
jbryant@erca.org www.essexregionconservation.ca

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From: Jung, Chrissy <Chrissy.Jung@stantec.com>
Sent: Friday, January 28, 2022 5:06 PM
To: James Bryant <JBryant@erca.org>
Subject: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

Dear James Bryant,

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will involve evaluation of site selection and alternative design concepts for the proposed St. Rose Storm Water Pumping Station. A copy of the Notice of Study Commencement for the project is attached.

On behalf of the City of Windsor, 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.

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,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From:	Peter Marra
To:	Jung, Chrissy
Cc:	Jonathan Osborne; Michael Cappucci
Subject:	RE: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario
Date:	Monday, January 31, 2022 8:45:59 AM
Attachments:	Notice of Study Commencement - St. Rose Pumping Station.pdf

Chrissy,

Thank-you for circulating this to LaSalle.

If through the project you determine any effects on LaSalle with respect to cost, drainage, downstream effects, etc. to name a few, we would appreciate having those discussion with your team once info is shared.

But seeing this is on the City's far east end, I suspect there is probably minimal effect on LaSalle.

Regards,

Peter Marra, P.Eng.
Deputy Chief Administrative Officer
Town of LaSalle

From: Jung, Chrissy <Chrissy.Jung@stantec.com>
Sent: January 28, 2022 5:03 PM
To: Peter Marra <pmarra@lasalle.ca>
Subject: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

Dear Peter Marra,

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will involve evaluation of site selection and alternative design concepts for the proposed St. Rose Storm Water Pumping Station. A copy of the Notice of Study Commencement for the project is attached.

On behalf of the City of Windsor, 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.

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,

Chrissy Jung M.A.Sc., E.I.T.

Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From:	Allan Botham
To:	Jung, Chrissy
Cc:	Li, Jian; Coombs, Janelle; Sumaiya Habiba
Subject:	RE: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario
Date:	Monday, January 31, 2022 1:00:31 PM
Attachments:	image002.png image003.png Twitter_7d425643-44d5-4c71-bf70-80ddc2b5b0c511111111.png Facebook_f1ab0de0-1179-48a2-a981-bbf05129d66c11111111.png

HI again Chrissy,

Please make the County of Essex primary contact to be:

Sumaiya Habib
Environmental Coordinator
County of Essex
519-776-6441, ext 1385

Thanks,
Allan.

Allan Botham
Director, Infrastructure & Planning
County of Essex
360 Fairview Ave. W. Suite 315 | Essex, ON | N8M 1Y6
P: 519-776-6441 ext. 1397
F: 519-776-4455
TTY: 1-877-624-4832

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From: Jung, Chrissy <Chrissy.Jung@stantec.com>
Sent: January 31, 2022 11:38 AM
To: Allan Botham <ABotham@countyofessex.ca>
Cc: Li, Jian <jian.li@stantec.com>; Coombs, Janelle <jcoombs@citywindsor.ca>
Subject: RE: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

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Hello Allan,

Thank you for your response. We will keep you on the mailing list for this project so that you will continue to be informed.

Stantec has extended invitations to all municipalities in Windsor - Essex County to ensure they have the opportunity to participate in this study.

Thank You,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From: Allan Botham <ABotham@countyofessex.ca>
Sent: Sunday, January 30, 2022 10:18 PM
To: Jung, Chrissy <Chrissy.Jung@stantec.com>
Subject: RE: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

Hi Chrissy,
The County of Essex would be happy to participate with you and the City of Windsor in this project. I am, however, curious if this is a courtesy invitation, as the St Rose area seems to be well outside of our typical shared area of interest.

Allan Botham
Director, Infrastructure & Planning
County of Essex
360 Fairview Ave. W. Suite 315 | Essex, ON | N8M 1Y6
P: 519-776-6441 ext. 1397
F: 519-776-4455
TTY: 1-877-624-4832

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From: Jung, Chrissy <Chrissy.Jung@stantec.com>

Sent: January 28, 2022 5:03 PM
To: Allan Botham <ABotham@countyofessex.ca>
Subject: 165620239: Notice of Study Commencement - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Allan Botham,

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will involve evaluation of site selection and alternative design concepts for the proposed St. Rose Storm Water Pumping Station. A copy of the Notice of Study Commencement for the project is attached.

On behalf of the City of Windsor, 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.

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,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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APPENDIX C

Response from Review Agencies – Public Open House No. 1

planning@erca.org
P.519.776.5209
F.519.776.8688
360 Fairview Avenue West
Suite 311, Essex, ON N8M 1Y6

March 17, 2022

Chrissy Jung, M.A.Sc.,
E.I.T. Stantec Consulting Ltd.
Environmental Engineer in Training
chrissy.jung@stantec.com (by email)

Dear Chrissy Jung:

RE: ST. ROSE STORMWATER PUMPING STATION MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT PUBLIC INFORMATION CENTRE 1 – COMMENTS

It is, the ERCA understanding, that the City of Windsor, is undertaking, a *Schedule 'C' Municipal Class Environmental Assessment (Class EA)* for the proposed St. Rose Pumping Station.

This study will satisfy Phases 3 and 4 of the *Class EA* process, which will involve the evaluation of site alternatives (i.e. 4 locations) and design concept alternatives, for the proposed St. Rose Stormwater Pumping Station. An *Environmental Study Report* will be prepared to document the activities and recommendations from the *Class EA* process. The City of Windsor endorsed its first comprehensive *Sewer and Coastal Flood Protection Master Plan (SMP)* in 2020. The SMP was completed in accordance with Phases 1 and 2 of the *Municipal Class Environmental Assessment* process. It outlined that a new stormwater pumping station is required, to discharge excess water, during major storm events, in the expanded St. Rose drainage area.

The City, recently hosted, a Public Information Centre (PIC 1), on March 2, 2022, to present the evaluation of site alternatives for the St. Rose Pumping Station. This letter is in response to our receipt and review of the Public Information Centre (PIC) 1 material, for the St. Rose Stormwater Pumping Station *Municipal Class Environmental Assessment.*

Please be advised, that the study area is regulated, by the Conservation Authority, under Section 28 of the *Conservation Authorities Act*. In addition, there is very little by way of natural heritage, that, should be affected by the works proposed for the new pumping station, in the study area, except for the *Fisheries Act*, if in-water works are proposed.

The subject property may lie wholly or partially within the Event Based Area (EBA) and the Windsor's (A.H. Weeks) Drinking Water Intake Protection Zone 2 (IPZ 2) of the *Essex Region Source Protection Plan*, which came into effect October 1, 2015. The Source Protection Plan, was developed, to provide measures to protect Essex Region's municipal drinking water sources. 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 on the source water at the municipal drinking water intakes. As a result of these policies, new projects in these areas 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. Should your proposal require the installation of fuel, the application or storage of agricultural source material (ASM), the application or storage of non- agricultural source material (NASM), or the application of pesticide on the site, please contact the RMO to ensure the activity will not pose a significant risk to local sources of municipal drinking water. 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. The EBA, is delineated, using the best available mapping of drains and other open watercourses. If the proposed project, is to include the creation, relocation or removal of drains and/or other open watercourses, which would alter the delineation of the EBA, the applicant will be required to notify the Source Protection Authority. Once the project is complete and these changes are finalized, Essex Region Source Protection staff may need to adjust the delineation of the EBA. Any changes to the EBA would need to be included in formal updates to the Source Protection Plan and Assessment Report using the provisions of the Clean Water Act (s.34 or s. 36) or its Regulations (s.51). O.Reg 287/07 S. 27(3) requires municipalities to notify the SPA and SPC of proposals to engage in an activity that may result in the creation of a new transport pathway or the modification of an existing transport pathway.

When site selection, is confirmed, for the new pumping station, early consultation with the ERCA, at the detailed design stage, is encouraged, to obtain feedback on the recommended / preferred design, to ensure environmental impacts are avoided and to discuss the specific permitting requirements for this project, including other agency approvals. Please contact:

TIAN MARTIN, P.Eng.
Water Resources Engineer, Watershed Management Services
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 Essex, Ontario N8M 1Y6
P. 519-776-5209 x 304 F. 519-776-8688
tmartin@erca.org www.essexregionconservation.ca

ERCA appreciates the opportunity to provide additional comments, at a, later date. Please keep us on the mailing distribution list, for future updates, to the study, including the upcoming Public Information Centre (PIC) 2.

If you have any questions or require any additional information, to facilitate the completion of this project, please contact the undersigned.

Sincerely,

Kim Darroch

Kim Darroch, B.A., M.PL., RPP, MCIP
Team Lead, Planning Services

APPENDIX C

Response from Public – Public Open House No. 1

VIRTUAL
PUBLIC INFORMATION CENTRE
COMMENT FORM

ST. ROSE STORMWATER PUMPING STATION

To address widespread flooding issues during extreme storm events, the City completed a comprehensive study known as the Sewer & Coastal Flood Protection Master Plan (SMP). The SMP identified the need for a new stormwater pumping station and new storm sewer outlet to the Detroit River to service the St. Rose drainage area. The City is undertaking the Municipal Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will determine the location and overall design concept of the proposed pumping station for the St. Rose drainage area.

THANK YOU

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 project website below:

https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

Please return your completed comment form on or before March 17, 2022, to:

Chrissy Jung, M.A.Sc., E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 519-567-9537
chrissy.jung@stantec.com

Stantec

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

thank you for your Demo. Presentation, As stated I Think the best location is at Wyndotte street (option 4) it's the best for the area, Residents and the City. otherwise if St Rose Park selected it will destroy the area and will negatively impact the environment and the health for many generations to come. the St Rose station is against the City Bylaws & against ERCA conservation & Environment Canada Recommendations & Bylaws in conserving and Protecting natural areas & green spaces - (objectives) especially preserving green spaces in areas deficient of such. the Damage will last generations. The cost For (option 4) is arbitrary and due diligence with obtaining other offering from other companies Not considered thus We Reject (St. Rose Park) location. Our opinion & All Residents in the area should be respected + the city is able to consider more fund

NAME

EMAIL ADDRESS

TELEPHONE NO. ( ) [redacted]

[redacted]

DATE 4/3/22. SIGNATURE [redacted]

Personal information submitted is collected, maintained, and disclo[redacted] 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.

[redacted]

Stantec

Office of the Commissioner of Infrastructure Services

June 16, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre held on March 2nd, 2022. This letter is in response to your comment form which was received by email on March 7th, 2022.

Comment No. 1: Alternative No. 4 (Wyandotte Street) is the best location for the area, residents, and the City.

Following a detailed evaluation of the four site locations, *Alternative No. 1 (St. Rose Beach Park)* was identified as the preferred location based on a balance of evaluation criteria. Benefits of the St. Rose Beach Park location include the ability to meet flood mitigation objectives while mitigating undesirable social, economic, and natural environmental impacts. This location does not require displacement of existing residents or businesses and has the most flexibility to adjust to climate change, with room for potential expansion to meet future needs. Construction at this location will be less complicated, it will require less maintenance and have lower operational costs. The disruption to the nearby residents and community during construction will also be the least impactful.

The existing storm sewer system was constructed with storm runoff flowing toward the existing outlet at St. Rose Beach Park. Alternative No. 1 maintains this natural flow of water which provides technical advantages for the implementation and operation of the pumping station and the ability to utilize existing stormwater infrastructure. Alternative No. 4 (Wyandotte Street) would require additional engineering solutions to direct water away from the river which results in a complicated, invasive, and costly stormwater pumping station and storm sewer network.

For more information on the site evaluation carried out under this phase of the Municipal Class Environmental Assessment can be found on the project website in Stantec Consulting Ltd.'s (Stantec) technical memorandum entitled 'Comparative Evaluation of Site Location' at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx].

Comment No. 2: Alternative No. 1 (St. Rose Beach Park) will negatively impact the environment and health for many generations to come.

The proposed pumping station will be designed to mitigate risk to the natural environment. It is important to consider the current condition of all four sites. All locations are in a residential area with landscaped properties which have low ecological diversity, and do not support strong terrestrial ecosystems. The four sites are largely covered with landscaping, grass, structures, or concrete surfaces. At St. Rose Beach Park, the design of the stormwater pumping station will include landscaping features and a diverse range of native plants to improve the existing natural environment and terrestrial habitats.

The proposed pumping station will be designed in accordance with applicable Codes, Standards, and regulatory agencies. Emergency power generators are to be equipped with sound attenuation and emission control. The St. Rose Beach Park site provides the greatest distance and degree of separation of the storm pumping infrastructure from residential properties.

Comment No. 3: Alternative No. 1 (St. Rose Beach Park) is against City bylaws, ERCA and Environment Canada recommendations, and bylaws in conserving and protecting natural areas and green spaces (Objective 6) especially preserving greenspaces in areas deficient of such.

The detailed evaluation of the four site alternatives took into consideration development by-laws and policies from applicable municipal and governmental agencies. As part of the Municipal Class Environmental Assessment process, this study will be shared with City Council, Essex Regional Conservation Authority (ERCA), Ontario Ministry of Environment, Conservation and Parks (MECP), Ontario Ministry of Heritage, Sport, Tourism and Cultural Industries (MHSTC), and other regulatory agencies.

In addition, this stormwater pumping station is proposed in accordance with the City of Windsor's Environmental Master Plan (2017) Goal B 'Improve Water Quality' Objective B2 'Improve Stormwater Management to Reduce the Risk of Flooding to Residents'. Through this project, the City of Windsor will incorporate social, architectural, and landscaping features to improve the aesthetics of the facility allowing the community to enjoy physical activity, picnics, fishing, and other recreational activities in the space.

Comment No. 4: The cost provided for Alternative No. 4 is arbitrary and due diligence with obtaining offerings from other companies was not considered.

Please be advised the storm sewer system has been constructed with storm runoff flowing toward the existing outlet at St. Rose Beach Park. When compared to Alternative No. 1, the implementation of Alternative No. 4 would require a complicated and very costly stormwater pumping station and associated infrastructure. Aside from requiring multiple property acquisitions, additional storm sewers would be required to redirect flow to the Alternative No. 4 site and existing utilities would require relocating; therefore, the estimated costs for the buildout of Alternative No. 4 are the highest.

More information on the financial analysis and site evaluation carried out under this phase of the Municipal Class Environmental Assessment can be found on the project website in Stantec Consulting Ltd.'s (Stantec) technical memorandum entitled 'Comparative Evaluation of Site Location' at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx].

A second PIC is scheduled for Thursday June 23, 2022. A notice was sent June 10th to all interested residents and stakeholders to participate at this upcoming event to provide feedback on the alternative design options presented for the preferred location. The upcoming PIC will focus on the various design concepts for the proposed pumping station at the St. Rose Beach Park.

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

Cc: J. Coombs

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

Pleased with the location of station – underground pumps are a plus
Buildings look too utilitarian – can they be softened in appearance?

NAME [redacted]

EMAIL ADDRESS

TELEPHONE NO. [redacted]

DATE ~~Feb~~ Mar 11/22 SIGNATURE [redacted]

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.

THE CITY OF WINDSOR ONTARIO, CANADA

Office of the Commissioner of Infrastructure Services

June 16, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre (PIC) held on March 2nd, 2022. This letter is in response to your comment form which was received by mail on March 16th, 2022.

We are pleased to hear you are satisfied with the proposed location of the pumping station and consider the design concept of underground pumps favourable. Below is our response to your comment regarding the proposed appearance of the pumping station.

Comment: Buildings look too utilitarian – Can they be softened in appearance?

The three-dimensional (3D) renderings presented during the PIC represent a preliminary proposal for the architectural design of the onsite electrical building. Your comments regarding the utilitarian appearance of the building have been noted as part of this environmental assessment study and will be considered during the detailed design phase of the proposed pumping station and associated infrastructure. In the final design phase, the architectural design will soften the appearance of the proposed building and ensure it is suitable for the area. The character of the neighbourhood will be considered in the design of landscaping, building architecture, and amenities.

A second PIC is scheduled for Thursday June 23, 2022. A notice was sent June 10th to all interested residents and stakeholders to participate at this upcoming event to provide feedback on the alternative design options presented for the preferred location. The upcoming PIC will focus on the various design concepts for the proposed pumping station at the St. Rose Beach Park.

Sincerely,

C. Nepszy

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

IRTUAL
PULIC INFORMATION CENTRE
COMMENT FORM

ST. ROSE STORMWATER PUMPING STATION

To address widespread flooding issues during extreme storm events, the City completed a comprehensive study known as the Sewer & Coastal Flood Protection Master Plan (SMP). The SMP identified the need for a new stormwater pumping station and new storm sewer outlet to the Detroit River to service the St. Rose drainage area. The City is undertaking the Municipal Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will determine the location and overall design concept of the proposed pumping station for the St. Rose drainage area.

THAN OU

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 project website below:

https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

Please return your completed comment form on or before March 17, 2022, to:

Chrissy Jung, M.A.Sc., E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 519-567-9537
chrissy.jungstantec.com

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

To City of Windsor Regarding St Rose Pumping Station.

It is without a doubt that the Upgrade to St Rose's Gravity Drain is a MUST to avoid future flooding. With recent events of heavy rains, the current system does not provide the services required to manage our current needs and future rainfalls.

There is no better choice than Proposal #1 location, located at St Rose Beach Park. All other alternatives are costly and in effective for the primary purpose of discharging water. The proposal #1 does provide enough "Curb Appeal" to the scenic route of Riverside Dr, no difference than other functioning structures along Riverside Dr. (i.e., St Paul Pumping Station). Furthermore, it would be foolish for the city to expropriate residences from their current dwelling for this purpose.

The proposed structures are not intrusive and could also be further enhanced with some architectural and landscaping features to enhance the pumping station structure. Soften the look and that provides a more welcoming look to the park is the goal for all. Suggested ideas are, a) Building Material – Limestone House look like several houses in the area, b) Residential look with false windows and doors c) Rose Gardens to symbolize the Park and the City emblem. d) Generator to be Exhausted into the Water like a boat to reduce the noise and pollution

There is no better time to act now to control the price and to mitigate the potential for more flooding in the future.

Your Truly.

[redacted]

NAME [redacted]

EMAIL ADDRESS [redacted]

TELEPHONE NO. ([redacted]

DATE 3/11/2022 SIGNATURE [redacted]

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.

Office of the Commissioner of Infrastructure Services

June 16, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre (PIC) held on March 2nd, 2022. This letter is in response to your comment form received by email on March 12th, 2022.

We are pleased to hear you are satisfied with the proposed stormwater pumping station and consider St. Rose Beach Park a favourable location. Below is our response to your comment regarding the proposed architectural and landscaping features for the St. Rose Stormwater Pumping Station.

Comment: The proposed structures are not intrusive and could also be further enhanced with some architectural and landscaping features to enhance the pumping station structure.

The three-dimensional (3D) renderings presented during the PIC represent a preliminary proposal for the architectural design of the onsite structures and landscaping at St. Rose Beach Park. Your comments regarding proposed building materials, residential architectural features, landscaping features, and the generator building have been noted as part of this environmental assessment study and will be considered during the detailed design stage of the proposed pumping station and associated infrastructure. As a result, the landscaping and architectural design is to be optimized to soften the appearance of the proposed buildings and ensure it is suitable for the area. The character of the neighbourhood will be considered in the design of landscaping, building architecture, and amenities.

A second PIC is scheduled for Thursday June 23, 2022. A notice was sent June 10th to all interested residents and stakeholders to participate at this upcoming event to provide feedback on the alternative design options presented for the preferred location. The upcoming PIC will focus on the various design concepts for the proposed pumping station at the St. Rose Beach Park.

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

Cc: J Coombs

VIRTUAL
PUBLIC INFORMATION CENTRE
COMMENT FORM

ST. ROSE STORMWATER PUMPING STATION

To address widespread flooding issues during extreme storm events, the City completed a comprehensive study known as the Sewer & Coastal Flood Protection Master Plan (SMP). The SMP identified the need for a new stormwater pumping station and new storm sewer outlet to the Detroit River to service the St. Rose drainage area. The City is undertaking the Municipal Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. This Class EA will determine the location and overall design concept of the proposed pumping station for the St. Rose drainage area.

THANK YOU

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 project website below:

https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx

Please return your completed comment form on or before March 17, 2022, to:

*

Chrissy Jung, M.A.Sc., E.I.T.
Stantec Consulting Ltd.
Environmental Engineer in Training
Mobile: 519-567-9537
chrissy.jung@stantec.com

cc – [redacted]

Stantec

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

#1 • Totally Support A Pump Being installed @ St. Rose Park Alternative #1: Support All Benefits Listed

OPPOSE
• oppose option 2, 3, & 4, Pump too Far From Ejection Point, city Have to Buy Property At increased Cost and Negotiation Delay, All Need Larger Pump to Meet Distance, unknown IF Houses + Businesses For Sale.

• Preserve Natural Beauty As #1

• Possible to move Power Generator to Wyandotte Park & Connect By Cable So No Building to Obstruct Scenic Drive, Could Be Suggestion to improve #1

NAME [redacted]

EMAIL ADDRESS [redacted]

TELEPHONE NO. ([redacted]

DATE March 2/2022 SIGNATURE [redacted]

Stantec

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*[redacted]

#[redacted] ALSO Support ABOVE.

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

#1 Support See Notes

[redacted] Agree Fully

[redacted] [redacted]

Support #1

NAME [redacted] [redacted]

EMAIL ADDRESS [redacted]

TELEPHONE NO. ([redacted]

DATE March 2/2022 SIGNATURE [redacted]

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.

Note [redacted]

Office of the Commissioner of Infrastructure Services

June 16, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre held on March 2nd, 2022. This letter is in response to your comment form received by email on March 7th, 2022.

We are pleased to hear you are in favour of the proposed pumping station location. Please see the response to your inquiry regarding the location of the above-ground buildings required for the proposed pumping station.

Comment: Is it possible to move the electrical building and generator to the park (at the intersection of Wyandotte Street / St. Rose Avenue) and connect by cable such that no building obstructs the view in the St. Rose Park?

We have evaluated the feasibility of moving the electrical building and generator offsite. Unfortunately, it is not considered a viable option to locate the electrical building and/or generator offsite due to operational and safety requirements and standards. Various design concepts and site layouts will be considered in an effort to minimize the impact to the waterfront view.

A second PIC is scheduled for Thursday June 23, 2022. A notice was sent June 10th to all interested residents and stakeholders to participate at this upcoming event to provide feedback on the alternative design options presented for the preferred location. The upcoming PIC will focus on the various design concepts for the proposed pumping station at the St. Rose Beach Park.

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

Cc: J Coombs

From: [redacted]
To: Jung, Chrissy
Cc: [redacted]
Subject: Input for Class EA for St Rose Pumping Station
Date: Friday, January 28, 2022 8:16:41 PM

Chrissy,

We received your letter inviting participation and input to the Class EA for the St Rose Pumping Station project. I am happy to participate and to provide input, including some initial input below, and going forward. [redacted].

Some initial input:

1. Our highest priority is that the design of the pumping station and the associated effluent pipes be designed so that it does cause unhealthy or smelly water to be discharged in a way that it will accumulate in the little bay at St Rose Beach Park or flow right along the shoreline. It should discharge far enough out into the flow of the Detroit River so it gets diluted and mixes quickly. Perhaps a dye test could be conducted to demonstrate the flow pattern from the location planned for the water to be discharged into the river. We've noted that the dirty flow from Little River sometimes creates a smelly brown plume that fails to mix in the Pesche Island Channel, and we don't want to recreate that at St Rose.
2. Second highest priority for us is that the pumping station building is designed to fit into the character of the park and the neighborhood. The wall treatment at the Manning pumping station is an example of high quality materials that are respectful of the residential character of the neighborhood. However, in that design, the building height is quite high, which makes it resemble a residential structure but it does not respect the character of the park. The ideal design would include putting as much as possible under the ground level, so as to keep the height low, which also would help preserve the views of the river and the park by residents to the East and South of the pumping station.
3. Third highest priority for us is that the pumping station be built so that it is not noisy when the pump or generators are operating.
4. Fourth priority is for the lighting to be downcast with light fixtures appropriate for a residential area. We don't want big security lights shining into the windows of houses.
5. Finally, it would be ideal if the pumping station project included benefits to the users of the park. Presumably the project will involve rebuilding the sea wall and perhaps adding a service driveway, so it would be nice if the project could include a ramp designed for launching kayaks and canoes (vessels without motors), which are increasing in popularity along the river. The current banks of St Rose Beach have large rocks, making launch difficult. Other amenities, such as a drinking water fountain, could be incorporated into the design as a benefit to park users.

Thank you for the opportunity to provide this input. Feel free to call if we can be helpful in the EA project.

Sincerely,
-- [redacted]

[redacted]

Office of the Commissioner of Infrastructure Services

June 16, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Notice of Commencement sent by mail on January 28th, 2022. This letter is in response to your comments received by email on January 28th, 2022. Below is our response to your initial input regarding the St. Rose Stormwater Pumping Station Environmental Assessment project.

Comment No. 1: Our highest priority is that the design of the pumping station and the associated effluent pipes be designed so that it does [not] cause unhealthy or smelly water to be discharged in a way that it will accumulate in the little bay at St Rose Beach Park or flow right along the shoreline.

The proposed pumping station is only for stormwater servicing. It is not anticipated that raw sewage will be collected and enter this storm sewer system. Please note, as part of the Municipal Class Environmental Assessment process, this study will be reviewed by the Ontario Ministry of Environment, Conservation and Parks (MECP).

Comment No. 2: Second highest priority for us is that the pumping station building is designed to fit into the character of the park and the neighborhood.

The three-dimensional (3D) renderings presented during the PIC represent a preliminary proposal for the landscaping of the proposed St. Rose Beach Park site and architectural design of onsite buildings. Your comments regarding the desired architecture of the building will be noted in this environmental assessment study and will be considered during the detailed design of the pumping station. The architectural design of the buildings will be optimized to soften the appearance of the building and ensure it is suitable for the area. The character of the park and the neighbourhood will be considered in the design of landscaping, building architecture, and amenities.

Comment No. 3: Third highest priority for us is that the pumping station be built so that it is not noisy when the pump or generators are operating.

The proposed pumping station and generators will be designed in accordance with the Ontario Ministry of Environment, Conservation and Parks (MECP) Environmental Noise Guidelines. The MECP has stringent sound attenuation requirements. This will ensure the appropriate engineering control measures are in place and minimize noise emissions to the surrounding neighbourhood.

Comment No. 4: Fourth priority is for the lighting to be downcast with light fixtures appropriate for a residential area.

The light fixtures at the proposed pumping station are to be designed appropriately for a residential area.

Comment No. 5: Finally, it would be ideal if the pumping station project included benefits to the users of the park.

Your comments regarding the desired park amenities have been noted in this environmental assessment study and will be taken into consideration during the detailed design phase of the proposed pumping station.

A second PIC is scheduled for Thursday June 23, 2022. A notice was sent June 10th to all interested residents and stakeholders to participate at this upcoming event to provide feedback on the alternative design options presented for the preferred location. The upcoming PIC will focus on the various design concepts for the proposed pumping station at the St. Rose Beach Park.

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

Cc: J. Coombs

St. Rose Stormwater Pumping Station
Municipal Class Environmental Assessment
Public Information Centre- Comment Form

[redacted]

To Whom it May Concern,

Thank you for sharing your analysis of the alternative sites considered for the St. Rose pumping station. Selecting the park is economically the cheapest alternative, however I believe the natural environmental and social impacts are much greater than your study concluded. At the open house, I was told repeatedly that this site had the least negative impact on the neighborhood. I disagree with this conclusion. Over 2,600 people have signed a petition (change.org St.Rose) to save the park. The park is utilized by thousands of people throughout the year, by neighbors and people arriving by car. People come to play and picnic in the park, fish, and sit on the benches to relax and enjoy the tranquility of the river in a natural setting.

I believe there has been a grave error in the study's conclusions of minimal impacts to the natural environment, is a "better use" of existing infrastructure, and social impacts of "some" disruption to waterfront parkland. I will discuss my findings which make the site location in alternative 1 a poor environmental choice. Further, I would like to request more detailed information on the cost estimate of alternative 4, so a financial analysis of an amortized cost comparison to what the park is worth can be reviewed.

The Detroit River Canadian Cleanup has spent decades on a massive conservation effort to clean up the Detroit River. St. Rose Beach Park was part of the stage 2 of the Remedial Action Plan (1998-2008). The St. Rose Beach Park Naturalization Habitat Enhancement Project was completed in 2001. The project was led by the City of Windsor, Essex Region Conservation Authority and partnered with Environment Canada ($283,000). The project was funded due to a loss of fish and wildlife habitat. The goal was to improve the long term stability of the shoreline in the City of Windsor. (www.windsorstar.com/pdf/1detroitriver.pdf) p. 99.

As of 9/23/20, Detroit River Canadian Cleanup rated the conditions at St. Rose as "impaired". On 10/16/20, the Detroit River Habitat Projects Remedial Action Plan listed 13 shoreline softening projects. St. Rose is one of the sites on the Detroit Upper Riverfront Parks Restoration. St. Rose is one of the few remaining natural embayments along the Upper Detroit Shoreline. ERCA's objective is to "protect the critical nature of watercourses and shoreline". ERCA recommends city planning to coordinate with the Detroit River Cleanup (RAP).

The St. Rose Park site is inconsistent with the City of Windsor's Environmental Plan (2017), Objective B4: Improve the Health of the Detroit River and Great Lakes Waters. Actions: (1) Work to protect and preserve **all** remaining natural shorelines, and (2) support the bi-national RAP and partner with Detroit River Canadian Cleanup (p19).

I disagree with the study's finding that placing the pumping station in St. Rose Park is a better use of existing infrastructure, because it assumes green space is an inferior use and infrastructure. According to the City of Windsor's Environmental Plan (2017) Goal C-Responsible Land Use, Objective C6: Acquire or transition additional lands for integration into our parks, natural areas, and natural heritage system, Actions: Seek out opportunities to increase and protect parkland, natural spaces. Objective C7 is to protect, enhance and expand the quality and coordination of our natural heritage system (p.25). The plan emphasizes both psychological and economic benefits of green space.

The St. Rose site is also inconsistent with the Provincial Policy Statement (2020). The introduction to the statement reads: "Municipal official plans are the most important vehicle for implementation of this Provincial Policy Statement and for achieving comprehensive, integrated and long-term planning. Official plans shall identify provincial interests and set out appropriate land use designations and policies (p.1). The following are quotes from the policy statement:

1.5.1- Provide opportunities for public access to shorelines- healthy, active communities- planning and providing an equitable distribution of publicly accessible natural settings and minimize negative impacts on those areas. (p.17).

1.6.2- Planning should promote **green** infrastructure to compliment infrastructure (p.17).

1.6.6.1- Sewage and water services shall…protect the natural environment (p.18).

1.7.1- Consideration ecological benefits provided by nature (p.22).

2.1.6, 2.1.7, 3.12- Development and site alteration shall not be permitted in: fish habitat, endangered species, defined portions of the flooding hazard along connecting channels including Detroit River (p.24).

The Detroit River at St. Rose Park is frequently home to visiting bald eagles who come to play and eat the fish. Many people in the community come to fish on a daily basis.

Ontario's Environmental Plan (2018) states, "We know that climate change poses a serious threat to Ontario's natural areas and conservation of these areas can play an important role in mitigating and adapting to climate change. We will protect and enhance our natural areas, support conservation efforts, …and promote the importance of healthy **natural spaces** for future generations to use and enjoy" (p.46).

The study's recommendation is a major social disruption because of the literal takeover of the green space of the parkland. As was mentioned earlier, over 2600 people have signed a petition to not allow use of St. Rose park as a pumping station site. St. Rose Park is not only a community treasure, but is also a global treasure, because it is an integral part of the Great Lakes system which contains 20% of the world's fresh water. We can make a better decision than placing the pumping station on this site. I believe we can find a better solution than using an environmental asset, such as St. Rose Park, to solve an environmental issue. Thank you for your consideration of the above issues.

Sincerely,

[redacted]

June 16, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre held on March 2nd, 2022. This letter is in response to your comment form which was received by email on March 25th, 2022.

Comment No. 1: Selecting the park is economically the cheapest alternative, however I believe the natural environmental and social impacts are much greater than your study concluded. At the open house, I was told repeatedly that this site had the least negative impact on the neighborhood. I disagree with this conclusion. Over 2,600 people have signed a petition (change.org St. Rose) to save the park. The park is utilized by thousands of people throughout the year, by neighbors and people arriving by car. People come to play and picnic in the park, fish, and sit on the benches to relax and enjoy the tranquility of the river in a natural setting.

Following a detailed evaluation of the four site locations, *Alternative No. 1 (St. Rose Beach Park)* was identified as the preferred location based on a balance of evaluation criteria. Benefits of the St. Rose Beach Park location include the ability to meet flood mitigation objectives while mitigating undesirable social, economic, and natural environmental impacts. This location does not require displacement of existing residents or businesses and has the most flexibility to adjust to climate change, with room for potential expansion to meet future needs. Construction at this location will be less complicated, it will require less maintenance and have lower operational costs. The disruption to the nearby residents and community during construction will also be the least impactful.

The existing storm sewer system was constructed with storm runoff flowing toward the existing outlet at St. Rose Beach Park. Alternative No. 1 maintains this natural flow of water which provides technical advantages for the implementation and operation of the pumping station and the ability to utilize existing stormwater infrastructure. With the implementation of the proposed infrastructure, the park would remain open to the public and would have more landscaping features and additional park amenities allowing the community to continue to enjoy recreational activities.

For more information on the site evaluation carried out under this phase of the Municipal Class Environmental Assessment can be found on the project website in Stantec Consulting Ltd.'s (Stantec) technical memorandum entitled 'Comparative Evaluation of Site Location' at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx].

Comment No. 2: I believe there has been a grave error in the study's conclusions of minimal impacts to the natural environment, is a "better use" of existing infrastructure, and social impacts of "some" disruption to waterfront parkland. I will discuss my findings which make the site location in alternative 1 a poor environmental choice.

The proposed pumping station will be designed to mitigate risk to the ecological and natural systems that exist on site. Although there is no structure on the site at the park, there is currently low ecological diversity and low plant diversity. In considering the other sites, alternatives 2, 3, and 4 currently have houses or commercial buildings with landscaped properties and low ecological diversity. These sites are largely covered with landscaping, grass, structures, or concrete surfaces. The design of the proposed stormwater pumping station will include additional landscaping features and a diverse range of native plants to improve the existing natural environment and support terrestrial habitats.

The existing storm sewer system was constructed with storm runoff flowing toward the existing outlet at St. Rose Beach Park. Alternative 1 maintains this natural flow of water and will utilize the existing stormwater collection system infrastructure. If the proposed pumping station is not located near the existing outlet, additional sewers will need to be constructed upstream and downstream to collect and convey stormwater between the outlet location and the pumping station. The farther the pumping station is located from the outlet the more infrastructure is required to be built.

Comment No. 3: I would like to request more detailed information on the cost estimate of alternative 4, so a financial analysis of an amortized cost comparison to what the park is worth can be reviewed.

The high level financial analysis was provided during the March PIC. Please refer to the PIC slides on the City's website at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx]. Additionally, the high level financial analysis can be found on the project website in Stantec's technical memorandum entitled 'Comparative Evaluation of Site Location' at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx].

Comment No. 4: The Detroit River Canadian Cleanup has spent decades on a massive conservation effort to clean up the Detroit River. St. Rose Beach Park was part of the stage 2 of the Remedial Action Plan (1998-2008). The St. Rose Beach Park Naturalization Habitat Enhancement Project was completed in 2001. The project was led by the City of Windsor, Essex Region Conservation Authority and partnered with Environment Canada ($283,000). The project was funded due to a loss of fish and wildlife habitat. The goal was to improve the long term stability of the shoreline in the City of Windsor. (www.windsorstar.com/pdf/1detroitriver.pdf) p. 99.

As of 9/23/20, Detroit River Canadian Cleanup rated the conditions at St. Rose as "impaired". On 10/16/20, the Detroit River Habitat Projects Remedial Action Plan listed 13 shoreline softening projects. St. Rose is one of the sites on the Detroit Upper Riverfront Parks Restoration. St. Rose is one of the few remaining natural embayments along the Upper Detroit Shoreline. ERCA's objective is to "protect the critical nature of watercourses and shoreline". ERCA recommends city planning to coordinate with the Detroit River Cleanup (RAP).

The St. Rose Park site is inconsistent with the City of Windsor's Environmental Plan (2017), Objective B4: Improve the Health of the Detroit River and Great Lakes Waters. Actions: (1) Work to protect and preserve all remaining natural shorelines, and (2) support the bi-national RAP and partner with Detroit River Canadian Cleanup (p19).

The proposed pumping station will not impact the naturalized embayment on the western section of St. Rose Beach Park or the health of the Detroit River and Great Lakes. The proposed pumping station will be designed with an appropriate gravity outlet structure to mitigate impacts to the long-term stability of the shoreline of the Detroit River. Please note, as part of the Municipal Class Environmental Assessment process, this study will be shared with Windsor City Council, Essex Regional Conservation Authority (ERCA), Detroit River Canadian Cleanup, Ontario Ministry of Environment, Conservation and Parks (MECP), Ontario Ministry of Heritage, Sport, Tourism and Cultural Industries (MHSTC), and other regulatory agencies.

Comment No. 5: I disagree with the study's finding that placing the pumping station in St. Rose Park is a better use of existing infrastructure, because it assumes green space is an inferior use and infrastructure. According to the City of Windsor's Environmental Plan (2017) Goal C- Responsible Land Use, Objective C6: Acquire or transition additional lands for integration into our parks, natural areas, and natural heritage system, Actions: Seek out opportunities to increase and protect parkland, natural spaces. Objective C7 is to protect, enhance and expand the quality and coordination of our natural heritage system (p.25). The plan emphasizes both psychological and economic benefits of green space.

Please see the response to Comment No. 2 regarding the better use of existing infrastructure.

The proposed pumping station is an important part of a City-wide solution to widespread flooding concerns and is necessary to protect residents from extreme weather events. Impacts to the waterfront park will be mitigated by designing the pumping station in a way that minimizes disruption to waterfront views and allows for a majority of the park to remain available for the community to use. Incorporating social, architectural, and landscaping features in the park will be considered during the detailed design phase to allow the community to enjoy recreational activities in the space.

Comment No. 6: The St. Rose site is also inconsistent with the Provincial Policy Statement (2020). The introduction to the statement reads: "Municipal official plans are the most important vehicle for implementation of this Provincial Policy Statement and for achieving comprehensive, integrated and long-term planning. Official plans shall identify provincial interests and set out appropriate land use designations and policies (p.1). The following are quotes from the policy statement:

1.5.1- Provide opportunities for public access to shorelines- healthy, active communities-planning and providing an equitable distribution of publicly accessible natural settings and minimize negative impacts on those areas. (p.17).
1.6.2- Planning should promote green infrastructure to compliment infrastructure (p.17).
1.6.6.1- Sewage and water services shall…protect the natural environment (p.18).
1.7.1- Consideration ecological benefits provided by nature (p.22).
2.1.6, 2.1.7, 3.12- Development and site alteration shall not be permitted in: fish habitat, endangered species, defined portions of the flooding hazard along connecting channels including Detroit River (p.24).

The detailed site evaluation took into consideration development policies and agreements from applicable local and governmental agencies including the Ontario Provincial Policy Statement.

The proposed site (St. Rose Beach Park) is consistent with *Policy 1.5.1* as the public will continue to have access to the shoreline along the entirety of St. Rose Beach Park which will promote healthy and active communities. The proposed facility and open space will be safe, meet the needs of pedestrians, and foster social interaction. Further, a majority of the park will remain available to the public ensuring equitable distribution of publicly accessible built and natural settings for recreation.

Policy 1.5.1 Item (d) recognizing provincial parks, conservation reserves, and other protected areas, and minimizing negative impacts on these areas, is not applicable to St. Rose Beach Park.

The design of the proposed pumping station will be consistent with *Policy 1.6.2, planning authorities should promote green infrastructure to complement infrastructure.* Permeable pavement, green roof, and rain gardens are examples of green infrastructure that may be utilized to complement the pumping station design.

The design of the proposed pumping station will be consistent with *Policy 1.6.6.1 Item (b) ensure that these systems are provided in a manner that (4) protects human health and safety, and the natural environment*. The proposed pumping station will be designed to mitigate risk to the natural environment, human health and safety through compliance with municipal and governmental design standards.

Alternative No. 1 (St. Rose Beach Park) is consistent with *Policy 1.7.1 Item (k) minimize negative impact from climate change and consider the ecological benefits provided by nature*. One major impact of climate change is flooding. The proposed pumping station is one step in the City of Windsor's commitment to minimize negative impacts from climate change through improving stormwater management to reduce the risk of flooding to residents. The design of the proposed pumping station will consider the ecological benefits through the addition of landscaping features and plant diversity to improve the existing natural environment and support terrestrial habitats.

Alternative No. 1 (St. Rose Beach Park) is consistent with *Policies 2.1.6*, *2.1.7*, and *3.1.2 Item (b)* as the proposed pumping station would not be located in fish habitat (*Policy 2.1.7*), habitat of endangered or threatened species (*Policy 2.1.7*) or in the defined portion of the flooding hazard along the Detroit River (*Policy 3.1.2 Item (b)*).

Comment No. 7: The Detroit River at St. Rose Park is frequently home to visiting bald eagles who come to play and eat the fish. Many people in the community come to fish on a daily basis.

The proposed pumping station will be designed and constructed according to municipal and provincial design standards and mitigate impacts to fish habitat to allow for fishing to continue in the park.

Comment No. 8: Ontario's Environmental Plan (2018) states, "We know that climate change poses a serious threat to Ontario's natural areas and conservation of these areas can play an important role in mitigating and adapting to climate change. We will protect and enhance our natural areas, support conservation efforts…and promote the importance of healthy natural spaces for future generations to use and enjoy" (p.46).

The Ontario Environmental Plan identifies as part of the action plan that environmental planning is key to protecting people and property from flooding due to the changes in climate. The proposed pumping station is an important part of the solution to a City-wide flooding issue and is necessary to protect property and residents from extreme weather events.

A second PIC is scheduled for Thursday June 23, 2022. A notice was sent June 10th to all interested residents and stakeholders to participate at this upcoming event to provide feedback on the alternative design options presented for the preferred location. The upcoming PIC will focus on the various design concepts for the proposed pumping station at the St. Rose Beach Park.

Sincerely,

C. Nepszy

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

Cc: J. Coombs

MANNING
ENVIRONMENTAL LAW

DELIVERED BY EMAIL

March 25, 2022

Janelle Coombs, P. Eng. Projet Administrator, City of Windsor 350 City Hall Square West, Suite 310, Windsor, Ontario, N9A 6S1 Email: *jcoombs@citywindsor.ca*	Jian Li, Ph.D., P. Eng. Project Manager Stantec Consulting Ltd. 2555, Ouelette Avenue, Suite 100 Windsor, ON N8X 1L9 Email: *jian.li@stantec.com*

Dear Ms. Coombs andd M. Li,

RE: City of Windsor St. Rose Stormwater Pumping Station
Municpal Class Environmental Assessment ("MCEA") – Phases 3 and 4

We are environmental legal counsel for [redacted].

We write in response to your recent commencement of Phases 3 and 4 of the Class C MCEA of the proposed St. Rose Stormwater Pumping Station.

Background

On January 25, 2021 we wrote to the City with [redacted] submission ("[redacted] Submission") reponding to the City's Notice of Completion of the Municipal Class Assessment of its Coastal Flood Protection Master Plan. We attach a copy of that letter for ease of reference.

In brief, [redacted] objected to the choice of St. Rose Ave. Park greenspace as the preferred location for a new "Rose Park" pumping station ("Rose Park Pumping Station") and suggested that another option considered by the City, at the northwest corner of the St. Rose Ave./Wyandotte St. East intersection was the better and preferable choice.

On December 12, 2020, you wrote to us advising that the project had been evaluated as a Schedule C Environmental Assessment ("EA") under the MCEA, which would require additional consultation, investigation, and public review, to fulfill Phases 3 and 4 of the MCEA.

You have had some correspondence with [redacted] in February 2022 in which you confirmed that you have added him to the study mailing list.

We also understand that you held a public information session in March 2022, which [redacted] was unable to attend. [redacted] has passed to us a copy of your presentation given at that session ("Presentation"), a copy of which we attach to this letter, again for ease of reference.

Please would you ensure that our interest as [redacted] counsel is noted and that we are also added to the mailing list?

Discussion

As noted in the [redacted] Submission, the preferred "solution" for this project, is construction of a new pumping station. This should not be confused with, "preferred location" of that pumping station.

The preferred solution was part of Phase 2 of the MCEA but the preferred location still has to be studied and consulted upon under Phase 3.

We were pleased to see this acknowledged in the Presentation where it says:

> *Phase 3 of the Class EA process for this study will include:*
>
> - *Review of alternative locations for the St. Rose stormwater pumping station*
> - *Identify the preferred location*

We were concerned however to see the Presentation goes on to include a slide identifying the St. Rose Beach Park Alternative as the "Preferred Site Locat[redacted]'. [redacted]

This presumes the outcome of the Phase 3 exercise at its outset, which is premature and therefore flawed.

Requests for Information.

Please would you provide a link to any evaluation studies carried out <u>as part of the Phase 3 of the MCEA.</u> We have been unable to find any mention of such studies on the City's project website.

Without limiting that request, please would you provide the following information:

- **Cost Comparison of Site Alternatives** – please supply data showing the relative cost of the Wyandotte site compared with the St. Rose Park site, e.g. expropriation costs, additional infrastructure requirements etc.

- **Environmental** – please provide any environmental study that was submitted to the City comparing the site alternatives.
- **Site Design** – please clarify why the design shown in the concept drawing has now been down graded to a cinderblock building.

Objection and Proposal

In the meantime, [redacted] strongly objects to the selection of Alternative 1: St. Rose Beach Park as the "preferred location" as premature and, for the reasons set out in the [redacted] Submission, on the merits. [redacted] proposes Alternative 4: the St. Rose Ave./Wyandotte St. East intersection as the better and preferable choice.

Yours sincerely,

[redacted]

[redacted] [redacted]

MANNING
ENVIRONMENTAL LAW

DELIVERED BY EMAIL

January 25, 2021

Anna M. Godo, P. Eng. Senior Engineer, City of Windsor 350 City Hall Square West, 3rd Floor, Windsor, Ontario, N9A 6S1 Email: *agodo@citywindsor.ca*	Flavio Forest, P.Eng, Project Manager, Dillon Consulting Ltd. 3200 Deziel Drive, Suite 608 Windsor, ON N8W 5K8 Email: *fforest@dillon.ca*

Dear Ms. Godo andd Mr. Forest,

RE: City of Windsor Sewer and Coastal Flood Protection Master Plan
Submission of [redacted] Pursuant to Notice of Completion

We are environmental legal counsel for [redacted], who owns and and lives a[redacted].

Introduction

The City of Windsor issued a Notice of Completion dated [redacted] and Coastal Flood Protection Master Plan. That Notice invite[redacted]rom interested persons by January 25, 2021 and this letter resp[redacted]

Briefly stated, [redacted] supports the City's endeavour [redacted]ds it on bringing the Master Plan to this point.

However, [redacted] objects strongly to the present proposal to choose St. Rose Ave. Park greenspace as the preferred location for a new "Rose Park" pumping station (Rose Park Pumping Station) when the Master Plan Report[1] acknowledges that, among the available options, this will result in the greatest permanent adverse change to the local urban community.

The City has failed, up to this point, to give sufficient weight to the adverse effects of selecting St. Rose Ave. Park as the preferrred location and also to the relative merits of alternative locations. In short, the City should choose one of the other three locations considered for the Rose Park Pumping Station in the Master Plan Report, namely Alternative 4 discussed below.

[1] City of Windsor Sewer and Coastal Flood Protection Master Plan Report Project No. 17-6638 November 2020

The Exchange Tower
130 King Street West Suite 1800
Toronto, Ontario, M5X 1E3

Tel: 416.640.6422
Fax: 416.640.6421
www.manningenvironmentallaw.com

Alternative 4 is a better location for the Rose Park Pumping Station

The Master Plan Report identifies[2] four (4) viable pumping station location alternatives were evaluated as described below:

- Alternative 1 – Construct the St. Rose Ave. Pumping Station in the St. Rose Ave. Park greenspace on the north side of Riverside Dr. E., within the existing sheet pile/break wall area of the park.

- Alternative 2 – Construct the St. Rose Ave. Pumping Station to the south of Riverside Dr.and east of St.Rose Ave.

- Alternative 3 – Construct the St. Rose Ave. Pumping Station to the south of Riverside Dr. and west of St. Rose Ave

.

- Alternative 4 – Construct the St. Rose Ave. Pumping Station, at the northwest corner of the St. Rose Ave./Wyandotte St.East intersection.

A proper evaluation of these alternatives in accordance with the Municipal Class Environmental Assessment (MCEA) makes Alternative 4 the correct choice as the preferred location of the Rose Park Pumping Station.

The Master Plan Report purports to select Alternative 1 a[redacted] pumping station but acknowledges that:

> [3]*the results of the comparative evaluation does no*[redacted]*cantly more preferred than Alternative 4*

and goes on to say that:

> [4]*Alternative 1 will result in the greatest permanent change to the local urban community due to the greater impact to the St. Rose Ave. Park land. Within the City, and especially in the Riverside Area, waterfront access is limited and is only available through the presence of City owned park lands. Placing the pumping station within the St. Rose Ave. Park (Alternative1) will limit the use of most of the east portion of the Beach (east of the pier/walkway). Alternatives 2, 3, and 4 will require the installation of an outlet chamber*

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[2] Para.6.7.1.7.4 of the Master Plan Report

[3] Para.6.7.1.7.4 of the Master Plan Report – Summary at p.268

[4] Para.6.7.1.7.4 of the Master Plan Report – Permanent Changes to the Urban Community at p.266

within the park which will have less impact to the park land use.

In addition to the significant change to the park use, the existing waterfront view will be compromised. The existing waterfront and Detroit River views are valuable to adjacent homeowners as well as the local community.The placement of this pumping station will have impacts to those that live adjacent or across from the park as it will partially impact the existing view of the river and Detroit city skyline. Alternative 2, 3, and 4 is preferred with respect to the impacts to waterfront view and park impacts as Alternative 1 will have the most permanent impact.

Additional environmental concerns

[redacted] notes in addtion that locating the pump station at St. Rose Avenue Park:

- will destroy a waterfront park. The community uses St. Rose Beach park daily to walk, exercise, picnic, fish, and enjoy family time.
- does not conform to Environment Canada's recommendations for municipalities to adopt strategies that promote healthy natural spaces for future generations.
- poses a significant risk to residents' health, and contradicts the goals of air & water quality and responsible land use set forth in Windsor's Environmental Plan adopted in 2017.
- contravenes Environment Canada’s recommendat [redacted] ould have adequate isolation from residential areas and [redacted] d direction and suitability of soil conditions.
- will allow the north wind across the Detroit River [redacted] on system to fill the surrounding residential neighbor [redacted] nfused air along with chlorine and ammonia. The pump station will also produce noise, pollution and vibration causing residential structural damage.
- poses the risk, in the event of a breakdown, that raw sewage could discharge into the river and affect the water quality and food chain (fish).
- will negatively impact the landscape and visual qualities of the park. The proposal violates both federal and local recommendations of preservation. Windsor's Environmental Plan prioritizes green spaces because they function to enhance social cohesion, mental and physical wellbeing, and family bonding (p6).
- will negatively impact the livelihood of the riverside area and its residents.

The City has not complied with the MCEA

The Master Plan Report does not evaluate the alternatives sufficiently or properly

The Master Plan Report appears to have based it choice of St. Rose Ave. Park (Alternative 1) as the preferred location for the Rose Park Pumping Station on criteria related to displacement of residents/property owners, constructability, and cost[5].

The City has yielded to the temptation to place too much weight on short-term and fiscal considerations and has undervalued the acknowleged adverse long-term environmental and other impacts of locating a new pumping station at St. Rose Ave. Park.

In so doing, the City has failed to comply with the requirements of the MCEA.

The City has confused the preferred solution with the preferred location

Part II.1 of the *Environmental Assessment Act*[6] provides that compliance for certain classes of project may be dealt with in accordance with Class Environmental Assessments. The MCEA is such a Class Assessment and the Master Plan Report purports to comply with it.

Broadly speaking:

- the MCEA process has five phases: 1 Problem or Opportunity, 2 Alternative Solutions, 3 Alternative Design Concepts for Preferred Solution, 4 Environmental Study Report.
- Schedule B projects (projects having the potential [redacted] effects) are subject to Phases 1 and 2, whereas Cl[redacted] potential for significant environmental effects) are [redacted]
- Phase 2 – Alternative Solutions identifies alternat[redacted]m or opportunity by taking into consideration the existing environment, and establishing the preferred solution taking into account public and review agency input.
    - "Alternative solutions" means feasible alternative ways of solving an identified problem (deficiency) or addressing an opportunity, from which a preferred solution is selected. Alternative solutions include "Do Nothing".
- Phase 3 – Alternative Design examines alternative methods of implementing the preferred solution, based upon the existing environment, public and review agency input, anticipated environmental effects and methods of minimizing negative effects and maximizing positive effects on the existing environment.

[5] Para.6.7.1.7.4 of the Master Plan Report – Summary at p.268 second para.

[6] *Environmental Assessment Act, RSO 1990, c E.18*

- o "Alternative design" means alternative ways of designing or carrying out the preferred solution.

The City has conflated the "solution", which is a new pumping station, with the "design", which includes choosing the preferred location of that pumping station.

The City has therefore jumped the gun in trying to fix St. Rose Avenue Park as the "preferred location" for the Rose Park Pumping Station and must carry out further investigation, consultation and evaluation for the "preferred location" as part of Phase 3.

The Master Plan Report classifies the Rose Park pumping station as a Class C Project and, in so doing, acknowledges the need for additional investigation and consultation with property owners.:

> [7]*The project is also classified as a Schedule C project based on the current Municipal Class Environmental Assessment (MCEA) process; therefore, this solution will require additional investigation and consultation with property owners, including consultation with those who own property along St. Rose Ave. and at the Wyandotte St. E./St. Rose Ave. intersection.*

It also goes some way to acknowledging that the City can [redacted] station when it notes:

> [8]*Alternative locations refer to more general areas* [redacted] *located. The City may be able to fine tune the loc*[redacted]

Conclusion

[redacted] submits that:

- The City has failed, up to this point, to give sufficient weight to the adverse effects of selecting St. Rose Ave. Park as the preferred location for the Rose Park Pumping Station and to the relative merits of alternative locations.

- A proper evaluation of alternative locations in accordance with the MCEA makes Alternative 4 the correct choice for the preferred location of the Rose Park Pumping Station.

---

[7] Para.6.7.1.7.4 of the Master Plan Report – Summary at p.268 second para.
[8] Para.6.7.1.7.4 of the Master Plan Report – at p. 260

- The City has failed to comply with the MCEA:
    - It has prematurely chosen St. Rose Avenue Park as a the “preferred” location” for the proposed Rose Park Pumping Station.
    - In so doing, it has conflated “solution”, which is a pumping station, with “design”, which includes the choice of preferred location for the pumping station and forms part of Phase 3 under the MCEA.
    - The City must carry out further investigation, consultation and evaluation for preferred location of the Rose Park Pumping Station as part of Phase 3.
    - Failing that, the City will not have complied with the MCEA and in so doing renders the project vulnerable to legal challenge.

Yours sincerely,

[redacted]

June 14, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment. We write in response to your letter which was received by email on March 25th, 2022.

Comment No. 1: Please would you ensure that our interest as [redacted] *counsel is noted and that we are also added to the mailing list?*

Your interest in the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment (EA) as [redacted] counsel has been noted. In addition, you have been added to the project mailing list and will receive all future notices regarding this study via the email provided [redacted].

Comment No 2: As noted in the [redacted] *Submission, the preferred "solution" for this project, is construction of a new pumping station. This should not be confused with, "preferred location" of that pumping station. The preferred solution was part of Phase 2 of the MCEA but the preferred location still has to be studied and consulted upon under Phase 3. We were pleased to see this acknowledged in the Presentation […]. We were concerned however to see the Presentation goes on to include a slide identifying the St. Rose Beach Park Alternative as the "Preferred Site Location". This presumes the outcome of the Phase 3 exercise at its outset, which is premature and therefore flawed.*

The preferred site location for the proposed St. Rose Stormwater Pumping Station was identified as part of this phase of the Municipal Class Environmental Assessment through in-depth assessments of four alternative locations based on evaluation criteria developed and categorized to assess potential short-term and long-term impacts of each alternative location. The March Public Information Centre (PIC) presentation provided a summary of the evaluation process, site evaluation (advantages/disadvantages of each site alternative and preliminary capital cost analysis), and findings (preferred site location) which were consulted upon at the PIC.

Through the evaluation process, St. Rose Beach Park (Alternative No. 1) was identified as the preferred location based on a number of technical, social, natural environmental, and economic evaluation criteria. This location was rated high in the following categories - implementation and operation of the pumping station; better use of existing stormwater infrastructure; displacement of existing residents and businesses; flexibility to adjust to climate change (pumping capacity); maintenance requirements; and duration of construction.

The outcome of the comparative site evaluation was not predetermined at the outset of Phase 3.

Comment No. 3: Please would you provide a link to any evaluation studies carried out as part of the Phase 3 of the MCEA.

The comparative site evaluation and other studies carried out as part of this phase of the Municipal Class Environmental Assessment will be compiled in the Environmental Study Report (ESR) for this project. The ESR is not finalized at this point in the EA process and is anticipated to be available in the fall of 2022.

The details of the initial evaluation of the alternative site locations carried out under the City's Sewer and Coastal Flood Protection Master Plan are available at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/Sewer-and-Coastal-Flood-Protection-Master-Plan.aspx] in the appendices: 'E-2: St. Rose Avenue Pumping Station – Pumping Station Location Comparative Evaluation (October 2020)' which can be found within 'Appendix E – Technical Volume 2: Flood Reduction Alternative Solution Development' of the Master Plan.

Information on the site evaluation carried out under this phase of the Municipal Class Environmental Assessment can be found on the project website in Stantec Consulting Ltd.'s (Stantec) technical memorandum entitled 'Comparative Evaluation of Site Location' at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx].

Comment No. 4: Cost Comparison of Site Alternatives – please supply data showing the relative cost of the Wyandotte site compared with the St. Rose Park site, e.g. expropriation costs, additional infrastructure requirements etc.

The high level financial analysis was provided during the March PIC. Please refer to the PIC slides on the City's website at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx]. Additionally, this information is available in the technical memorandum on the project website.

Comment No. 5: Environmental – please provide any environmental study that was submitted to the City comparing the site alternatives.

Please see response to Comment No. 3.

Comment No. 6: Site Design – please clarify why the design shown in the concept drawing has now been down graded to a cinderblock building.

The three-dimensional (3D) renderings presented during the March PIC represent a preliminary proposal for the architectural design of the onsite electrical building. Please note that the grey block material shown in the concept drawings represents a limestone finish. The comments provided regarding the proposed building material will be noted in the Environmental Study Report and will be considered during the detailed design phase (a future phase) of the Municipal Class EA process.

Comment No. 7: In the meantime, [redacted] strongly objects to the selection of Alternative 1: St. Rose Beach Park as the "preferred location" as premature and, for the reasons set out in the [redacted] Submission, on the merits. [redacted] proposes Alternative 4: the St. Rose Ave. /Wyandotte St. East intersection as the better and preferable choice.

Through the technical evaluation processes, St. Rose Beach Park (Alternative No. 1) was identified as the preferred alternative based on a number of technical, social, natural environmental, and economic evaluation criteria. This location was rated high in the following categories - implementation and operation of the pumping station; better use of existing stormwater infrastructure; displacement of existing residents and businesses; flexibility to adjust to climate change (pumping capacity); maintenance requirements; and duration of construction. The park will continue to be utilized by the public with new landscaping features and park amenities, allowing the community to enjoy recreational activities.

As summarized in the presentation materials for the March 2022 PIC, as well as in Stantec's technical memo, the evaluation has identified Alternative No. 4 as a technically complex solution that will require multiple property acquisitions that would displace residents, a commercial property, and require numerous utility relocations. The existing storm sewer system was constructed with the natural grade of the land in mind, where runoff flows toward the river to the existing outlet at St. Rose Beach Park. Alternative No. 4 (Wyandotte Street) would require a more complex and costly stormwater pumping station and would require additional storm sewers and forcemains, which would compromise the reliability of flood prevention.

A second PIC is scheduled for Thursday June 23, 2022. A notice was sent June 10th to all interested residents and stakeholders to participate at this upcoming event to provide feedback on the alternative design options presented for the preferred location. The upcoming PIC will focus on the various design concepts for the proposed pumping station at the St. Rose Beach Park.

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

Cc: Janelle Coombs

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

The pumping station location will be unsightly to the area.

NAME [redacted]

EMAIL ADDRESS [redacted]

TELEPHONE NO. [redacted]

DATE May 17, 2022 SIGNATURE [redacted]

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.

Office of the Commissioner of Infrastructure Services

June 16, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre (PIC) held on March 2nd, 2022. This letter is in response to your comment form which was received via mail.

Comment: The pumping station location will be unsightly to the area.

Following a detailed evaluation of the four site locations, *Alternative No. 1 (St. Rose Beach Park)* was identified as the preferred location based on a balance of evaluation criteria. Benefits of the St. Rose Beach Park location include the ability to meet flood mitigation objectives while mitigating undesirable social, economic, and natural environmental impacts. This location does not require displacement of existing residents or businesses and has the most flexibility to adjust to climate change, with room for potential expansion to meet future needs. Construction at this location will be less complicated, it will require less maintenance and have lower operational costs. The disruption to the nearby residents and community during construction will also be the least impactful.

For more information on the site evaluation carried out under this phase of the Municipal Class Environmental Assessment can be found on the project website in Stantec Consulting Ltd.'s (Stantec) technical memorandum entitled 'Comparative Evaluation of Site Location' at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx].

The proposed pumping station is an important part of a City-wide solution to widespread flooding concerns and is necessary to protect residents from extreme weather events. Impacts to the waterfront park will be mitigated by designing the pumping station in a way that minimizes disruption to waterfront views and allows for a majority of the park to remain available for the community to use. Incorporating social, architectural, and landscaping features in the park will be considered during the detailed design phase to allow the community to enjoy recreational activities in the space.

Your comment regarding the appearance of the pumping station has been noted as part of this environmental assessment study and will be considered during the detailed design of the proposed pumping station and associated infrastructure. In the final design phase, the architectural design will soften the appearance of the proposed building and ensure it is suitable for the area. The character of the park and the neighbourhood will be considered in the design of landscaping, building architecture, and amenities.

If you are interested in participating and/or would like to be added to our mailing list, please contact Chrissy Jung of Stantec Consulting Ltd at Chrissy.Jung@stantec.com.

A second PIC is scheduled for Thursday June 23, 2022. A notice was sent June 10th to all interested residents and stakeholders to participate at this upcoming event to provide feedback on the alternative design options presented for the preferred location. The upcoming PIC will focus on the various design concepts for the proposed pumping station at the St. Rose Beach Park.

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

Cc: J. Coombs

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

Note Ont. Law for M S. C

As a Resident only steps from the proposed Flood water Pumps, note I suffer from M.C.S Symtoms.

MCS is not well understood therefor it would be best to find information on youtube.

* 1) Noise sensitivity affected M.C.S.

*> Int Arch Occup Envioron Health Feb, 90(2): 189-196: 10.1007/s00420-016-1185-8

2) M.C.S. Lead Ont. Women to assisted death.

NAME [redacted]

EMAIL ADDRESS [redacted]

TELEPHONE NO. [redacted]

DATE April 19 2022 SIGNATURE [redacted]

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.

THE CITY OF WINDSOR ONTARIO, CANADA

Office of the Commissioner of Infrastructure Services

June 16, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre (PIC) held on March 2nd, 2022. This letter is in response to your comment form which was received via mail.

Comment: Note Ontario Law for MSC [Multiple Chemical Sensitivities]. As a resident only steps from the proposed flood water pumps, note I suffer from MCS symptoms.

Your comment has been noted as part of this environmental assessment study and will be considered during the detailed design phase of the proposed pumping station. The proposed pumping station will be designed and operated in accordance with all applicable regulatory codes and standards including those administered by the Ontario Ministry of Environment, Conservation, and Parks (MECP) noise, vibrations, and emissions regulations.

For more information on the evaluation of the proposed locations, please visit the project website for Stantec Consulting Ltd.'s (Stantec) technical memorandum entitled 'Comparative Evaluation of Site Location' at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx].

A second PIC is scheduled for Thursday June 23, 2022. A notice was sent June 10th to all interested residents and stakeholders to participate at this upcoming event to provide feedback on the alternative design options presented for the preferred location. The upcoming PIC will focus on the various design concepts for the proposed pumping station at the St. Rose Beach Park.

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

Cc: J. Coombs

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

- It is going to be unsightly

- There must be another place to put the pumping station.

- It is going to be loud.

- The pumping station will change the whole landscape at St. Rose Beach.

- When we purchased this lot, we were told by the City of Windsor that they would never build at St. Rose Beach.

NAME [redacted]

EMAIL ADDRESS [redacted]

TELEPHONE NO. [redacted]

DATE April 20/22 SIGNATUR[redacted]

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.

Office of the Commissioner of Infrastructure Services

June 16, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre (PIC) held on March 2nd, 2022. This letter is in response to your comment form which was received by mail.

Comment No. 1: It is going to be unsightly. There must be another place to put the pumping station.

Following a detailed evaluation of the four site locations, *Alternative No. 1 (St. Rose Beach Park)* was identified as the preferred location based on a balance of evaluation criteria. Benefits of the St. Rose Beach Park location include the ability to meet flood mitigation objectives while mitigating undesirable social, economic, and natural environmental impacts. This location does not require displacement of existing residents or businesses and has the most flexibility to adjust to climate change, with room for potential expansion to meet future needs. Construction at this location will be less complicated, it will require less maintenance and have lower operational costs. The disruption to the nearby residents and community during construction will also be the least impactful.

For more information on the site evaluation carried out under this phase of the Municipal Class Environmental Assessment can be found on the project website in Stantec Consulting Ltd.'s (Stantec) technical memorandum entitled 'Comparative Evaluation of Site Location' at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx].

Comment No. 2: It is going to be loud.

Your comment has been noted as part of this environmental assessment study and will be considered during the detailed design phase of the proposed pumping station. The proposed pumping station will be designed and operated in accordance with all applicable regulatory codes and standards including those administered by the Ontario Ministry of Environment, Conservation, and Parks (MECP) noise, vibrations, and emissions requirements.

Comment No. 3: The pumping station will change the whole landscape of St. Rose Beach.

The proposed pumping station is an important part of a City-wide solution to widespread flooding concerns and is necessary to protect residents from extreme weather events. Impacts to the waterfront park will be mitigated by designing the pumping station in a way that minimizes disruption to waterfront views and allows for a majority of the park to remain available for the community to use. Incorporating social, architectural, and landscaping features in the park will be considered during the detailed design phase to allow the community to enjoy recreational activities in the space.

Comment No. 4: When we purchased this lot, we were told by the City of Windsor that they would never build at St. Rose Beach.

St. Rose Beach Park (alternative 1) is currently zoned as Green District 1.1 (GD1.1) and would likely require a zoning by-law amendment to be utilized for the proposed pumping station site. Alternatives 2 and 3 were also identified as likely requiring a zoning by-law amendment to facilitate the proposed stormwater pumping station. An application for a zoning by-law amendment is a mechanism under the Planning Act to allow the consideration of a change to the current zoning of a property based on the details of the requested change in use. With St. Rose Beach Park identified as the preferred site for the pumping station through the evaluation process, the City will follow the required planning processes required to permit the necessary structures.

A second PIC is scheduled for Thursday June 23, 2022. A notice was sent June 10th to all interested residents and stakeholders to participate at this upcoming event to provide feedback on the alternative design options presented for the preferred location. The upcoming PIC will focus on the various design concepts for the proposed pumping station at the St. Rose Beach Park.

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

Cc: J. Coombs

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

I dislike the idea of a pumping station at the end of St Rose as proposed

I would like it to be underground like they have in London Ont.
Thank you.

NAME [redacted]

EMAIL ADDRESS [redacted]

TELEPHONE NO. [redacted]

DATE 18/04/2022 SIGNATURE [redacted]

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.

Office of the Commissioner of Infrastructure Services

June 16, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre (PIC) held on March 2nd, 2022. This letter is in response to your comment form which was received by mail.

Comment No. 1: I dislike the idea of a pumping station at the end of St. Rose [Avenue] as proposed.

Following a detailed evaluation of the four site locations, *Alternative No. 1 (St. Rose Beach Park)* was identified as the preferred location based on a balance of evaluation criteria. Benefits of the St. Rose Beach Park location include the ability to meet flood mitigation objectives while mitigating undesirable social, economic, and natural environmental impacts. This location does not require displacement of existing residents or businesses and has the most flexibility to adjust to climate change, with room for potential expansion to meet future needs. Construction at this location will be less complicated, it will require less maintenance and have lower operational costs. The disruption to the nearby residents and community during construction will also be the least impactful.

For more information on the site evaluation carried out under this phase of the Municipal Class Environmental Assessment can be found on the project website in Stantec Consulting Ltd.'s (Stantec) technical memorandum entitled 'Comparative Evaluation of Site Location' at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx].

Your comment has been noted as part of this environmental assessment study and will be considered during the detailed design phase of the proposed pumping station and associated infrastructure. In the detailed design phase, the architectural design will soften the appearance of the proposed building and ensure it is suitable for the area. The character of the neighbourhood and current use of the park will be considered in the design of landscaping, building architecture, and amenities.

Comment No. 2: I would like it to be underground like they have in London, Ontario.

The proposed pumping station will be designed such that the pumping chambers are located at or below the ground level. This will decrease the amount of infrastructure that disrupts the waterfront view and maximizes the greenspace within the park. Based on regulatory building codes and design standards for this site, the electrical equipment will be located in above ground structures. Various design concepts and site layouts will be considered in an effort to minimize the impact of these features.

A second PIC is scheduled for Thursday June 23, 2022. A notice was sent June 10th to all interested residents and stakeholders to participate at this upcoming event to provide feedback on the alternative design options presented for the preferred location. The upcoming PIC will focus on the various design concepts for the proposed pumping station at the St. Rose Beach Park.

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

Cc: J. Coombs

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

[redacted]

We do not feel this is an optimal spot for a pumping station as to disrupt the entire small park's green space utility. This is a 100 year+ project and doesn't deserve to be rushed.

The pumping station should be located in the area where the doctor's office is at the north west corner of wyandotte. Many people use the grass area for yoga, tai chi and running their dogs. To destroy this tiny park for no reason is foolish. The grass area needs to be maintained as is, and moving the location for a trivial amount of money in the big scheme of things is the most prudent approach.

The proposed building will also attract even more unsavoury people to the park. I have called the police multiple times for people lighting fires, camping and doing drugs in the park; if a building is introduced, it will provide a structure to hide behind and increase these activities. This will also make it more difficult for Windsor Police to maintain the safety of the area.

This is a $5b project. A small amount to save a sacred part of the waterfront is a small price to pay especially when spread over 100+ years.

NAME [redacted]

EMAIL ADDRESS [redacted]

TELEPHONE NO. [redacted]

DATE June 6th, 2022 SIGNATURE [redacted]

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.

Office of the Commissioner of Infrastructure Services

June 16, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre held on March 2nd, 2022. This letter is in response to your comment form which was received by email on June 6th, 2022.

Comment No. 1: We do not feel this is an optimal spot for a pumping station as to disrupt the entire small park's green space utility. This is a 100 year+ project and does not deserve to be rushed. The pumping station should be located in the area where the doctor's office is at the North West corner of Wyandotte. Many people use the grass area for yoga, tai chi and running their dogs. To destroy this tiny park for no reason is foolish. The grass area needs to be maintained as is, and moving the location for a trivial amount of money in the big scheme of things is the most prudent approach.

Following a detailed evaluation of the four site locations, *Alternative No. 1 (St. Rose Beach Park)* was identified as the preferred location based on a balance of evaluation criteria. Benefits of the St. Rose Beach Park location include the ability to meet flood mitigation objectives while mitigating undesirable social, economic, and natural environmental impacts. This location does not require displacement of existing residents or businesses and has the most flexibility to adjust to climate change, with room for potential expansion to meet future needs. Construction at this location will be less complicated, it will require less maintenance and have lower operational costs. The disruption to the nearby residents and community during construction will also be the least impactful.

The existing storm sewer system was constructed with storm runoff flowing toward the existing outlet at St. Rose Beach Park. Alternative No. 1 maintains this natural flow of water which provides technical advantages for the implementation and operation of the pumping station and the ability to utilize existing stormwater infrastructure. With the implementation of the proposed infrastructure, the park would remain open to the public and would have more landscaping features and additional park amenities allowing the community to continue to enjoy recreational activities.

More information on the site evaluation carried out under this phase of the Municipal Class Environmental Assessment can be found on the project website in Stantec Consulting Ltd.'s (Stantec) technical memorandum entitled 'Comparative Evaluation of Site Location' at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx].

Comment No. 2: The proposed building will also attract even more unsavoury people to the park. I have called the police multiple times for people lighting fires, camping and doing drugs in the park; if a building is introduced, it will provide a structure to hide behind and increase these activities. This will also make it more difficult for Windsor Police to maintain the safety of the area.

Your comment has been noted as a part of this environmental assessment study and will be considered in the detailed design phase of the proposed pumping station and associated infrastructure. As part of the Municipal Class Environmental Assessment process, this study will be shared with City Council, Ontario Ministry of Environment, Conservation and Parks (MECP), and the City of Windsor Police Services. The proposed pumping station will be designed in accordance with applicable regulatory codes and standards which will include provisions for appropriate lighting and site security measures.

Comment No. 3: This is a $5b project. A small amount to save a sacred part of the waterfront is a small price to pay especially when spread over 100+ years.

A financial analysis was carried out as part of the site assessment process and was presented in the PIC presentation slideshow (Slide 19). The high level financial analysis can be found on the project website in Stantec's technical memorandum entitled 'Comparative Evaluation of Site Location' at [https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/St-Rose-Storm-Water-Pumping-Station-Environmental-Assessment.aspx].

A second PIC is scheduled for Thursday June 23, 2022. A notice was sent June 10th to all interested residents and stakeholders to participate at this upcoming event to provide feedback on the alternative design options presented for the preferred location. The upcoming PIC will focus on the various design concepts for the proposed pumping station at the St. Rose Beach Park.

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

Cc: J. Coombs

APPENDIX C

Response from Review Agencies – Public Open House No. 2

From:	Horrobin, Barry
To:	Jung, Chrissy; jcoombs@citywindsor.ca
Subject:	RE: 165620239: Notice of Public Information Centre No. 2 - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario
Date:	Friday, June 10, 2022 1:17:23 PM

Chrissy and Janelle:

I would not this project does not have a significant impact on either public safety and security in general or the operations of the Windsor Police Service. However, I would note the preferred site option would carry the least amount of problematic consequences, post construction, compared to the other site options. This is because it has the greatest amount of physical separation space from nearby residential land uses, the result from which minimizes concerns of noise, trespassing, suspicious behavior, etc. The preferred option being put forth is therefore supported by us as being the one most likely to have the fewest problems, once constructed and in operation.

Respectfully,

Barry Horrobin, B.A., M.A., CLEP, CMM-III
Director of Planning & Physical Resources
WINDSOR POLICE SERVICE

IALEP INTERNATIONAL ASSOCIATION OF LAW ENFORCEMENT PLANNERS

Advanced Certified Law Enforcement Planner

From: Jung, Chrissy <Chrissy.Jung@stantec.com>
Sent: Friday, June 10, 2022 10:50 AM
Subject: 165620239: Notice of Public Information Centre No. 2 - Class EA St. Rose Storm Water Pumping Station, City of Windsor, Ontario

EXTERNAL EMAIL: Do not click any links or open any attachments unless you trust the sender and know the content is safe. The Original Sender of this email is "Jung, Chrissy" <Chrissy.Jung@stantec.com>

To Whom it May Concern,

The City of Windsor is undertaking the Class Environmental Assessment (EA) process to develop a long-term solution to improve efficiency and reduce the risk of flooding caused by severe storm events in the St. Rose drainage area. The City is hosting a second Public Information Centre (PIC) to present alternative design concepts for the proposed St. Rose Pumping Station and receive input from interested residents and stakeholders. The PIC will be held on Thursday June 23rd, 2022 (3:00 to 7:00 pm) at the WFCU Centre, 8787 McHugh Street, Windsor, ON (Second Floor – Michigan Hall). You are receiving this email because you have been recognized as a representative for your local municipality, interest group, and/or agency.

A copy of the Notice of Public Information Centre for the project is attached and additional information regarding the project is available on the City Webpage: St. Rose Stormwater Pumping Station Environmental Assessment (citywindsor.ca)

If you have any comments or concerns regarding this project, please contact the undersigned.

Sincerely,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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APPENDIX C

Response from Public – Public Open House No. 2

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE NO. 2 – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

LOCATION OPTION 3 preferred
with OPTION 3 For the buildings.

If option 1 or 2 are decided upon
For location
- option 2 brown brick for the
building.

NAME [redacted]

EMAIL ADDRESS [redacted]

TELEPHONE NO. [redacted]

DATE June 23 / 2021 SIGNATURE [redacted]

Stantec

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Office of the Commissioner of Infrastructure Services

September 15, 2022

[redacted]

Dear [redacted],

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre (PIC) No. 2 held on June 23rd, 2022. This letter is in response to your comment form which was received in person at PIC No. 2.

We are pleased to hear you are in agreement with the recommended pumping station layout and architectural building design. Your comment form will be included in the Environmental Study Report (ESR). This ESR will identify, evaluate, and report on the alternative design concepts for the proposed pumping station and is anticipated to be posted for public review later this year. A notice of the public review period will be sent to all interested residents and stakeholders to participate and provide feedback.

Any further comments or questions, please do not hesitate to contact the project administrator, Janelle Coombs, P.Eng, at 519 255-6100 ext.6004 or email at jcoombs@citywindsor.ca.

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

cc: Councillor Gignac
France Isabelle-Tunks – ED of Engineering
Chrissy Jung – Stantec Consulting Ltd.

St. Rose Stormwater Pumping Station
Municipal Class Environmental Assessment
Public Information Centre-Comment Form

[redacted]

To Whom it May Concern,

I am responding to the public meeting held on June 23, 2022 and the *Comparative Evaluation of Site Location*, prepared by Stantec Consulting Ltd (May 2022).

I agree with the report's assumption, "The implementation of a stormwater pumping station for the St. Rose drainage area is vital to improve efficiency and reduce the risk of flooding caused by severe storm events for current and future generations" (P.31). I continue to argue for placing the pumping station on Wyandotte, where we can preserve the 70 year old park for future generations.

Under 3.2.1.2 *Flexibility to Adapt to Climate Change*, the assumption is a prediction of more rainfall and a future need to increase capacity (p.13). The report reads, "Based on these climate change predictions, the required capacity of the proposed stormwater pumping station for this drainage area is only expected to increase in the future. For this reason, it is beneficial for the selected site to have additional space for future expansion. Alternative number 1 is located in the St. Rose Beach Park and the proposed pumping station would occupy approximately 50% of the lot" (p13). The report rated Alternative 1 as superior to Alternative 4 in respect to flexibility to expand.

The report does not take into consideration Alternative 4's proximity to a vast underutilized parking lot adjacent to the Wyandotte site, nor does it take into consideration the use of cistern technology that could be used to cope with stormwater surges. Ontario's Environmental Plan (2018) states, "We know that climate change poses a serious threat to Ontario's natural areas and conservation of these areas can play an important role in mitigating and adapting to climate change. We will protect and enhance our natural areas, support conservation efforts,...and promote the importance of healthy **natural spaces** for future generations to use and enjoy"(p.46). Has the City inquired into Provincial and Federal financial support to cover the 15-20% cost differential to place the pumping station on a commercially zoned site? Also, given the size of the adjacent parking lot, it would be unnecessary to expropriate residential property or place the pumping station in close proximity to residences on St. Rose. The owner of the podiatry office is willing to relocate his business.

As I have written earlier, the Provincial Policy Statement (2020) states, "Municipal official plans are the most important vehicle for implementation of this Provincial Policy Statement, and for achieving comprehensive, integrated and long-term planning. Official plans shall identify provincial interests and set out appropriate land use designations and policies"(p.1). The Policy

Statement instructs municipalities to provide "…an equitable distribution of publicly accessible **natural settings and minimize negative impacts on these areas**"(p.17). Permeable surface is not part of natural settings, and a pumping station complex that takes up 50% of the park, with expectations of expansion, is not a minimal impact on the park.

The City of Windsor's Environmental Plan (2017) Goal C- *Responsible Land Use-Objective C6* states, "Acquire or transition **additional lands for integration into our parks, natural areas, and natural heritage systems**"(p.25). The recommendation of Alternative 1 is completely contradictory to this objective. Alternative 4 allows for an acquisition of land that has the effect of protecting natural area and a 70 year old park.

In respect to the report's finding that Alternative 4 is **superior** to Alternative 1 in terms of coastal flood risk, placing the pumping station in a location where the City is already planning for overland flooding is not a good long term plan. The report's assumption is to plan for what has been the worst overland flooding in the past 100 years. Present day climate change environmental disasters, however, point to events that have never been seen before. We cannot assume water levels will not rise much more in the next 100 years. For this reason, it makes much more sense for long term planning to place the pumping station and generator on Wyandotte.

The *Comparative Evaluation of Site Location* weighs all factors equally, which I believe is a mistake. For long term planning, coastal flood risk, preservation of natural spaces, should weigh heavier than temporary inconveniences of construction, and even a 15-20% cost differential. We should be thinking what would be best for the community in future decades. Using an environmental asset that is cherished by the community and worth millions of dollars in terms of real estate value, should not be the solution to the environmental problem of flooding. We can do better!

I request, without prejudice, if the pumping station ends up in the park, I be on the list for consultation on the design and placement. Thank you for your consideration.

Sincerely,

[redacted]

Office of the Commissioner of Infrastructure Services

September 15, 2022

[redacted]

Dear [redacted]

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre No. 2 held on June 23rd, 2022, and the Comparative Evaluation of Site Location prepared by Stantec Consulting Ltd. This letter is in response to your comments which were received by email on August 4th, 2022.

Comment No. 1: Under 3.2.1.2 Flexibility to Adapt to Climate Change, the assumption is a prediction of more rainfall and a future need to increase capacity (p.13). The report reads, "Based on these climate change predictions, the required capacity of the proposed stormwater pumping station for this drainage area is only expected to increase in the future. For this reason, it is beneficial for the selected site to have additional space for future expansion. Alternative number 1 is located in the St. Rose Beach Park and the proposed pumping station would occupy approximately 50% of the lot" (p13). The report rated Alternative 1 as superior to Alternative 4 in respect to flexibility to expand. The report does not take into consideration Alternative 4's proximity to a vast underutilized parking lot adjacent to the Wyandotte site, nor does it take into consideration the use of cistern technology that could be used to cope with stormwater surges. Also, given the size of the adjacent parking lot, it would be unnecessary to expropriate residential property or place the pumping station in close proximity to residences on St. Rose. The owner of the podiatry office is willing to relocate his business.

In identifying the potential need for future expansion to accommodate climate change, 'The Comparative Evaluation of Site Location' technical memorandum (Stantec Report) identifies St. Rose Beach Park as the preferred location because of the additional space the park provides to allow for future build-out. At that time, when expansion of the pumping station is required, the City will not have to expropriate additional lands. The other three options limit the City's capabilities of expansion because of the need to acquire additional private property.

Although Alternative 4 (Wyandotte) is located adjacent to a commercial parking lot, the property acquisition process is dependent on the property owner's willingness to sell. Furthermore, the acquisition cost of this property will vary depending on the current real estate market. These factors create a significant level of uncertainty and as a result, the Park, is the preferred location.

Comment No. 2: Has the City inquired into Provincial and Federal financial support to cover the 15-20% cost differential to place the pumping station on a commercially zoned site?

The preliminary opinion of probable cost presented in Stantec's Report shows that the anticipated cost for Alternative 1 (St. Rose Beach Park) is approximately $22,000,000 and for Alternative 4 (Wyandotte Street) the cost is approximately $29,200,000 plus the cost of acquiring one residential property, one commercial property, and a portion of the adjacent commercial parking lot (per Stantec's Report). This corresponds to a minimum estimated cost increase of 33% plus the cost of property acquisitions.

At this time, no financial support programs from the provincial or federal government are available for the construction of the pumping station. The City will be responsible for funding 100% of the costs including any land acquisitions or expropriations.

Comment No. 3: As I have written earlier, the Provincial Policy Statement (2020) states, "Municipal official plans are the most important vehicle for implementation of this Provincial Policy Statement, and for achieving comprehensive, integrated and long-term planning. Official plans shall identify provincial interests and set out appropriate land use designations and policies"(p.1). The Policy Statement instructs municipalities to provide "…an equitable distribution of publicly accessible natural settings and minimize negative impacts on these areas"(p.17). Permeable surface is not part of natural settings, and a pumping station complex that takes up 50% of the park, with expectations of expansion, is not a minimal impact on the park.

Ontario's Environmental Plan (2018) states, "We know that climate change poses a serious threat to Ontario's natural areas and conservation of these areas can play an important role in mitigating and adapting to climate change. We will protect and enhance our natural areas, support conservation efforts,…and promote the importance of healthy natural spaces for future generations to use and enjoy"(p.46).

The City of Windsor's Environmental Plan (2017) Goal C- Responsible Land Use-Objective C6 states, "Acquire or transition additional lands for integration into our parks, natural areas, and natural heritage systems"(p.25). The recommendation of Alternative 1 is completely contradictory to this objective. Alternative 4 allows for an acquisition of land that has the effect of protecting natural area and a 70 year old park.

In section 3.2.2.3 of Stantec's Report, environmental policies and practices at all levels of government were considered in the evaluation process. Stantec's Report considers the Environmental Master Plan (EMP) and recognizes the five goals that have been set out by the EMP. It identifies Goal B, which includes the importance of improving the City's stormwater management system to reduce flooding risk to residents. As described in the Stantec Report, a list of criteria was developed to allow for a fulsome evaluation of the potential short and long-term effects on the environment (including technical, natural environmental, social and economic). The results from the Stantec Report represent a balanced approach to determining the preferred location for the proposed pumping station. The preferred site was determined based on overall net effects on the environment at each location considering short-term impacts, long-term impacts and potential mitigation options.

Comment No. 4: In respect to the report's finding that Alternative 4 is superior to Alternative 1 in terms of coastal flood risk, placing the pumping station in a location where the City is already planning for overland flooding is not a good long term plan. The report's assumption is to plan for what has been the worst overland flooding in the past 100 years. Present day climate change environmental disasters, however, point to events that have never been seen before. We cannot assume water levels will not rise much more in the next 100 years. For this reason, it makes much more sense for long term planning to place the pumping station and generator on Wyandotte.

To provide protection against coastal flooding, the proposed pumping station will be designed such that the generator, electrical building, and top elevation of the pumping station are at or above the instantaneous water level for the 1 in 100-year design storm. The 1 in 100-year storm used in engineering design is a rainfall event that will be equalled or exceed on average every 100 years or, in other words, is a storm that has a 1% chance of occurring in any given year. The standard level of service throughout the City of Windsor is defined as the 1 in 100-year design storm based on expert opinion provided in the Essex Region Conservation Authority's Windsor/Essex Region Stormwater Management Standards Manual.

Comment No. 5: The Comparative Evaluation of Site Location weighs all factors equally, which I believe is a mistake. For long term planning, coastal flood risk, preservation of natural spaces, should weigh heavier than temporary inconveniences of construction, and even a 15-20% cost differential [Note: cost differential presented in the Technical Memorandum is 33 % + cost of property acquisitions]. *We should be thinking what would be best for the community in future decades. Using an environmental asset that is cherished by the community and worth millions of dollars in terms of real estate value, should not be the solution to the environmental problem of flooding.*

An extensive list of social, natural environmental, technical and economic criteria has been evaluated including potential short and long-term impacts and mitigation options to determine the preferred location. The results from the technical memo provide a balanced approach when determining the preferred location of the pumping station. In consideration of the long-term impacts of selecting the St. Rose Beach property, the City has prioritized minimizing disruption to waterfront views to allow for a majority of the park to remain available for the community to use. Incorporating additional social, architectural, and landscaping features in the park will be considered during the detailed design phase to allow the community to enjoy recreational activities in the space.

Comment No. 6: I request, without prejudice, if the pumping station ends up in the park, I be on the list for consultation on the design and placement.

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment. Your comment form will be included in the Environmental Study Report (ESR). This ESR will identify, evaluate, and report on the alternative design concepts for the proposed pumping station and is anticipated to be posted for public review later this year. A notice of the public review period will be sent to all interested residents and stakeholders to participate and provide feedback. The City has noted your desire to participate in providing comments during the detailed design of the proposed St. Rose Stormwater Pumping Station. Your opportunity to provide comment will be during the public review period.

Any further comments or questions, please do not hesitate to contact the project administrator, Janelle Coombs, P.Eng, at 519 255-6100 ext.6004 or email at jcoombs@citywindsor.ca

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

cc: Councillor Gignac
France Isabelle-Tunks – ED of Engineering
Chrissy Jung – Stantec Consulting Ltd.

ST. ROSE STORMWATER PUMPING STATION
MUNICIPAL CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE NO. 2 – COMMENT FORM

Please provide your comments or concerns on the presented material for the St. Rose pumping station:

Dear Chrissy / Stantec

I still feel that the best location is (option 4) at wyandotte street in order to preserve the Park at St. Rose for the windsor east residents and windsor city. this park is very popular for the residents in the area and the damage will be irreparable to the area & the residents and given the close proximity to my house it will significantly cause Environmental & Psychological & Health issues. this project is permanent and will cause permanent damage to the residents for generations. if the pumping station to be placed in the park, I request I would be consulted on the design & placement and (without prejudice). the level you showed us should be completely flat to preserve the park I believe the risk of flooding to pumping st. higher if placed at St. Rose Park. thus I believe it's not the right place. Again I request to be consulted and to have the final lesson given the location and (without prejudice) - Thank you again

NAME

EMAIL ADDRESS

[redacted]

TELEPHONE NO.

DATE 4/8/2022 SIGNATURE [redacted]

Stantec

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Note: I am aware you have made an effort to preserve the Park in the New (latest) design which is (appreciated) but please note it still need to take my notes into your consideration. thanks.

From: [redacted]
To: Jung, Chrissy
Subject: Re: 165620239: City of Windsor, St. Rose Stormwater Pumping Station Class Environmental Assessment - Response to Comment Form
Date: Thursday, August 4, 2022 7:14:27 PM
Attachments: St Rose 2nd answer.pdf

Dear chrissy
I hope you are well
Thank you for the latest explanation and demonstration of the new design and location for the proposed pumping station at St.Rose
Please see attached my response following the latest meeting in July
I still feel the best option would be option 4 , although you made a good effort to make the design and the location better compared to the previous design (in order to preserve the park) in terms of overall design and location in the park,which is appreciated .

Having said that , I still feel the best option is at Wyandotte street , and I still feel that there are many notes which I mentioned during the meeting to you and to your colleague (the other engineer) in regards to the new design level and height of the structure being underground at St.Rose park.
Given the fact I am directly affected by this , I request to be consulted on the final placement, location and final design if it comes to the final decision and "without prejudice"
we are aware that there are legal and environmental steps that need to be completed before the final decision is made.
As you know this will cause significant environmental and psychological damage to me and my family , if my input in the location and design are not taken into your consideration given the fact I am directly affected by this and the park is immediately in front of my house which would negatively impact our quality of life; and would devalue our property.

I thank you for your consideration and your effort.
Kind Regards
[redacted]

On Mon, 20 Jun 2022 at 17:32, Jung, Chrissy <Chrissy.Jung@stantec.com> wrote:

> Hello [redacted]
>
> On behalf of the City of Windsor, please see the attached response to your comment form submission dated March 7th, 2022.
>
> Kind Regards,
>
> **Chrissy Jung** M.A.Sc., E.I.T.
>
> Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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[redacted]

Office of the Commissioner of Infrastructure Services

September 15, 2022

[redacted]

[redacted]

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Public Information Centre held on June 23, 2022. This letter is in response to your comment form which was received by email on August 4, 2022.

Comment No. 1: I still feel the best location is (Option 4) at Wyandotte Street in order to preserve the Park at St. Rose for the Windsor East residents and Windsor City. This park is very popular for the residents in the area and the damage will be irreparable to the area and the residents and given the close proximity to my house it will significantly cause environmental, psychological, and health issues. This project is permanent and will cause permanent damage to the residents for generations.

The proposed pumping station is an important part of a City-wide solution to address widespread flooding concerns and is necessary to protect residents in this area from extreme weather events. An extensive list of social, natural environmental, technical and economical criteria was developed and evaluated for each of the four alternative sites for the proposed pumping station, with the outcome of St. Rose Beach Park being identified as the preferred site.

In considering the long-term impacts of selecting St. Rose Beach, the proposed layout is purposefully designed to minimize disruption to waterfront views and allow for a majority of the park to remain available for the community to use. Incorporating additional social, architectural, and landscaping features in the park will be considered during the detailed design phase to allow the community to enjoy recreational activities in the space.

Comment No. 2: The [elevation of the top of the pumping station] you showed us should be completely flat to preserve the Park. I believe the risk of flooding to pumping station is higher if placed at the St. Rose Park. Thus, I believe it is not the right place.

Based on electrical codes and standards, the electrical building and emergency generator cannot be built below the projected elevation of 177.100 meters (instantaneous water level for the 1 in 100-year design storm). The existing grade on the site varies from approximately 176.300 to 177.000 meters; therefore, the electrical building and emergency generator cannot be 'flat' or constructed below the existing grade of the site.

To provide protection against coastal flooding, the proposed pumping station within St. Rose Beach Park will be designed such that the generator, electrical building, and top elevation of the pumping station are at or above the instantaneous water level for the 1 in 100-year design storm. This level of service was determined based on expert opinion provided in the Windsor/Essex Region Stormwater Management Standards Manual issued by the Essex Region Conservation Authority (ERCA). ERCA ensures that people and properties are safe from the risks posed by flooding, erosion, and other natural hazards. An ERCA permit will be required for the pumping station design.

Comment No. 3: If the pumping station is to be placed in the Park, I request I would be consulted on for the design and placement (without prejudice). Given the fact I am directly affected by this, I request to be consulted on the final placement, location, and final design if it comes to the final decision and "without prejudice". We are aware that there are legal and environmental steps that need to be completed before the final decision is made.

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment. Your comment form will be included in the Environmental Study Report (ESR). This ESR will identify, evaluate, and report on the alternative design concepts for the proposed pumping station and is anticipated to be posted for public review later this year. A notice of the public review period will be sent to all interested residents and stakeholders to participate and provide feedback. The City of Windsor has noted your desire to participate in providing comments during the detailed design of the proposed St. Rose Stormwater Pumping Station. There will be an opportunity to provide further comment when the ESR is posted for public review.

Any further comments or questions, please do not hesitate to contact the project administrator, Janelle Coombs, P.Eng, at 519 255-6100 ext.6004 or email at jcoombs@citywindsor.ca .

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

cc: Councillor Gignac
France Isabelle-Tunks – ED of Engineering
Chrissy Jung – Stantec Consulting Ltd.

MANNING
ENVIRONMENTAL LAW

DELIVERED BY EMAIL

August 5, 2022

Janelle Coombs, P. Eng. Project Administrator City of Windsor 350 City Hall Square West, Suite 310 Windsor, ON, N9A 6S1 Email: *jcoombs@citywindsor.ca*	Jian Li, Ph.D., P. Eng. Project Manager Stantec Consulting Ltd. 2555, Ouelette Avenue, Suite 100 Windsor, ON N8X 1L9 Email: *jian.li@stantec.com*

Dear Ms. Coombs and M. Li,

RE: City of Windsor St. Rose Stormwater Pumping Station Municpal Class Environmental Assessment ("MCEA") – Phases 3 and 4 – Public Information Centre No. 2 ("PIC No. 2") – Responding Comments of [redacted]

We are environmental legal counsel for [redacted]

We write with [redacted] comments in response to the [redacted]ne 23, 2022 for the St. Rose Stormwater Pumping Station, initially pr[redacted] Flood Protection Master Plan Report dated November 2020 ("[redacted]").

In particular, this letter responds to the City's selection of St. Rose Beach Park greenspace (the "Park") as the preferred location for a new pumping station ("Pumping Station"). The City relies in that selection on the Comparative Evaluation of Site Location Report prepared for the City by Stantec Consulting Ltd. in May 2022 (the "Stantec Report").

The City's Selection Is Tainted By Confirmation Bias

The City made up its mind to select the Park as the preferred site location for the Pumping Station in advance of the comparative site location evaluation proposed by the Stantec Report.

The selection of the of the Park is therefore irredeemably tainted by confirmation bias, the tendency to reach conclusions that confirm an existing choice or belief.

The initial Master Plan site location evaluation was premature

The Master Plan included a comparative site location evaluation of four alternative locations identified as potentially suitable for the new Pumping Station (“Master Plan Site Location Evaluation”).

The Master Plan purported to select the Park as the preferred location for the Pumping Station. [redacted].

As discussed below, the Master Plan Site Location Evaluation was premature and should have waited for the current Phase 3 of the MCEA.

On January 25, 2021 we wrote to the City with [redacted] submission reponding to the City’s Notice of Completion of the Master Plan. We wrote again to the City on March 25, 2022 in response to the City’s commencement of the MCEA Phases 3 and 4 and its PIC No. 1.

In both letters, [redacted] objected to the choice of the Park as the preferred location for a new “Rose Park” pumping station (“Rose Park Pumping Station”)

In particular, the letters noted that the City had conflated the selection of the preferred “solution” with the selection of the preferred “location”.

In this project, the preferred “solution” identified by the [redacted]as construction of a new pumping station. The preferred “so[redacted]hase 2 of the MCEA but the consideration of the preferred “location” still remained to be studied[redacted]d consulted upon under the current MCEA Phase 3.

The City selected the Park for the Pumping Station to suit its convenience and pocketbook at the expense of community and other long term interests.

[redacted]

The Master Plan Report based its choice of the Park (Alternative 1) primarily on criteria related to constructability, and cost[1] notwithtanding that: [redacted]

> [2]*Alternative 1 will result in the greatest permanent change to the local urban community due to the greater impact to the St. Rose Ave. Park land. Within the City, and especially in the Riverside Area, waterfront access is limited and is only available through the presence of City owned park lands. Placing the pumping station within the St. Rose Ave.*

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[1] Para.6.7.1.7.4 of the Master Plan Report – Summary at p.268 second para.

[2] Para.6.7.1.7.4 of the Master Plan Report – Permanent Changes to the Urban Community at p.266

> *Park (Alternative1) will limit the use of most of the east portion of the Beach (east of the pier/walkway). Alternatives 2, 3, and 4 will require the installation of an outlet chamber within the park which will have less impact to the park land use.*
>
> *In addition to the significant change to the park use, the existing waterfront view will be compromised. The existing waterfront and Detroit River views are valuable to adjacent homeowners as well as the local community.The placement of this pumping station will have impacts to those that live adjacent or across from the park as it will partially impact the existing view of the river and Detroit city skyline. Alternative 2, 3, and 4 is preferred with respect to the impacts to waterfront view and park impacts as Alternative 1 will have the most permanent impact.*

In so doing he City yielded to the temptation to place too much weight on short-term and fiscal considerations and undervalued the acknowleged adverse long-term community and other impacts of locating the Pumping Station at the Park.

The selection of the Park is tainted by confirmation bias to endorse the Master Plan selection.

Our letter of March 25, 2022 expressed concern that the City's presentation at PIC No. 2 identified the Park as the preferred location despite the fact that the Phase 3 site location evaluation had not been completed. (The Stantec Report i[redacted]

In other words, the City had presumed at the start of Phas[redacted]tantec evaluation would endorse the site location selection that [redacted] prematurely made by the Masterplan. [redacted]

The Stantec Report of May 2022 purports to carry out a detailed comparative evaluation of the same four alternatives. It also selects the Park as the preferred location,

It is impossible to escape the conclusion that the site selection process has been irredeema[redacted] tainted by confirmation bias, the tendency to reach conclusions that confirm an existing choice or belief. [redacted]

The Stantec Report Is Flawed

The Stantec Report:

- Relies on fundamentally incorrect assumptions that no acquisition cost or delay in implementation need be attributed to the Park.

- Contains contradictions in its analysis of Noise and Vibration Impacts and Generator Emissions Impacts.
- Is weighted in favour of technical and economic issues and to the disbenefit of environmental and social issues.

[redacted] submits that the evaluation in the Stantec Report is unbalanced and results in an unfair conclusion.

The Park is not a cost-free option for the City.

The Stantec Report assumes that the Park is owned by the City "and would not require any property acquisition"[3] whereas the other alternative locations require acquisition of various properties with the attendant delays and cost of expropriation.

The Stantec Report notes that *"historic restrictive covenant in the deed for the property which indicates buildings or motor vehicles are not permitted on the property."* but goes on to say: *"While this restrictive covenant is deemed expired under the Land Titles Act as it has been registered to the property for over forty (40) years, it should be removed from title to be utilized for the proposed pumping station."*[4]

The Stantec Report infers from this that there will be no [redacted]ark in contrast to the other alternatives where, the Stantec Repo[redacted] to acquire/expropriate two or more properties in each case. [redacted]ort concludes that the Park is the best choice ("very good") for relative capital cost.[5]

The Stantec Report conclusions are based on a false premise. It is far from clear that the forty years expiry of the restrictive covenant impose by the Land Titles Act applied retrospectively to the restrictive covenant on the Park.

Even if it did, the transfer of title for the express purpose of a park beneficial to the comm[redacted]y creates a charitable purpose trust that cannot be unilaterally terminated by the municipality.

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[3] Stantec Report section 3.2.1.5
[4] Stantec Report Section 3.2.2.3 – Development Polices
[5] Stantec Report Section 3.2.4.1 – Relative Capital Cost

50% of the Park would be lost through construction of the pumping station. It would be unlawful for the City to develop the Pumping Station at the Park either by virtue of the restrictive covenant or the charitable purpose trust.[6]

Even if the City were able to overcome these restrictions through acquisition or expropriation, that would involve significant cost and delay that are not accounted for in Stantec's present analysis which assumes:

- The length of time for implementation would not be delayed by the need to acquire property because the City owns the Park. [7]
- No acquisition cost is attributed to the Park.[8]

The comparative analysis in the Stantec Report is therefore incomplete and unreliable.

The Stantec Report relies on constructability and cost issues to the detriment of social, environmental, and other long-term issues.

As was the case for the Master Plan Site Location Evaluation, the Stantec Report bases its choice of the Park (Alternative 1) primarily on criteria related to constructability and cost.

Fourteen of the 23 criteria analsyed by the Stantec Report [redacted] omic criteria (in which we include "Better Use of Existing Infr [redacted] eal with social and natural environment critieria. Yet each of these [redacted] al numerical weight (out of a total of 4).

[redacted]

Not only is the numerical count slanted in favour of technical and economic issues but the issues themselves should not be treated equally. We submit that the social and environmental issues should be given greater weight than the technical and economic issues.

While it is understandable that the City wants to select what appears to be the easiest and [redacted] expensive option, it should not do so to the detriment of social, environmental and other long-term issues. [redacted]

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[6] Stantec Report Section 3.2.2.4 – Permanent Changes to Urban Community – Disruption to Waterfront Parklands - "*The construction of the pumping chambers and other equipment will occupy approximately 50 % of the St. Rose Beach Park*".
[7] Stantec Report Section 3.2.1.5 – Time Required for Completion.
[8] Stantec Report Section 3.2.4.1 – Relative Capital Cost.

The Stantec Report appears to have lost sight of the purpose of the statute under which the MCEA operates, namely "the protection, conservation and wise management in Ontario of the environment."[9]

We note that, in selecting the Park as the preferred option, the Stantec Report is choosing the worst option for coastal flood risk[10] compliance with development policies[11], disruption to waterfront parklands[12], and disruption to waterfront views[13]

It is particularly perverse that in a project designed to mitigate risk of basement, surface and **coastal flooding[14]** [*Emphasis added]*, the Stantec Report selects the Park which is located outside (i.e., not protected by) the proposed landform barrier (berm) along Riverside Drive East, designed to protect against coastal flooding.

We also note the following contradictions in the Stantec Report.

The Park (Alternative 1) was rated as the best choice ("very good") for Noise and Vibration Impacts because "the generator and the pumping structure will be located at a minimum of approximately 50 meters from the nearest residents. Whereas for Alternative No.'s 2, 3, and 4, the generator and the pumping structure will be located at a minimum of approximately 30 meters."[15] However, the City's presentation at PIC No. 2 recommended Site Layout Option 3, located immediately adjacent to 7010 Riverside, and cert[redacted] or even 30 m.

The Park (Alternative 1) was also rated as the best choice [redacted] Emission Impacts because "the generator will be located farther from the nearest residents."[16] Ag[redacted]

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[9] *S. 3 Environmental Assessment Act, RSO 1990, c E.18*

[10] Stantec Report Section 3.2.1.2 – Coastal Flood Risk - "*Alternative No. 1 would be located inside of the existing Detroit River break wall barrier but outside of the proposed landform barrier; therefore, this location is at* [redacted] *risk for coastal flooding.*"

[11] Stantec Report Section 3.2.2.3 – Development Policies - "*Alternative No 1 would… impact the view of the Detroit River at the St. Rose Beach Park…involve a reduction in some of the*[redacted]*Rose Beach Park … require a zoning by-law amendment to permit a pumping station at this location.*"

[12] Stantec Report Section 3.2.2.4 – Permanent Changes to Urban Community – Disruption to Waterfront Parklands - "*The construction of the pumping chambers and other equipment will occupy approximately 50 % of the St. Rose Beach Park*".

[13] Stantec Report Section 3.2.2.4 – Permanent Changes to Urban Community – Disruption to Waterfront Views - "*The construction of the pumping chambers and other equipment will block a portion of the riverfront view at the St. Rose Beach Park*".

[14] Master Plan – section 1.2 – Project Objectives,

[15] Stantec Report Section 3.2.2.4 – Permanent Changes to Urban Community – Noise and Vibration Impacts

[16] Stantec Report Section 3.2.2.4 – Permanent Changes to Urban Community – Generator Emission Impacts

however, the recommended Layout Option No. 3 includes an above-grade generator located immediately adjacent to 7010 Riverside.

Both the evaluation criteria and scoring in the Stantec Report should be reevaluated.

[redacted] therefor submits that the evaluation in the Stantec Report is unbalanced and results in an unfair conclusion.

Should the City Still Select the Park

If notwithstanding the arguments in this letter, the City should persist with the selection of the Park, [redacted] proposes (without prejudice to or limitation upon any of those arguments or [redacted] position generally) the following towards mitigation of the impact of that selection.

The City's forthcoming Environmental Study Report pursuant to the MCEA process should include conditions and commitments requiring the following:

- Objectives of design and construction of the Pumping Station to include (but not by way of limitation)
    - Constructing buildings and structures including (and where possible concealed by) landscaping to blend in with the use, look and amenity of the Park as parkland.
    - Minimal exposure of structures to reduce or eliminate the visual impact on the sight lines and ambience of the current Park.
    - Least adverse impact on the use, occupation, amenity and enjoyment of [redacted] and those of other affected neighbours (together, the "Affected Parties") during the construction, maintenance and long-term operation and use of the Pumping Station.
    - Landscaping to include, mature tree and hedge barriers along the boundary of the Park [redacted] of sufficient height and depth to shield the view [redacted] of Pumping Station buildings and structures, but without restricting parkland and river views [redacted] (the "Tree and Hedge Landscaping").
    - All construction and maintenance to be carried out in winter months, where practicable.

- Ongoing substantive consultation by the City with the Affected Parties, and reasonable accommodation of their requirements, whether individually or as a group, on all issues of preliminary and detailed design and construction of the Pumping Station. Such consultation shall include but not be limited to the location of the Pumping Station on the Park, the placement and design of the building, generator and any ancillary structures.

- No buildings or structures shall exceed 8 feet above current ground level of the Park or be located less than 75 feet from the river's edge

- The City shall install and maintain in perpetuity the Tree and Hedge Landscaping.

[redacted] name, address and any other personal information must be redacted in the Environmental Study Report and any documentation (including but not limited to this correspondence) which is included in that Report or otherwise made publicly available.

Please do not hesitate to contact us if anything in this submission requires clarification or further discussion.

Yours sincerely,

[redacted]

[redacted]

[redacted]

[redacted]

Office of the Commissioner of Infrastructure Services

September 16, 2022

[redacted]

Dear [redacted]

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment. We write in response to your letter, which was received by email on August 5th, 2022.

Comment No. 1: The City's Selection Is Tainted By Confirmation Bias.

As outlined in our previous communications, the outcome of the comparative site evaluation set out in the Comparative Evaluation of Site Location Report dated May 2022 ("Stantec Report") was not predetermined. Based on feedback received in response to the November 2020 Sewer and Coastal Flood Protection Master Plan (SMP), the City of Windsor pursued an in-depth analysis of the four alternative locations by a separate consultant based on environmental assessment principles and industry standard practices. The evaluation criteria used in this analysis were developed based on those outlined in the SMP with additional criteria to incorporate considerations heard through consultation on the Master Plan. The evaluation outlined in the Stantec Report is both traceable and transparent with discussion around the scoring for each criterion and was not predetermined by the preceding SMP work.

The evaluation overview and preferred Site Alternative presented at the March 2 Public Information Center (PIC 1) was a summary of the results of the technical evaluation of alternative sites in the Stantec Report. While the evaluation was complete at this time, the Stantec Report remained in draft form until May to allow time for review and consideration of public feedback and comments from the PIC before finalizing. The technical information presented at the PIC and included in the finalized Stantec Report, remained consistent. The May 2022 date is merely a reflection of the finalization of the Stantec Report, rather than an indication the Phase 3 evaluation had not been completed.

Comment No. 2: The Stantec Report Is Flawed: Relies on fundamentally incorrect assumptions that no acquisition cost or delay in implementation need be attributed to the Park.

The Stantec Report evaluation did not conclude there was no delay in implementation associated with Site Alternative 1. The factors that were considered as having a meaningful impact on time required for implementation of all Site Alternatives, are evaluated under section 3.2.1.5 of the Stantec Report.

The assumption that there is no direct capital cost for property acquisition at Site Alternative 1 is a fair and accurate assumption for this phase of the Municipal Class EA since as the St. Rose Beach Park land is owned by the City of Windsor. Under the criterion "Relative Capital Cost" a preliminary cost analysis for each Site Alternative was carried out to evaluate each Site Alternative's associated projected capital costs (Table 3-2 of the Stantec Report summarizes the results of this analysis). None of the Site Alternatives were assigned a numerical cost value for a property acquisition component and the capital costs for the project were estimated to be the lowest for Alternative 1. Additional costs that may be attributed to the need to acquire property were represented with a '+'.

Comment No. 3: The Stantec Report is Flawed: Contains contradictions in its analysis of Noise and Vibration Impacts and Generator Emissions Impacts

In the Stantec Report, Section 3.2.2.4: Permanent Changes to Urban Community 'Noise and Vibration Impacts' and 'Generator Emission Impacts' will be updated to ensure consistency with the design concepts presented at PIC 2.

Based on the updated site layout presented at the second PIC, the distance between the generator and the nearest residence will be approximately equal for all four site alternatives. Proposed Site Alternative 1 will be adjacent to one residential property on the east, across Riverside Drive from residential properties to the south, adjacent to the Detroit River to the north and a natural embayment to the west. Site Alternatives 2 and 3 will be adjacent to two residential properties on the south and east/west, across St. Rose Avenue from residential properties on the west/east, and across Riverside Drive from the Detroit River and St. Rose Park on the north. Site Alternative No. 4 will be adjacent to one residential property on the north, one commercial property west, across St. Rose Avenue from one residential and one commercial property on the east, and across Wyandotte Street from an institutional greenspace (St. Rose Catholic Elementary School) on the south. Based on the distance, degree of impact, and land use in the areas surrounding the four sites, the overall scoring within these categories will not change.

The proposed pumping station will be designed in accordance with stringent sound attenuation requirements and generator emission regulations of the Ontario Ministry of Environment, Conservation, and Parks (MECP). This will ensure the appropriate engineering control measures are in place to minimize noise, vibration, and other emissions to the surrounding neighbourhood. The noise and vibrations produced by the pumps in the wet well structure will be minimized by properly designing the foundation structure. The noise and vibrations caused by the generator will be minimized by properly designing the generator foundation structure, ensuring proper installation and alignment, noise enclosures, landscape or fencing buffers and/or other mitigation measures. The emissions caused by the generator will be minimized through appropriate design of the generator exhaust system, ensuring a regular maintenance and servicing schedule, providing landscaping, or fencing buffers and/or other mitigation methods.

Comment No. 4: The Stantec Report is Flawed: Is weighted in favour of technical and economic issues and to the disbenefit of environmental and social issues

As described in the Stantec Report, a list of criteria was developed to allow for a fulsome evaluation of the potential short and long-term effects on the environment (including technical, natural environmental, social and economic). The results from the Stantec Report represent a balanced approach to determining the preferred location for the proposed pumping station. The preferred Site Alternative was determined based on overall net effects on the environment at each location considering short-term impacts, long-term impacts and potential mitigation options.

Thank you for your comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment. The proposed pumping station is a significant part of a City-wide solution to widespread flooding concerns and is necessary to protect residents from extreme weather events.

We will continue to consider your comments as the study progress and they will be included in the Environmental Study Report (ESR). As requested, [redacted] name, address, and other personal information will be redacted in the ESR and any other documentation made publicly available. The City has noted [redacted] desire to take part in the consultation process regarding the final design of the proposed St. Rose Stormwater Pumping Station (without prejudice to or limitation upon any of those arguments or his position generally). We anticipate posting the ESR for public review later this year. A notice of the public review period will be sent to all interested residents and stakeholders to participate and provide feedback at that time.

Sincerely,

Chris Nepszy, P. Eng. PE
Commissioner, Infrastructure Services

cc: Councillor Gignac
France Isabelle-Tunks – ED of Engineering
Chrissy Jung – Stantec Consulting Ltd.

DELIVERED BY EMAIL

October 24, 2022

Chris Nepszy, P. Eng., PE
Commissioner, Infrastructure Services
City of Windsor
350 City Hall Square West, Suite 310
Windsor, ON N9A 6S1
Email: *c/o* jcoombs@citywindsor.ca

Dear Mr. Nepszky,

RE: City of Windsor St. Rose Stormwater Pumping Station
Municpal Class Environmental Assessment ("MCEA")

Thank you for your letter of September 16 (received by email September 20, 2022) responding to the comments in our letter of August 5, 2022. We reply on behalf of [redacted] as follows (using the same defined expressions as in that letter).

Generally: [redacted] stands by the comments in our letter and [redacted] position is reserved.

Subject thereto, we reply as follows to the specific points raised in your letter.

Comment No 1 – The City's Selection Is Tainted By Confirmation Bias

Your response does nothing to dispel the inference that th[redacted]he preferred location of the Pumping Station is irredeemably taintied by confirmation bias.

For the reasons set out in our letter, the Master Plan's purported evaluation of the four alternative locations and selection of the Park as the preferred location, was premature.

That exercise established a context and expectation which must have influenced Stantec's subsequent evaluation however "traceable and transparent" that exercise may have been.

The City's presentation at PIC No. 2 in March 2022 identified the Park as the preferred location despite the fact that Stantec's Phase 3 site location evaluation dated May 2022 had not been completed. We have seen nothing to support the contention in your letter that Stantec had completed its evaluation before then.

Comment No. 2 – The Stantec Report Is Flawed: Relies on fundamentally incorrect assumptions that no acquisition cost or delay in implementation need be attributed to the Park.

Your response sidesteps the specific points in our letter that (even assuming that the Park is legally capable of being used for the Pumping Station) the restrictive covenant on the Park will result in delay in and costs of implementation, contrary to the assumptions in the Stantec Report.

The suggestion in your letter that "there is no direct capital cost" does not answer this objection.

The Stantec Report's conclusion that the Park is the best choice ("very good") for relative capital cost is therefore flawed.

Comment No. 3 – The Stantec Report Is Flawed: Contains contradictions in its analysis of Noise and Vibration Impacts and Generator Emissions Impacts

We note that you acknowledge that the Stantec Report was not consistent with the PIC No. 2 Presentation and that this will be corrected (presumably in the final EA report). However, contrary to your suggestion, this must surely result in changes to the scoring in the comparative site evaluation.

If, as you say in your letter, the distance between generator and nearest residence in the PIC No. 2 site layout is approximately equal for all four sites, it is difficult to see how the Park should be scored 4 (best) and the other sites only 2 or 3.

Comment No. 4: The Stantec Report is Flawed: Is weighted in favour of technical and economic issues and to the disbenefit of environmenta[redacted]

Your response is a general one, that does not respond to the specific points in our letter, not least our comments that:

> "In selecting the Park as the preferred option, the Stantec Report is choosing the worst option for coastal flood risk compliance with development policies, disruption to waterfront parklands and disruption to waterfront views"

and that

> "…[perversely] in a project designed to mitigate risk of basement, surface and **coastal flooding** [*Emphasis added]*, the Stantec Report selects the Park which is located outside

(i.e., not protected by) the proposed landform barrier (berm) along Riverside Drive East, designed to protect against coastal flooding."

For reasons set out in our letter of August 5 and in this letter, we disagree with your suggestion that, "the results from the Stantec Report represent a balanced approach to determining the preferred location for the proposed pumping station."

Should the City Still Select the Park

Your reply does not address the detail of [redacted] without prejudice mitigation proposals should the City persist in its selection of the Park as the preferred location for the Pumping Station.

For the avoidance of doubt, in that circumstance [redacted] proposes that any such commitments by the City be explicitly included as part of the final EA report.

Please do not hesitate to contact us if anything in this submission requires clarification or further discussion.

[redacted]

[redacted]

[redacted]

cc. J. Coombs

Office of the Commissioner of Infrastructure Services

DELIVERED BY EMAIL ONLY

January 19, 2023

[redacted]

Dear [redacted],

We write in response to your most recent letter dated October 24, 2022.

Thank you for your additional comments regarding the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment (MCEA).

The City's response is the same as in our previous correspondence. The concerns raised have been reviewed and considered in the finalization of the MCEA and the appropriate updates will be documented in the Environmental Study Report (ESR).

[redacted] has reached out directly to the City and expressed a desire to take part in the consultation process regarding the conceptual design and potential mitigation steps in connection with the St. Rose Stormwater Pumping Station. Preliminary discussions with [redacted] have already taken place. The comments received from [redacted] will be addressed in the ESR document for future planning, and specific mitigation measures will be further considered during the detailed design phase of the project.

We anticipate posting the ESR for public review shortly. A notice of the public review period will be sent to all interested residents and stakeholders to participate and provide feedback at that time.

Regards,

Chris Nepszy, P.Eng., PE
Commissioner, Infrastructure Services

cc: Councillor Gignac, Ward 6
Colleen Middaugh, Manager of Corporate Projects
Shelby Askin Hager, Commissioner, Legal & Legislative Services
Wira Vendrasco, Deputy City Solicitor, Legal & Real Estate Services
France Isabelle-Tunks, P.Eng, Executive Director of Engineering/Deputy City Engineer

APPENDIX C

Response from Review Agencies – Notice of Draft ESR

From:	Telus Utility Markups
To:	Jung, Chrissy
Subject:	RE: 165620239: Notice of Draft Environmental Study Report - Class EA St. Rose Stormwater Pumping Station, City of Windsor, Ontario Telus 2023 - 1142
Date:	Friday, February 24, 2023 11:49:51 AM

Hello,

TELUS has no underground infrastructure in the area of your proposed work

Thank you,

Meghna Patel

Permit Coordinator
Coordinateur de permis

T (905) 569-2882 x1352
7777 Weston Road, Vaughan, ON L4L 0G9

telecon.com

From: Jung, Chrissy <Chrissy.Jung@stantec.com>
Sent: Thursday, February 23, 2023 3:25 PM
Subject: 165620239: Notice of Draft Environmental Study Report - Class EA St. Rose Stormwater Pumping Station, City of Windsor, Ontario

To Whom it May Concern,

The City of Windsor is undertaking a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the proposed St. Rose Pumping Station. The City of Windsor endorsed its first comprehensive Sewer and Coastal Flood Protection Master Plan (SMP) in 2020. The SMP was completed in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment process. It outlined that a new stormwater pumping station is required to discharge excess water during major storm events in the expanded St. Rose drainage area. This study will satisfy Phases 3 and 4 of the Class EA process which will involve the evaluation of the site location, site alternatives and design concept alternatives for the proposed St. Rose Stormwater Pumping Station. This "Draft" Environmental Study Report was prepared to document the activities and recommendations from the Class EA process.

Your agency is invited to submit comments on the "Draft" Environmental Study Report. In an effort to conserve paper and reduce printing costs, the report is being distributed in electronic format. Please use the following link and login information to access the report:
Login Information
FTP link: https://tmpsftp.stantec.com
Login name: s0302125843
Password: 3884153
Disk Quota: 20 GB
NEW Expiry Date: 3/9/2023
This file sharing service will expire on March 9th, 2023, if you require access after this date, please contact the undersigned.

Additional project details are available on the City Webpage: St. Rose Stormwater Pumping Station Environmental Assessment (citywindsor.ca).

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 March 16th, 2023.

Sincerely,

Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From:	Jung, Chrissy
To:	Horrobin, Barry
Cc:	Coombs, Janelle; cmiddaugh@citywindsor.ca; Li, Jian
Subject:	RE: Windsor Police comments: 165620239: Notice of Draft Environmental Study Report - Class EA St. Rose Stormwater Pumping Station, City of Windsor, Ontario
Date:	Monday, February 27, 2023 11:07:00 AM

Hello Barry,

Thank you for your email. We appreciate your comments regarding the safety and security of the proposed pumping station.
Your comments will be included in the Environmental Study Report (ESR) and will be further considered during the implementation phase of this project.

Thank You,
Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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From: Horrobin, Barry <bhorrobin@windsorpolice.ca>
Sent: Friday, February 24, 2023 5:13 PM
To: Jung, Chrissy <Chrissy.Jung@stantec.com>
Subject: Windsor Police comments: 165620239: Notice of Draft Environmental Study Report - Class EA St. Rose Stormwater Pumping Station, City of Windsor, Ontario

Chrissy:

Thank you for sending this notice for the draft Environmental Study report pertaining to the St. Rose Pumping Station. This results from this study are not anticipated to carry any significant impact to public safety in a way that is overtly discernible, however I would offer the following feedback at this stage of the process:

- The primary issue, while low in overall risk probability, is to ensure the property is established and maintained in a way that optimizes physical security. This is because of the high importance associated with this asset, when required. In this regard, failure of its functioning should unlawful access be gained, would be detrimental. Criminal access that leads to possible acts of sabotage needs to be prevented. In saying this, extra care should be given to solidifying good access control measures into the site, plus implementing important target hardening features such as, but not limited to:
    - High resolution CCTV recording of activity on and around the property, with a minimum image retention capability of 30 days.

    Use of high security hardware to effectively fortify access into any building structures.
    - Installing a good quality security access control system that can quickly detect the presence of illegal access by unauthorized individuals.
    - Excellent lighting to optimize natural surveillance capability and also facilitate more effective police response if called to the site. Minimum illumination levels would vary according to various parts of the site and would be provided if a final site plan was provided to Windsor Police for review (Recommended). In general, full cut off LED lighting is recommended that uses fixtures with a colour temperature of 4000 degrees Kelvin (4000K) and a corresponding minimum colour rendering index (CRI) of 70. There may also be areas where motion-activated floodlighting is more appropriate – this can be confirmed during a site plan review.

- It is also important that uninhibited access by all emergency responders (Police, Fire, and EMS) be achieved as an outcome from the final design, when it is constructed and made operational.

I will be happy to comment further on this project as it progresses to later stages, most notably the point at which a finalized site plan of all works to be undertaken gets developed.

Respectfully,

Barry Horrobin, B.A., M.A., CLEP, CMM-III
Director of Planning & Physical Resources
WINDSOR POLICE SERVICE
IALEP INTERNATIONAL ASSOCIATION OF LAW ENFORCEMENT PLANNERS
Advanced Certified Law Enforcement Planner

From: Jung, Chrissy <Chrissy.Jung@stantec.com>
Sent: Thursday, February 23, 2023 3:20 PM
Subject: 165620239: Notice of Draft Environmental Study Report - Class EA St. Rose Stormwater Pumping Station, City of Windsor, Ontario

EXTERNAL EMAIL: Do not click any links or open any attachments unless you trust the sender and know the content is safe. The Original Sender of this email is "Jung, Chrissy" <Chrissy.Jung@stantec.com>

To Whom it May Concern,

The City of Windsor is undertaking a Schedule ‘C’ Municipal Class Environmental Assessment (Class EA) for the proposed St. Rose Pumping Station. The City of Windsor endorsed its first comprehensive Sewer and Coastal Flood Protection Master Plan (SMP) in 2020. The SMP was completed in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment process. It outlined that a new stormwater pumping station is required to discharge excess water during major storm events in the expanded St. Rose drainage area. This study will satisfy Phases 3 and 4 of the Class EA process which will involve the evaluation of the site location, site alternatives and design concept alternatives for the proposed St. Rose Stormwater Pumping Station. This “Draft” Environmental Study Report was prepared to document the activities and recommendations from the Class EA process.

Your agency is invited to submit comments on the “Draft” Environmental Study Report. In an effort to conserve paper and reduce printing costs, the report is being distributed in electronic format. Please use the following link and login information to access the report:
Login Information
FTP link: https://tmpsftp.stantec.com
Login name: s0302125843
Password: 3884153
Disk Quota: 20 GB
NEW Expiry Date: 3/9/2023
This file sharing service will expire on March 9th, 2023, if you require access after this date, please contact the undersigned.

Additional project details are available on the City Webpage: St. Rose Stormwater Pumping Station Environmental Assessment (citywindsor.ca).

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 March 16th, 2023.

Sincerely,
Chrissy Jung M.A.Sc., E.I.T.
Process Environmental Engineering Intern

Chrissy.Jung@stantec.com

Stantec
100-2555 Ouellette Avenue
Windsor ON N8X 1L9

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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

March 14, 2023 VIA EMAIL ONLY

Janelle Coombs, P. Eng.
Project Administrator, City of Windsor
350 City Hall Square West, Suite 310
Windsor, ON N9A 6S1
jcoombs@citywindsor.ca

MCM File	:	**0016075**
Proponent	:	**City of Windsor**
Subject	:	**Municipal Class EA – Schedule B - Notice of Draft Environmental Study Report**
Project	:	**St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment**
Location	:	**City of Windsor**

Dear Janelle Coombs:

Thank you for making the St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment – Environmental Study Report (ESR) (dated February 13, 2023, prepared by Stantec) available for our review and comment.

Ministry of Citizenship and Multiculturalism's (MCM) interest in this Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage.

Project Summary
The City of Windsor is undertaking a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the proposed St. Rose Pumping Station. The City of Windsor endorsed its first comprehensive Sewer and Coastal Flood Protection Master Plan (SMP) in 2020. The SMP was completed in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment process. It outlined that a new stormwater pumping station is required to discharge excess water during major storm events in the expanded St. Rose drainage area. This study will satisfy Phases 3 and 4 of the Class EA process which will involve the evaluation of the site location, site alternatives and design concept alternatives for the proposed St. Rose Stormwater Pumping Station.

Comments

MCM finds that due diligence has been undertaken in preparing the above-referenced ESR by:

- undertaking a Stage 2 archaeological assessment (AA) (under Project Information Form (PIF) number P256-0697-2021, included in Appendix D) which has been entered into the public register of archaeological reports indicating no further archaeological assessment of the study area is required.
- completing the checklist Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes (included in Appendix D), which determined that potential is low and therefore no cultural heritage evaluation and/or heritage impact assessment was undertaken.

We have attached a table with some comments to support the ESRs documentation of cultural heritage due diligence.

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 consulting MCM 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
Heritage Planning Unit
joseph.harvey@Ontario.ca

Copied to: Jian Li, Project Manage, Stantec Consulting,
Chrissy Jung, Process Environmental Engineering Intern, Stantec Consulting

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*.

ESR Section	Original Text	Comment
2.5.4 (Archaeological Potential) & 2.5.5 (Built Heritage and Cultural Heritage Landscapes) p. 19	2.5.4 Archaeological Potential Windsor is an area rich in cultural heritage resources and diversified cultural traditions. The areas along the Detroit River are ones with high cultural and historical significance. Figure 2.1 of Appendix A shows a map, taken from the City's Archaeological Master Plan (2005), identifying areas with high archaeological potential, which typically require archaeological assessments. The map identifies St. Rose Beach Park as an area containing high archaeological potential. This will be further discussed in Section 6.3.2. 2.5.5 Built Heritage and Cultural Heritage Landscapes The heritage resources around the proposed work area were identified based on the Windsor Municipal Heritage Register provided by the City of Windsor. The City of Windsor's Planning and Building Services Department was also consulted to determine the location and details of Built Heritage and Cultural Heritage Landscapes. The proposed St. Rose drainage area includes several dozen properties identified on the Windsor Municipal Heritage Register. This will be further considered in Section 6.3.1.	ESR sections 2.5.4 and 2.5.5 should be revised to better reflect current legislation and terminology: 2.5.4 Cultural Heritage Environment: Cultural heritage resources include archaeological resources, built heritage resources and cultural heritage landscapes. 2.5.4.**1** Archaeological ~~Potential~~ **Resources** Windsor is an area rich in cultural heritage resources and diversified cultural traditions. The areas along the Detroit River are ones with high cultural and historical significance. Figure 2.1 of Appendix A shows a map, taken from the City's Archaeological Master Plan (2005), identifying areas with high archaeological potential, which typically require archaeological assessments. The map identifies St. Rose Beach Park as an area containing high archaeological potential. ~~This will be further discussed in Section 6.3.2.~~ A Stage 2 archaeological assessment (AA) (under Project Information Form number P256-0697-2021 (s)) was undertaken on July 6, 2022 by Stantec Consulting Ltd. A Stage 2 AA consists of a site visit, where a consultant archaeologist will conduct a general survey of the whole property to identify all archaeological resources that may be present. The survey consists of walking a ploughed field looking for artifacts lying on the surface of the ground or test pitting unploughable areas at regular intervals and screening the soil for artifacts. Its purpose is to identify areas of archaeological potential and recommend further archaeological assessment (e.g., Stage 3-4) as necessary. The Stage 2 AA is included in Appendix D. [Then include the outcomes and recommendations of the report, as in Executive Summary]

		A marine archaeological overview was undertaken on July 5, 2022 by Stantec Consulting Ltd. The marine archaeological overview for this project is included in Appendix D. 2.5.~~4~~5.2 Built Heritage **Resources** and Cultural Heritage Landscapes ~~The heritage resources around the proposed work area were identified based on the Windsor Municipal Heritage Register provided by the City of Windsor. The City of Windsor's Planning and Building Services Department was also consulted to determine the location and details of Built Heritage and Cultural Heritage Landscapes. The proposed St. Rose drainage area includes several dozen properties identified on the Windsor Municipal Heritage Register. This will be further considered in Section 6.3.1.~~ The screening checklist, Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes, developed by the Ministry of Tourism, Culture and Sport (now MCM), was completed as part of the project file (see Appendix x). The study area was determined to have low potential for built heritage resources and cultural heritage landscapes. Therefore, no technical cultural heritage studies have been undertaken.
6.3 (Socio-Economic Impacts and Mitigation Measures) p. 66-69	6.3.1 Built heritage resources and cultural heritage landscapes There are no built heritage resources and/or cultural heritage landscapes adjacent to the pumping station site. The MTCS's "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes" checklist was completed for this project. The completed checklist included in Appendix D. The proposed work is located a safe distance from these built heritage and cultural heritage landscapes and is not expected to negatively impact heritage resources in the area.	MCM recommends the following revision to ESR section 6.3: ~~6.3.1 Built heritage resources and cultural heritage landscapes~~ ~~There are no built heritage resources and/or cultural heritage landscapes adjacent to the pumping station site. The MTCS's "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes" checklist was completed for this project. The completed checklist included in Appendix D. The proposed work is located a safe distance from these built heritage and cultural heritage landscapes and is not expected to negatively impact heritage resources in the area.~~

	The vibration limits set for the project will ensure that all buildings are protected. Monitoring during construction will ensure that vibration is kept below the established limit. 6.3.2 Archaeological Resources Windsor is an area rich in cultural heritage resources and diversified cultural traditions. Figure 2.1 of Appendix A, which is adapted from Figure 4: 'Archaeological Potential' (dated 2005) of the City of Windsor Archaeological Master Plan, shows the area as land with high archaeological potential and requiring an archaeological assessment. Fisher Archaeological Consulting (FAC) conducted an archaeological assessment for the SMP. FAC determined that the land north of Riverside Drive within the St. Rose Beach Park site was artificially created between 1975 and 2000 through a process of infilling the south shore of the Detroit River. These artificial lands hold no to low archaeological potential. The northern edge of Riverside Drive was determined to potentially represent the original shoreline of the Detroit River and therefore holds some potential for archaeological resources. Due to the potential for discovery of Aboriginal or Euro-Canadian resources it was recommended that a Stage 2 Archaeological Assessment be conducted. FAC also recommended that a marine archaeological assessment for the in-water impacts of the study area be conducted. Based on the recommendations provided in the SMP, a Stage 2 Archaeological Assessment was carried out by Stantec in 2021. The purpose of this assessment was to determine the potential for discovery of archaeological resources along the northern edge of Riverside Drive and determine if a proposed pumping station, outlet structure, and connecting stormwater sewers would have archaeological impacts. This study was	~~The vibration limits set for the project will ensure that all buildings are protected. Monitoring during construction will ensure that vibration is kept below the established limit.~~ (See suggested edits to section 2.5.4 above) 6.3.~~2~~**1** Archaeological Resources ~~Windsor is an area rich in cultural heritage resources and diversified cultural traditions. Figure 2.1 of Appendix A, which is adapted from Figure 4: 'Archaeological Potential' (dated 2005) of the City of Windsor Archaeological Master Plan, shows the area as land with high archaeological potential and requiring an archaeological assessment.~~ ~~Fisher Archaeological Consulting (FAC) conducted an archaeological assessment for the SMP. FAC determined that the land north of Riverside Drive within the St. Rose Beach Park site was artificially created between 1975 and 2000 through a process of infilling the south shore of the Detroit River. These artificial lands hold no to low archaeological potential. The northern edge of Riverside Drive was determined to potentially represent the original shoreline of the Detroit River and therefore holds some potential for archaeological resources. Due to the potential for discovery of Aboriginal or Euro-Canadian resources it was recommended that a Stage 2 Archaeological Assessment be conducted. FAC also recommended that a marine archaeological assessment for the in-water impacts of the study area be conducted.~~ ~~Based on the recommendations provided in the SMP, a Stage 2 Archaeological Assessment was carried out by Stantec in 2021. The purpose of this assessment was to determine the potential for discovery of archaeological resources along the northern edge of Riverside Drive and determine if a proposed pumping station, outlet structure, and connecting stormwater sewers would have archaeological impacts. This study was undertaken since the park is owned by the proponent and located in the area identified with archaeological potential; therefore, this~~

	undertaken since the park is owned by the proponent and located in the area identified with archaeological potential; therefore, this site was used as an indicator for the Stage 2 Archaeological Assessment. No archaeological resources were identified during the Stage 2 archaeological assessment at the site. Therefore, no further land-based archaeological assessment of the study area is required. The Stage 2 Archaeological Assessment Report was submitted by Stantec to the Ministry of Tourism, Culture and Sport (MTCS) on July 6th, 2022. A letter from the MTCS informing that this report was entered into the Ontario Public Register of Archaeological Reports was received on July 6th, 2022. This confirmation letter is included in Appendix D. A portion of the study area includes the Detroit River and construction may affect the riverbed area impacting submerged cultural resources. The Detroit River retains potential for the identification of marine archaeological resources; therefore, Stantec recommended a Marine Archaeological Overview Assessment be completed before the final design process. The archaeological assessment report for this project is included in Appendix D. A Marine Archaeological Overview Assessment (MAOA) to determine if any archaeological resources are present on the shore of the Detroit River near the study area was carried out by Stantec. The in-water or marine portion of the Project study area, the Marine Study Area, is approximately 0.3 hectares within the Detroit River. As portions of the marine study area overlap with the Detroit River, potential in-water construction components may impact potential submerged cultural resources and the marine archaeological potential of the study area is being considered. Criteria for assessing marine archaeological potential can include proximity to registered archaeological sites (terrestrial and marine), proximity to reported or registered wreck sites, proximity to active or	~~site was used as an indicator for the Stage 2 Archaeological Assessment. No archaeological resources were identified during the Stage 2 archaeological assessment at the site. Therefore, no further land-based archaeological assessment of the study area is required. The Stage 2 Archaeological Assessment Report was submitted by Stantec to the Ministry of Tourism, Culture and Sport (MTCS) on July 6th, 2022. A letter from the MTCS informing that this report was entered into the Ontario Public Register of Archaeological Reports was received on July 6th, 2022. This confirmation letter is included in Appendix D.~~ ~~A portion of the study area includes the Detroit River and construction may affect the riverbed area impacting submerged cultural resources. The Detroit River retains potential for the identification of marine archaeological resources; therefore, Stantec recommended a Marine Archaeological Overview Assessment be completed before the final design process. The archaeological assessment report for this project is included in Appendix D.~~ ~~A Marine Archaeological Overview Assessment (MAOA) to determine if any archaeological resources are present on the shore of the Detroit River near the study area was carried out by Stantec. The in-water or marine portion of the Project study area, the Marine Study Area, is approximately 0.3 hectares within the Detroit River. As portions of the marine study area overlap with the Detroit River, potential in-water construction components may impact potential submerged cultural resources and the marine archaeological potential of the study area is being considered. Criteria for assessing marine archaeological potential can include proximity to registered archaeological sites (terrestrial and marine), proximity to reported or registered wreck sites, proximity to active or historical harbours or marine terminals, proximity to watercourses and associated narrows, rapids, waterfalls, or portage routes, and also includes proximity to inundated landscapes. Due to deep and extensive river-bed disturbance from land reclamation activities, as well as a lack of any additional indicators of marine archaeological potential, it has been determined that the marine study area retains low to no potential for the identification and documentation~~

	historical harbours or marine terminals, proximity to watercourses and associated narrows, rapids, waterfalls, or portage routes, and also includes proximity to inundated landscapes. Due to deep and extensive river-bed disturbance from land reclamation activities, as well as a lack of any additional indicators of marine archaeological potential, it has been determined that the marine study area retains low to no potential for the identification and documentation of in situ Indigenous and Euro-Canadian marine archaeological resources. Therefore, no further marine archaeological work is required for the study area. The MAOA report for this project is included in Appendix D. The MAOA report was submitted to the MTCS on July 5th, 2022. Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with 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 notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services. Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license. …	~~of in situ Indigenous and Euro-Canadian marine archaeological resources. Therefore, no further marine archaeological work is required for the study area. The MAOA report for this project is included in Appendix D. The MAOA report was submitted to the MTCS on July 5th, 2022.~~ 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 ~~and the Registrar of Cemeteries at the Ministry of Government and Consumer Services. Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.~~ 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*

Stantec Consulting Ltd.
140 Ouellette Place, Unit 140
Windsor ON N8X 1L9

March 15, 2023
File: 165620239

Attention: Mr. Joseph Harvey, Heritage Planner

Ministry of Citizenship and Multiculturalism
400 University Avenue, 5th Floor
Toronto ON, M7A 2R9

Dear Mr. Harvey,

Reference: MCM File No. 0016075
Municipal Class Environmental Assessment, Notice of Draft ESR
– St. Rose Stormwater Pumping Station, City of Windsor

Thank you for your prompt response to the February 23, 2023, Draft Environmental Study Report (ESR) for St. Rose Stormwater Pumping Station, City of Windsor. Please note that ESR **Sections 2.5.4**, **2.5.5**, and **6.3** will be updated to reflect the comments provided in your letter of March 14, 2023.

We acknowledge 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).

Stantec Consulting Ltd.

Chrissy Jung

Chrissy Jung M.A.Sc., E.I.T.
Environmental Engineer in Training
Phone: 519 966 2250 ext. 322
chrissy.jung@stantec.com

Jian Li Ph.D., P.Eng., PE
Project Manager
Phone: 519 966 2250 ext. 240
jian.li@stantec.com

c. Ms. Janelle Coombs, Project Administrator, City of Windsor
Ms. Karla Barboza, Team Lead – Heritage Planning Unit, MCM

Ontario

Ministry of the Environment, Conservation and Parks

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Environmental Assessment Branch

Direction des évaluations environnementales

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Via E-mail Only

March 22, 2023

Chrissy Jung
Process Environmental Engineering Intern
Stantec
chrissy.jung@stantec.com

Re: St. Rose Stormwater Pumping Station
City of Windsor
Municipal Class Environmental Assessment – Schedule C
Project Review Unit Comments – Draft Environmental Study Report

Dear Chrissy Jung,

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 increase storm protection in the expanded St. Rose drainage area, the City of Windsor (the proponent) has determined that the preferred design for a new stormwater pumping station is an axial flow pump system in a modern-residential architectural style building aligned with the eastern property line of the preferred location. The Ministry of the Environment, Conservation and Parks (ministry) provides the following comments for your consideration.

Indigenous Consultation

1) Appendix C of the ESR indicates that Caldwell First Nation had requested a Fieldwork Participation Agreement and Technical Review Agreement, and that the proponent would not be able to provide funding for the review of the Class EA documents. However, it is not clear if the proponent made any commitments with respect to the fieldwork portion of the community's request. Please clarify the outcome of this request for a Fieldwork Participation Agreement.

2) The proponent should continue to engage with all communities that have been engaged with to date as the Class EA process proceeds.

Soil, Sediment and Brownfields

3) Table 6.1 in section 6.1 of the ESR describes that a potential effect of the project includes, "*Possible need to remove contaminated excavated material*" that would require the mitigating measure "*Sample material*", and that another mitigating measure of soil erosion is, "*Collect contaminated runoff*", but no context is provided for these effects or measures. Also, although a Preliminary Soil Characterization Report is included in Appendix D of the ESR, the main body of the ESR is missing information on the characterization of soil at the preferred location. The ministry recommends revising the ESR to include an explanation of any pertinent results of the Preliminary Soil Characterization Report, and how the outcomes of that study impact the potential effects of the preferred alternatives and the recommended mitigation measures presented in Table 6.1. The ESR should confirm that the soil and sediment conditions do not represent a hazard to human health or to the ecosystem.

Surface Water

4) It is likely that the proposed pumping station will have to be identified in an amended Environmental Compliance Approval (ECA) for the works. Potential ECA requirements should be identified in the ESR.

5) The sampling/monitoring plan that has been proposed upstream and downstream of the new outlet should be submitted to the MECP District Office for review once it is developed.

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
Regional Environmental Planner, Project Review Unit, MECP

cc Marcelina Wilson, Supervisor, Windsor Area Office, MECP
Marc Bechard, Water Compliance Supervisor, Sarnia District Office, MECP
Janelle Coombs, Project Administrator, City of Windsor
Jian Li, Project Manager, Stantec

Stantec

Stantec Consulting Ltd.
140 Ouellette Place, Unit 140
Windsor ON N8X 1L9

March 28, 2023
File: 165620239

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: Project Review Unit Comments
Municipal Class Environmental Assessment, Notice of Draft ESR
– St. Rose Stormwater Pumping Station, City of Windsor

Thank you for your prompt response to the February 23, 2023, Draft Environmental Study Report (ESR) for St. Rose Stormwater Pumping Station, City of Windsor. Please note that the ESR will be updated to reflect the comments provided in your letter of March 22, 2023. The following is in response to your comments:

1) Indigenous Consultation – Field Participation Agreement

   The Caldwell First Nation requested a Fieldwork Participation Agreement through their initial email on June 13th, 2022, in response to the Notice of Public Information Centre No. 2. The proponent did not commit to a Fieldwork Participation Agreement for this project because the fieldwork portion of the project was completed prior to the community's request and no additional fieldwork is planned for this project.

   The Aboriginal Consultation Log in **Appendix C** of the ESR has been updated such that the outcome of the request for a Fieldwork Participation Agreement is noted.

   In Phase 5 implementation of this project, should previously undocumented archaeological resources be discovered, there may be a new archaeological site and therefore subject to Section 48(1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the Ontario Heritage Act. If any further archaeological field investigation is required, as identified above, the City will engage with all indigenous communities that have been engaged with to date, and will facilitate the participation in archaeological field work (if applicable) via a Fieldwork Participation Agreement.

2) Indigenous Consultation – Continued Engagement with all Communities

   The proponent will continue to engage with all communities that have been engaged with to date as the Class EA process proceeds.

Reference: Project Review Unit Comments Municipal Class Environmental Assessment, Notice of Draft ESR – St. Rose Stormwater Pumping Station, City of Windsor

3) Soil, Sediments, and Brownfields
   Table 6.1 in **Section 6.1** of the ESR has been updated to provide context on the potential effect of the project for the indicated effects and measures.
   The ESR has been updated such that the (i) pertinent results of the soil characterization, (ii) impact on preferred alternatives, and (iii) confirmation that soil conditions do not represent a hazard to human health or to the ecosystem are noted in **Section 2.4.3 Soils and Subsurface Conditions**. A Preliminary Soil Characterization Report is included in **Appendix D** of the ESR and influenced the evaluation carried out for the site selection, shown in the Technical Memorandum (refer to **Section 3.2.1.6** of the Technical Memorandum in **Appendix B**).

4) Surface Water – Potential for Environmental Compliance Approval (ECA)
   In Phase 5 implementation of this project, the proponent will consult further with the MECP Environmental Permissions Branch regarding potential ECA requirements. Should the ECA be required, the proponent will obtain an ECA prior to starting the construction of the proposed pumping station. The ESR has been updated such that it is noted in **Section 6.4 Permitting Considerations Subsection 6.4.2 MECP**.

5) Surface Water – Sampling / Monitoring Plan
   The sampling/monitoring plan that has been proposed upstream and downstream of the new outlet (before and one year after construction) will be submitted to the MECP District Office for review once it has been approved. The ESR has been updated such that this is noted in **Section 6.2.8 Surface Water Quality**.

Sincerely,
Stantec Consulting Ltd.

Chrissy Jung M.A.Sc., E.I.T.
Environmental Engineer in Training
Phone: 519 966 2250 ext. 322
chrissy.jung@stantec.com

Jian Li Ph.D., P.Eng., PE
Project Manager
Phone: 519 966 2250 ext. 240
jian.li@stantec.com

c. Ms. Janelle Coombs, Project Administrator, City of Windsor
Ms. Karla Barboza, Team Lead – Heritage Planning Unit, MCM

APPENDIX C

First Nations Consultation Log

Aboriginal Consultation Log
Municipal Class Environmental Assessment
St. Rose Storm Water Pumping Station, City of Windsor

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: January 28, 2022 Method: Via Email	The Notice of Commencement was sent to Molly Mann and Heather Levecque, on January 28th, 2022, via Email	N/A
	1st Open House Date: February, 22, 2022 Method: Newspaper and Email	The Notice of 1st Open House was published in the Windsor Star on February 19, 2022. 1st Open House was held on March 2, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on February 22, 2022.	N/A
	2nd Open House Date: June 10, 2022 Method: Newspaper and Email	The Notice of 2nd Open House was published in the Windsor Star on June 11, 2022. 2nd Open House was held on June 23, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on June 10, 2022.	N/A
	Draft ESR Date: February 23, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on February 23, 2023.	N/A
	Notice of Completion Date: TBD Method: Email	A Notice of Completion, including access information to the electronic copy of final draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on TBD.	No responses and comments received
Southern First Nations Secretariat Ms. Jennifer Whiteye jenwhiteye@sfns.on.ca Executive Director 22361 Austin Line Bothwell, ON N0L 1Y0	**Notice of Commencement** Date: January 28, 2022 Method: Via Email	The Notice of Commencement was sent to Jennifer Whiteye on January 28th, 2022, via Email.	N/A
	1st Open House Date: February, 22, 2022 Method: Newspaper and Email	The Notice of 1st Open House was published in the Windsor Star on February 19, 2022. 1st Open House was held on March 2, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on February 22, 2022.	N/A
	2nd Open House Date: June 10, 2022 Method: Newspaper and Email	The Notice of 2nd Open House was published in the Windsor Star on June 11, 2022. 2nd Open House was held on June 23, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on June 10, 2022.	N/A
	Draft ESR Date: February 23, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on February 23, 2023.	N/A
	Notice of Completion Date: TBD Method: Email	A Notice of Completion, including access information to the electronic copy of final draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on TBD.	No responses and comments received
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: January 28, 2022 Method: Via Email	The Notice of Commencement was sent to Dr. Dean Jacobs and Janet MacBeth on January 28th, 2022, via Email.	N/A
	1st Open House Date: February, 22, 2022 Method: Newspaper and Email	The Notice of 1st Open House was published in the Windsor Star on February 19, 2022. 1st Open House was held on March 2, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on February 22, 2022.	N/A
	2nd Open House Date: June 10, 2022 Method: Newspaper and Email	The Notice of 2nd Open House was published in the Windsor Star on June 11, 2022. 2nd Open House was held on June 23, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on June 10, 2022.	N/A
	Draft ESR Date: February 23, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on February 23, 2023.	N/A

Aboriginal Consultation Log
Municipal Class Environmental Assessment
St. Rose Storm Water Pumping Station, City of Windsor

Contact Information	Date/Method of Communication	Correspondence Received and/or Project Information Distributed	Consultant Response
	Notice of Completion Date: TBD Method: Email	A Notice of Completion, including access information to the electronic copy of final draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on TBD.	No responses and comments received
Métis Nation of Ontario, Thames Bluewater Métis Council Kathleen Anderson tbwmc.president@gmail.com President 183 Summerset Crescent London, ON N6K 3S5	**Notice of Commencement** Date: January 28, 2022 Method: Via Email	The Notice of Commencement was sent to Kathleen Anderson on January 28th, 2022 via Email.	N/A
	1st Open House Date: February, 22, 2022 Method: Newspaper and Email	The Notice of 1st Open House was published in the Windsor Star on February 19, 2022. 1st Open House was held on March 2, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on February 22, 2022.	N/A
	2nd Open House Date: June 10, 2022 Method: Newspaper and Email	The Notice of 2nd Open House was published in the Windsor Star on June 11, 2022. 2nd Open House was held on June 23, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on June 10, 2022.	N/A
	Draft ESR Date: February 23, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on February 23, 2023.	N/A
	Notice of Completion Date: TBD Method: Email	A Notice of Completion, including access information to the electronic copy of final draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on TBD.	No responses and comments received
Caldwell First Nation Michelle McCormack consultation@caldwellfirstnation.ca Consultation Coordinator Zach Hamm Ecc2@caldwellfirstnation.ca 14 Orange Street Leamington, ON N8H 1P5	**Notice of Commencement** Date: January 31, 2022 Method: Via Email and Online Consultation Tool	The Notice of Commencement was sent to Michelle McCormack and Zach Hamm on January 31st, 2022, via Email. In addition, the project was submitted online through the online consultation tool: www.consultwithcaldwell.ca	N/A
	1st Open House Date: February 22, 2022 Method: Via Email and Online Consultation Tool	The Notice of 1st Open House was published in the Windsor Star on February 19, 2022. 1st Open House was held on March 2, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on February 22, 2022.	N/A
	2nd Open House Date: June 10, 2022 Method: Via Email and Online Consultation Tool	The Notice of 2nd Open House was published in the Windsor Star on June 11, 2022. 2nd Open House was held on June 23, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on June 10, 2022.	Received an email from Zack Hamm on June 13, 2022, via email. Caldwell First Nation would like to engage in detailed consultation with the proponent. A 'Fieldwork Participation Agreement' and 'Technical Review Agreement' which outlined capacity funding was sent to the City on July 15, 2022. The City advised via email on October 11, 2022, that they would not be able to provide funding for the review of Class EA study materials for these municipal class environmental assessments. Further, the City did not commit to a Fieldwork Participation Agreement for this project because the fieldwork portion of the project was completed prior to the community's initial request. During the implementation phase of this project the proponent will continue to engage with the Caldwell First Nation and facilitate the participation in archaeological field work (if applicable).
	Draft ESR Date: February 23, 2023 Method: Via Email and Online Consultation Tool	An email, including access information to the electronic copy of draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on February 23, 2023.	Caldwell First Nation indicated that they would not be allotting technical staff to review the Draft ESR at this time due to lack of funding.

Aboriginal Consultation Log
Municipal Class Environmental Assessment
St. Rose Storm Water Pumping Station, City of Windsor

Contact Information	Date/Method of Communication	Correspondence Received and/or Project Information Distributed	Consultant Response
	Notice of Completion Date: TBD Method: Email and Online Consultation Tool	A Notice of Completion, including access information to the electronic copy of final draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on TBD.	No responses and comments received
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: January 28, 2022 Method: Via Email	The Notice of Commencement was sent to Chief Chris Plain, Joanne Rogers, Cathleen O'Brien and Courtney Jackson on January 28, 2022, via Email.	N/A
	1st Open House Date: February, 22, 2022 Method: Newspaper and Email	The Notice of 1st Open House was published in the Windsor Star on February 19, 2022. 1st Open House was held on March 2, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on February 22, 2022.	N/A
	2nd Open House Date: June 10, 2022 Method: Newspaper and Email	The Notice of 2nd Open House was published in the Windsor Star on June 11, 2022. 2nd Open House was held on June 23, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on June 10, 2022.	N/A
	Draft ESR Date: February 23, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on February 23, 2023.	N/A
	Notice of Completion Date: TBD Method: Email	A Notice of Completion, including access information to the electronic copy of final draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on TBD.	No responses and comments received
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: January 28, 2022 Method: via Email	The Notice of Commencement was sent to Denise Stonefish on January 28th, 2022, via Email.	N/A
	1st Open House Date: February, 22, 2022 Method: Newspaper and Email	The Notice of 1st Open House was published in the Windsor Star on February 19, 2022. 1st Open House was held on March 2, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on February 22, 2022.	N/A
	2nd Open House Date: June 10, 2022 Method: Newspaper and Email	The Notice of 2nd Open House was published in the Windsor Star on June 11, 2022. 2nd Open House was held on June 23, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on June 10, 2022.	N/A
	Draft ESR Date: February 23, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on February 23, 2023.	N/A
	Notice of Completion Date: TBD Method: Email	A Notice of Completion, including access information to the electronic copy of final draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on TBD.	No responses and comments received
Metis Nation of Ontario Margaret Froh	**Notice of Commencement** Date: January 28, 2022 Method: via Email	The Notice of Commencement was sent to Margaret Froh on January 28th, 2022, via Email.	N/A

Aboriginal Consultation Log
Municipal Class Environmental Assessment
St. Rose Storm Water Pumping Station, City of Windsor

Contact Information	Date/Method of Communication	Correspondence Received and/or Project Information Distributed	Consultant Response
margaretF@metisnation.org Director, Lands, Resources and Consultations 75 Sherbourne Street, Unit 311 Toronto ON M5A 2P9	**1st Open House** Date: February, 22, 2022 Method: Newspaper and Email	The Notice of 1st Open House was published in the Windsor Star on February 19, 2022. 1st Open House was held on March 2, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on February 22, 2022.	N/A
	2nd Open House Date: June 10, 2022 Method: Newspaper and Email	The Notice of 2nd Open House was published in the Windsor Star on June 11, 2022. 2nd Open House was held on June 23, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on June 10, 2022.	N/A
	Draft ESR Date: February 23, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on February 23, 2023.	N/A
	Notice of Completion Date: TBD Method: Email	A Notice of Completion, including access information to the electronic copy of final draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on TBD.	No responses and comments received
Chippewas of Kettle and Stony Point First Nation Jason Henry Jason.Henry@kettlepoint.org Chief Emily Ferguson consultation@kettlepoint.org Consultation Advisor 6247 Indian Lane, R.R. #2 Forest, ON N0N 1J1	**Notice of Commencement** Date: January 28, 2022 Method: via Email	The Notice of Commencement was sent to Jason Henry and Valerie George on January 28th, 2022, via Email.	N/A
	1st Open House Date: February, 22, 2022 Method: Newspaper and Email	The Notice of 1st Open House was published in the Windsor Star on February 19, 2022. 1st Open House was held on March 2, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on February 22, 2022.	N/A
	2nd Open House Date: June 10, 2022 Method: Newspaper and Email	The Notice of 2nd Open House was published in the Windsor Star on June 11, 2022. 2nd Open House was held on June 23, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on June 10, 2022.	Received a response from Emily Ferguson on July 8th, 2022, via email. CKSPFN is reviewing consultation emails and requested a project update to learn more about the environmental impact and archaeological potential of this project. Stantec provided a project update via email on July 18th, 2022.
	Draft ESR Date: February 23, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on February 23, 2023.	N/A
	Notice of Completion Date: TBD Method: Email	A Notice of Completion, including access information to the electronic copy of final draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on TBD.	No further responses and comments received
Chippewas of the Thames First Nation Jacqueline French jfrench@cottfn.com Chief Kelly Riley kriley@cottfn.com Director of Treaties, Lands & Environment Fallon Burch fburch@cottfn.com Consultation Coordinator 320 Chippewa Road	**Notice of Commencement** Date: January 28, 2022 Method: via Email	The Notice of Commencement was sent to Chief Jacqueline French, Kelly Riley and Fallon Burch January 28th, 2022, via Email.	Received a response from Fallon Burch on February 10th, 2022, via email. Based on their review they have no concerns with the information that has been presented to COTTFN at this time. It would be their preference to be removed from the mailing list of this project. However, they ask that if there are substantive changes to the project that we be notified.

Aboriginal Consultation Log
Municipal Class Environmental Assessment
St. Rose Storm Water Pumping Station, City of Windsor

Contact Information	Date/Method of Communication	Correspondence Received and/or Project Information Distributed	Consultant Response
Muncey, ON N0L 1Y0			
Onelda 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: January 28, 2022 Method: via Email	The Notice of Commencement was sent to Chief Adrian Chrisjohn and Cherilyn Hill on January 28th, 2022, via Email.	N/A
	1st Open House Date: February, 22, 2022 Method: Newspaper and Email	The Notice of 1st Open House was published in the Windsor Star on February 19, 2022. 1st Open House was held on March 2, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on February 22, 2022.	N/A
	2nd Open House Date: June 10, 2022 Method: Newspaper and Email	The Notice of 2nd Open House was published in the Windsor Star on June 11, 2022. 2nd Open House was held on June 23, 2022. The notice of open house was emailed to individual Aboriginal communities to solicit comments and inputs on June 10, 2022.	N/A
	Draft ESR Date: February 23, 2023 Method: Email	An email, including access information to the electronic copy of draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on February 23, 2023.	N/A
	Notice of Completion Date: TBD Method: Email	A Notice of Completion, including access information to the electronic copy of final draft ESR report, was mailed to individual Aboriginal communities to solicit comments and inputs on TBD.	No responses and comments received

CHIPPEWAS OF THE THAMES FIRST NATION

February 10, 2022

VIA EMAIL

Janelle Coombs
Project Administrator, City of Windsor
350 City Hall Square West, Suite 310
Windsor, ON N9A 6S1

RE: St. Rose Stormwater Pumping Station Municipal Class Environmental Assessment Notice of Study Commencement

Dear: Janelle,

We have reviewed information concerning the aforementioned project. The proposed project is located within the McKee Treaty (1790) area to which Chippewas of the Thames First Nation (COTTFN) is a signatory. The project is also located within the Big Bear Creek Additions to Reserve Land Selection Area as well as COTTFN's traditional territory.

After reviewing the project information, we have identified minimal concerns with the information that you have presented to us at this time. However, we ask that if there are any substantive changes to your project that you notify COTTFN of these changes.

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. The protocol is available on our website at www.cottfn.com/consultation. As per *'Appendix D'* of the Wiindmaagewin attached is invoice 0229.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Fallon Burch
Consultation Coordinator
Chippewa of the Thames First Nation
consultation@cottfn.com

c: Jian Li, Project Manger, Stantec

APPENDIX D: FIELD INVESTIGATIONS

1. Geotechnical Assessment Report
2. Preliminary Soil Characterization Report
3. Stage 2 Archaeological Assessment Report
4. Ministry of Tourism, Culture and Sport Letter Affirming Entry of 'Stage 2 Archaeological Assessment Report' into the Ontario Public Register
5. Marine Archaeological Assessment Report
6. Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes – Checklist
7. Natural Heritage Impact Assessment Report

APPENDIX D

Geotechnical Assessment Report

REPORT

Geotechnical Assessment and Preliminary Geotechnical Exploration and Testing Program

Proposed St. Rose Pump Station Class Environmental Assessment, Windsor, Ontario

Submitted to:

Mr. Jian Li, Ph.D., P.Eng., P.E.
Stantec Consulting Ltd.
100-2555 Ouellette Avenue
Windsor, Ontario N8X 1L9

Submitted by:

Golder Associates Ltd.
1825 Provincial Road, Unit 1, Windsor, ON N8W 5V7, Canada

+1 519 250 3733

21482896-R01-Rev0

December 2021

Distribution List

1 E-Copy: Golder Associates Ltd.

1 E-Copy: Stantec Consulting Ltd.

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Records of Boreholes

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Figure 1: Location Plan (West of St. Rose Avenue)

Figure 2: Location Plan (East of St. Rose Avenue)

Figure 3: Grain Size Distribution – sandy SILTY CLAY to CLAYEY SILT

Figure 4: Plasticity Chart

APPENDICES

APPENDIX A
Records of Previous Boreholes

1.0 INTRODUCTION

This report presents the results of the geotechnical assessment and preliminary geotechnical exploration and testing program carried out to support the Class Environmental Assessment (EA) of the St. Rose pump station, to be located at St. Rose Avenue and Riverside Drive East in the City of Windsor, Ontario (referred to hereinafter as “the Site” or “Project Area”). The location of the Site is shown on the Key Plan, Figure 1.

Based on the project information provided by Stantec Consulting Ltd. (“Stantec”), it is understood that a new 11-metre-deep pump station with a storm sewer outlet to the Detroit River will be constructed at the Site. At this time, the current requested scope of work is required for the Class EA study of the new pump station infrastructure and not for detailed design.

The purpose of the geotechnical assessment was to evaluate the subsurface soil and groundwater conditions based on available mapping (topographic, surficial soil, and bedrock geological mapping) and borehole data from previous geotechnical work in the general area of the Site to outline the general geotechnical conditions and delineate areas of geotechnical opportunities/constraints for the project. The purpose of the preliminary geotechnical exploration and testing program was to supplement the available geotechnical data and provide preliminary recommendations for the geotechnical design aspects of the proposed works.

Confirmation of authorization to proceed with the assessment and exploration, in accordance with our July 28, 2021 proposal (CX21482896), was provided by Mr. Jian Li, Ph.D., P.Eng., P.E., on behalf of Stantec on September 10, 2021.

This report should be read in conjunction with the attached document “Important Information and Limitations of This Report”, which comprises an integral component hereof. The reader’s attention is specifically drawn to this material, as it is essential for the proper use and interpretation of the information presented and discussed herein.

2.0 GEOTECHNICAL ASSESSMENT METHODOLOGY

To evaluate the subsurface conditions in the vicinity of the Site, existing geological and geotechnical information in the area of the Site, readily available from our files, was compiled and reviewed. The information consisted of topographical mapping, aerial mapping, soils and bedrock mapping, geological data, and geotechnical data from previous explorations carried out adjacent to the Site. The relevant previous explorations are identified as follows:

- Golder Report No. 73572 titled “Subsurface Investigation, Wyandotte Street East Reconstruction, From Janisse Drive to Lauzon Road” dated July 1973;
- Golder Report No. 73666 titled “Subsurface Investigation, Proposed St. Rose Avenue Storm Outfall Sewer, Windsor, Ontario” dated January 1974;
- Golder Report No. 13-1140-0026-R01 titled “Geotechnical Investigation, Proposed Road Reconstruction, Fairview Boulevard, Wyandotte Street East to St. Rose Avenue, Windsor, Ontario”, dated March 2013; and
- Golder Report No. 1899798-R01 titled “Geotechnical Explorations, Pavement Evaluations, St. Joseph and St. Rose Catholic Elementary Schools” dated June 2018.

The subsurface conditions encountered in the relevant previous boreholes are shown in detail on the attached Record of Borehole sheets in Appendix A. The approximate locations of the previous boreholes, or approximate study areas of the previous explorations, are shown on the Location Plans, Figures 1 and 2.

3.0 SITE DESCRIPTION

3.1 General

The proposed pump station will be located within St. Rose Beach in the City of Windsor, Ontario. St. Rose Beach is bounded by the Detroit River to the north, Riverside Drive East to the south, and residential properties to the east and west. The property is relatively flat and currently serves as a park for community land use. As currently envisaged, the pump station would be located in the eastern grassed portion of the Project Area, where the property extends about 30 to 50 metres northwards to the Detroit River.

Aerial photography between 2000 and 2019 was reviewed via the County of Essex MapViewer digital mapping online resource. These aerial photographs were reviewed in order to develop a history of the development of the Site and surrounding properties. Based on the available photographs, the park can be seen dating back to 1999 and surrounding land use has remained residential.

3.2 Site Geology

3.2.1 Overburden Soils

The Project Area is located in the physiographic region of Southwestern Ontario known as the St. Clair Clay Plains. Within this region, Essex County and the southwestern part of Kent County are normally discussed as a sub-region known as the Essex Clay Plain. The clay plain was deposited during the retreat of ice sheets (late Pleistocene Era) when a series of glacial lakes inundated the area. In general, the ice sheets deposited materials with a glacial-till-like gradation in the Essex County area. Depending on the locations of the glacial ice sheets and depths of water in the ice-contact glacial lakes, the materials may have been directly deposited at the contact between the ice sheet and the bedrock or, as the lake levels rose, and the ice sheets retreated and floated, the soil and rock debris within and at the base of the ice were deposited through the lake water (glaciolacustrine depositional environment). The term “glacial till”, in its common usage, often indicates a very dense or hard composition resulting from consolidation and densification under the weight of the ice sheet and the mineral soil particles typically have a distribution of grain sizes ranging from cobbles to clay. In many areas of Essex County, however, the majority of the soils described as “glacial till” were deposited through water and have a soft to firm consistency below an upper “crust” that has since become stiff to hard through weathering and desiccation. At this site, these materials have generally been described as sandy silty clay of low plasticity, with a trace of gravel.

The quaternary geology mapping from the Ontario Department of Mines Preliminary Geological Map No. 3253 titled “Quaternary Geology, Essex County Area (West Half), Southern Ontario” dated 1994 indicates that the predominant soil types are Pleistocene deposits consisting of glaciolacustrine silty clay and clayey silt till.

3.2.2 Bedrock

The bedrock underlying the Project Area is reported to consist of Middle Devonian limestone of the Hamilton Group Formation. Available bedrock depth mapping from the Ontario Ministry of Northern Development and Mines Map No. P.3255 titled “Drift Thickness, Essex County Area (West Half)”, dated 1994, indicates a bedrock depth of about 53 metres.

4.0 PRELIMINARY EXPLORATION PROCEDURES

The field work for the preliminary geotechnical exploration and testing program was carried out on October 4, 2021 at which time three (3) boreholes, designated as boreholes (BH)-101, BH-102A and BH-102B were advanced to depths of about 15.8 metres, 1.7 metres, and 12.8 metres below the existing ground surface, respectively. The approximate borehole locations are shown on the Location Plan, Figure 1.

The boreholes were drilled using a truck-mounted drilling rig supplied and operated by a specialist drilling contractor licensed by the Ministry of the Environment, Conservation and Parks (MECP[1]). The field work was supervised by a qualified member of our geotechnical engineering staff who located the boreholes in the field, obtained underground utility clearances, directed the drilling and sampling operations, logged the boreholes, and cared for the soil samples obtained. During the drilling of the boreholes, soil sampling was carried out at selected intervals of depth using standard 35-millimetre inside diameter split-spoon sampling equipment in accordance with the Standard Penetration Test (SPT) procedures outlined in ASTM International standard D1586: ‘Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils’. The SPTs were conducted using an automatic hammer. The SPT N values[2] presented on the Record of Borehole sheets and discussed herein are the values measured directly in the field and are unfactored. Field vane shear strength testing was carried out, in accordance with ASTM International standard D2573, in the softer cohesive deposits to evaluate peak and remoulded undrained shear strengths.

At the location of BH-102A, an obstruction was encountered at a depth of about 1.7 metres below ground surface during drilling. Borehole BH-102A met refusal (with both the split-spoon sampler and power augering equipment) at about 1.7 metres below the ground surface and, subsequently, a new borehole (BH-102B) location was established about 1 metre south of BH-102A. In BH-102B, soil sampling and logging was carried out starting from about 1.5 metres below ground surface and extending to the depth of borehole termination at about 12.8 metres below ground surface. As indicated on the Record of Borehole sheet for borehole BH-102B, the soil stratigraphy in the upper 1.5 metres of the borehole was inferred from the stratigraphy encountered in BH-102A.

The soil samples were classified in the field, placed in individually labelled 1-litre sealable plastic bags and transported to our Windsor office for further examination and laboratory testing. The boreholes were monitored for groundwater seepage during drilling. Following drilling, the boreholes were backfilled in accordance with the requirements of the Revised Regulations of Ontario (R.R.O.) 1990, Ontario Regulation (O.Reg.) 903, as amended, of the Ontario Water Resources Act.

The soil stratigraphy and groundwater conditions encountered in the boreholes, as well as the results of field and laboratory testing, are shown in detail on the Record of Borehole sheets and Figures 3 and 4 following the text of this report. The ground surface elevations at the borehole locations were measured by Golder staff using an established local benchmark defined as *“middle of catchbasin located at south sidewalk edge of St. Rose Beach sidewalk (north edge of Riverside Drive road edge, adjacent to St. Rose Avenue)”*. This local benchmark was assigned an arbitrary ground surface elevation of 100.0 metres. Based on the elevation survey, the ground surface elevations at the borehole locations ranged from about elevation 100.6 metres to 100.8 metres. The water level in the Detroit River was at about elevation 99.7 metres on October 4, 2021.

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[1] Formerly Ministry of Environment and Climate Change (MOECC), formerly Ministry of Environment (MOE).

[2] The SPT N value is defined as the number of blows required by a 63.5-kilogram hammer dropped from a height of 760 millimetres to drive a split spoon sampler a distance of 300 millimetres into the soil after having first penetrated 150 millimetres.

5.0 SUBSURFACE CONDITIONS

5.1 General

The subsurface conditions encountered in the boreholes advanced at the Site, together with the results of in situ and geotechnical laboratory testing, are shown on the attached Record of Borehole sheets and Figures 3 and 4 following the text of this report. Records of previous boreholes advanced in the area of the Site are shown in Appendix A. The following paragraphs have been simplified in terms of major soil strata for the purposes of geotechnical design. The soil boundaries indicated have been inferred from non-continuous samples and observations of sampling and drilling resistance and typically represent transitions from one soil type to another rather than exact planes of geological change. Further, the subsurface conditions will vary between and beyond the borehole locations.

5.2 Previous Borehole Data

Geotechnical data from 27 boreholes advanced near the Site were retrieved from our files. The soil stratigraphy, groundwater conditions, and results of field and laboratory testing are shown on the previous Record of Borehole sheets in Appendix A. The approximate locations of the previous boreholes, or approximate study areas of the previous explorations, are shown on the Location Plans, Figures 1 and 2. In general, the subsurface conditions in the vicinity of the Site consist of existing fill, topsoil, and pavement structures underlain by an extensive deposit of native silty clay to sandy silty clay.

5.3 Current (2021) Preliminary Exploration

5.3.1 Topsoil

Topsoil was encountered at the ground surface in all boreholes and was measured to be about 100 to 150 millimetres thick. The noted thicknesses are specific to the borehole locations and variations in the topsoil thickness should be anticipated in other areas of the Site. Materials designated as topsoil in this report were classified based solely on visual and textural evidence. Testing of organic content or for other soil nutrients was not carried out. Accordingly, materials classified as topsoil herein cannot necessarily be relied upon for support and growth of landscaping vegetation without supplemental soil fertility analyses.

5.3.2 Sandy Silty Clay Fill

Beneath the topsoil, all boreholes encountered a layer of sandy silty clay fill with organics, sand pockets and cobbles. The sandy silty clay fill had a brown to dark brown colouration. BH-102A was terminated in the sandy silty clay fill after exploring the layer for about 1.5 metres and encountering an obstruction. In BH-101, the sandy silty clay fill was about 2.0 metres thick and extended to about elevation 98.6 metres. In BH-102B, the sandy silty clay fill was about 2.4 metres thick and extended to about elevation 98.0 metres. Measured SPT N values obtained in the sandy silty clay fill ranged from 3 to 12 blows per 0.3 metres, indicating a soft to stiff consistency. Samples of the sandy silty clay fill had water contents ranging from about 7 to 22 per cent.

5.3.3 Granular Fill

Beneath the sandy silty clay fill, BH-101 encountered an approximately 0.3-metre-thick layer of sand and gravel fill, which extended to about elevation 98.3 metres. The granular fill had a dark grey colouration and a water content of about 12 per cent.

5.3.4 Native Sandy Silty Clay

Beneath the sandy silty clay fill or granular fill, BH-101 and BH-102B encountered a layer of native sandy silty clay. Borehole BH-101 was terminated in the native sandy silty clay after exploring the stratum for about 13.4 metres (or to an elevation of about 84.9 metres). In BH-102B, the native sandy silty clay was about 3.0 metres thick and extended to an elevation of about 95.0 metres. The native sandy silty clay had a mottled brown and grey, brown, and grey colouration. Measured SPT N values obtained in the native sandy silty clay ranged from 0 (i.e., the static weight of the 63.5-kilogram sampling hammer) to 19 blows per 0.3 metres, indicating a very soft to very stiff consistency. Samples of the native sandy silty clay had water contents ranging from about 12 to 36 per cent.

Grain size distribution analyses and Atterberg limits testing were carried out on a sample of the native sandy silty clay, the results of which are shown on Figure 3 and Figure 4, respectively (BH-101 sample 12). The results of the Atterberg limits testing indicate an inorganic silty clay of low plasticity.

Field vane shear strength testing was carried out in the softer grey sandy silty clay layer and the results yielded peak undrained shear strengths ranging from about 40 to 51 kilopascals, remoulded shear strengths ranging from about 19 to 32 kilopascals, and sensitivity values (ratio of peak to remoulded undrained shear strength) ranging from about 1.3 to 2.0. The ratio of peak to remoulded undrained shear strength indicates that the native sandy silty clay materials are considered overall to be slightly to medium sensitive to strength loss due to disturbance, and slightly sensitive to strength loss due to disturbance on average.

Although not specifically encountered in the boreholes, the presence of cobbles and boulders should be anticipated in the native sandy silty clay stratum.

5.3.5 Native Sandy Silty Clay to Clayey Silt

Beneath the native sandy silty clay, BH-102B encountered and was terminated in a layer of native sandy silty clay to clayey silt after exploring the stratum for about 7.2 metres (or to an elevation of about 87.8 metres). The native sandy silty clay to clayey silt had a grey colouration. Measured SPT N values obtained in the native sandy silty clay to clayey silt ranged from 0 (i.e., the static weight of the 63.5-kilogram sampling hammer) to 2 blows per 0.3 metres, indicating a very soft to soft consistency. Samples of the native sandy silty clay to clayey silt had water contents ranging from about 16 to 20 per cent.

Grain size distribution analyses and Atterberg limits testing were carried out on a sample of the native sandy silty clay to clayey silt, the results of which are shown on Figure 3 and Figure 4, respectively (BH-102B sample 9). The results of the Atterberg limits testing indicate a slightly plastic inorganic silty clay to clayey silt.

Field vane shear strength testing was carried out in the native sandy silty clay to clayey silt and the results yielded peak undrained shear strengths ranging from about 38 to 49 kilopascals, remoulded shear strengths ranging from about 24 to 32 kilopascals, and sensitivity values ranging from about 1.4 to 1.6. The ratio of peak to remoulded undrained shear strength indicates that the native sandy silty clay to clayey silt materials are considered to be slightly sensitive to strength loss due to disturbance.

5.3.6 Groundwater Conditions

Groundwater seepage conditions were observed in the boreholes during drilling as shown on the Record of Borehole sheets. Groundwater was encountered at a depth of about 14.1 metres below ground surface in BH-101 (or about elevation 86.7 metres) and at a depth of about 12.5 metres below ground surface in BH-102B (or about elevation 88.1 metres). As noted above, the water level in the Detroit River was at about elevation 99.7

metres on October 4, 2021. It should be noted that groundwater conditions are generally dependent on the amount of precipitation, site grading and other measures in place to control surface water drainage, the corresponding surface water level in the Detroit River, as well as the time of year, and can fluctuate significantly in elevation over time.

The depth below which the native sandy silty clay stratum is permanently saturated can be inferred by the depth of colour change from brown to grey, which was observed at a depth of about 5.6 metres below ground surface (or about elevation 95 metres).

6.0 DISCUSSION

This section of the report provides our interpretation of the factual geotechnical data obtained during the field work and it is intended for the guidance of the design engineer. Where comments are made on construction, they are provided only to highlight those aspects which could affect the design of the project. Contractors bidding on or undertaking the works should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction, and make their own independent interpretation of the subsurface information provided as it affects their proposed construction means and methods, equipment selection, scheduling, pricing, and the like.

6.1 Site Preparation

It is recommended that all surficial vegetation, topsoil, uncontrolled fill and any loose, organic, excessively wet or deleterious materials be sub-excavated from the areas of the proposed pump station. Topsoil was encountered at the ground surface in all boreholes and was about 100 to 150 millimetres thick. Beneath the topsoil, a layer of sandy silty clay fill with organics, cobbles and sand pockets was encountered and was about 2.0 to 2.4 metres thick at the locations of BH-101 and BH-102B, extending to elevations ranging from about 98.0 to 98.6 metres. An approximately 0.3-metre-thick layer of granular fill was also encountered beneath the sandy silty clay fill in BH-101, extending to an elevation of about 98.3 metres. Borehole BH-102A encountered an obstruction within the fill at about 1.7 metres below ground surface.

The stripped/excavated materials are not considered to be suitable as subgrade materials, general backfill or for the support of structures and must be completely removed from the limits of the proposed development.

6.2 Excavations and Groundwater Control

All excavations should be carried out in accordance with the latest edition of the Ontario Occupational Health and Safety Act and Regulations for Construction Projects (OHSA). The OHSA regulations governing excavation support and maximum side wall inclinations apply to excavations extending to depths of greater than 1.2 metres below the adjacent ground surface.

Based on the data from the previous explorations and preliminary geotechnical exploration, excavations for pump station construction will encounter topsoil and fill materials underlain by an extensive deposit of generally firm to very stiff (based on the field vane shear strength testing results) native sandy silty clay. Although not specifically encountered in the boreholes, cobbles and boulders should be anticipated within the sandy silty clay stratum. Further, an obstruction was encountered in BH-102A at a depth of about 1.7 metres below ground surface.

As per OHSA, any stiff to very stiff silty clay would be classified as a Type 2 soil, whereas any soft to firm silty clay would be classified as Type 3 soils. Under the OHSA criteria, unsupported excavations in Type 2 and 3 soils should have side slopes inclined no steeper than 1 horizontal to 1 vertical.

In all cases, the OHSA soil type categories are based on generalized ground behaviour conditions with respect to the need for worker protection and compliance with the Act. Further, layered soil types or construction staging of excavations can change the OHSA categorization that might apply. During construction, the exposed ground should be observed by experienced geotechnical personnel to confirm the OHSA classification that will apply.

Considering the relatively low permeability of the soils encountered in the preliminary boreholes, groundwater seepage should be relatively minor. Nevertheless, some groundwater seepage into open excavations should be anticipated. Inflows may be controlled by pumping from properly filtered sumps located within the excavation. The anticipated pumping rates would likely be sufficiently low that a Permit to Take Water (PTTW) or registration on the Environmental Activity and Sector Registry (EASR) should not be required. If encountered, water inflows due to perched groundwater within any surficial granular fills or native sands or silt overlying the less permeable cohesive materials should be expected.

Care should be taken to direct all surface water away from excavations. Depending on the prevailing weather conditions, it may be necessary to flatten excavation side slopes in the fill materials and/or blanket the slopes with free-draining material to enhance stability and control ground losses.

6.2.1 Supported Excavations

Any shoring systems that may be designed as part of the proposed works should include an evaluation of base stability, soil squeezing stability and hydraulic uplift stability as defined in the Canadian Foundation Engineering Manual (CFEM, 2006). The shoring system should be designed to account for horizontal/lateral earth loads, surcharge loads, groundwater pressure and the effects of weather as well as the project requirements for controlling ground displacements. Where existing buildings or infrastructure lie within the zone of influence of the shoring (as defined by a line drawn upward and outward from the base of the excavation at an inclination of 1 horizontal to 1 vertical) the shoring deflections need to be strictly limited.

Lateral pressures for design of the temporary structures will depend on the temporary structure design and the nature and spacing of the lateral support (bracing) provided. The distribution of lateral pressures and shape of the apparent lateral pressure envelope on a shoring system depends greatly on the methods used, the stiffness, and the degree of lateral bracing, prestressing or restraint. As such, the distribution of lateral earth pressures for such a system is best left to the ultimate specialist designer of the shoring who can best account for such conditions. It is a common practice for a specialist contractor to design and install the excavation support system.

Although the final design of the shoring will be completed by the contractor, the parameters presented below are provided to enable the structural designer to develop a conceptual design and assess the approximate construction costs for the shoring systems.

Soil Type	Bulk Soil Unit Weight* (kg/m³)	Angle of Internal Friction (°)	Coefficient of Active Earth Pressure (K_a)	Coefficient of Passive Earth Pressure (K_p)	Coefficient of At-Rest Earth Pressure (K_o)	Coefficient of Friction (μ)
Native Silty Clay	1,800	28°	0.36	2.77	0.53	0.35
Granular 'A' (OPSS 1010)	2,100	35°	0.27	3.69	0.43	0.47
Granular 'B' Type I (OPSS 1010)	2,000	33°	0.29	3.39	0.46	0.43

*Note: Saturated unit weights may be calculated by multiplying the bulk unit weights by 1.1; buoyant unit weights may be calculated by subtracting 1,000 kg/m³ from the saturated unit weights. Hydrostatic pressures should be added where buoyant unit weights are assumed. The earth pressure coefficients noted above are based on a horizontal surface adjacent to the excavation. If sloped surfaces are present, the coefficient of earth pressure should be adjusted accordingly. The total passive resistance below the base of the excavation (i.e., adjacent to the temporary protection system) may be calculated based on the values of K_p indicated above but reduced by an appropriate factor that considers the allowable wall movement to account for the fact that a large strain would be required for mobilization of the full passive resistance. For longer-term (drained) analyses, cohesion should be assumed to be nil for all soil types.

Settlement monitoring should be carried out twice daily on adjacent buildings and infrastructure which lie within the zone of influence of the excavation. If half of the settlement tolerance of any such building or infrastructure elements is exceeded, excavation should cease and the contractor's means and methods re-evaluated.

For trench excavations, analyses of excavation depths and undrained shear strengths yield the following relationship between the maximum stable depth of a trench excavation and the undrained shear strength of the cohesive soil forming the side walls and base of the excavation based on a factor of safety against basal instability of 1.5, and an assumed surcharge of 20 kilopascals. As noted above, minimum peak and remoulded undrained shear strengths of about 38 and 19 kilopascals, respectively, were measured in the native cohesive materials.

Shear Strength C_u, kPa	Maximum Depth of Excavation (m)
20	4.1
25	5.3
30	6.6
35	7.7

Shear Strength C_u, kPa	Maximum Depth of Excavation (m)
40	8.9
45	10.2
50	11.4

6.3 General Backfill

Any existing topsoil, fill, organics, wet, or deleterious fill materials excavated from the Site are not considered suitable as general backfill. The table below provides a summary of the stratigraphic units encountered during the preliminary exploration and commentary regarding their re-use as general backfill from a geotechnical perspective.

Stratigraphic Unit	Acceptable for Re-Use as General Backfill
Topsoil and Fill Materials	**No** – fill materials are heterogeneous in nature and contain organics
Native Sandy Silty Clay (Grey Colouration) and Native Sandy Silty Clay to Clayey Silt	**No** – materials are above their estimated optimum water contents for mechanical compaction purposes
Native Sandy Silty Clay (Mottled Brown and Grey to Brown Colouration)	**Yes** – materials are at or near their estimated optimum water contents for mechanical compaction purposes

Materials should not be considered acceptable as backfill when the placement water content exceeds the optimum water content (as determined by the standard Proctor compaction test ASTM International D698) by more than about 2 to 4 per cent (depending on the nature of the material). Further, material that is more than 3 per cent dry of the optimum water content should be wetted during compaction to limit post construction settlement or should not be used.

The native silty clay soils are cohesive in nature. When these cohesive soils are used for backfilling, it is essential that these materials be broken down and compacted thoroughly to reduce the size and frequency of voids and reduce the potential for settlement. Should very moist to wet soils be encountered during the excavation operations, these soils will require extensive air-drying in order to achieve the specified field compaction. If time constraints do not permit air-drying of soils, they will have to be disposed of properly off-site and replaced with a suitable approved alternative such as Ontario Provincial Standard Specification (OPSS) Granular 'B' Type I.

If any utility alignments are located beneath proposed pavements, trench backfill material extending upward from the base of the trench to one meter below the pavement subgrade should be placed in loose lifts not exceeding a maximum thickness of 300 millimetres for granular materials and 200 millimetres for the native cohesive soils, and uniformly compacted to a minimum of 95 per cent of the material's standard Proctor maximum dry density (SPMDD) value. The upper one metre of backfill which comprises the pavement subgrade should be uniformly compacted to at least 98 per cent of SPMDD. If lesser degrees of compaction are achieved, increased settlements will result.

6.3.1 Pipe Bedding

The bedding material for any underground utilities constructed at the site should consist of an approved granular material, consistent with the type and class of pipe to be used. OPSS Granular 'A' is considered to be an appropriate bedding material for the site. The bedding should extend from 150 millimetres below the pipe invert to at least 300 millimetres above the pipe obvert. The pipe bedding should be uniformly compacted to at least 95 per cent of SPMDD in loose lifts not exceeding 300 millimetres in thickness. Hand tamping around the pipe may be required to ensure that no voids are present below the springline of the pipe. It is also important to provide well compacted granular bedding within the approach zone of the pipes at any manholes. In general, the use of material known locally as "graded clear stone" might be considered for pipe bedding up to the springline of the pipes; however, in general, such "clear stone" should not be used without the corresponding use of a non-woven geotextile filter fabric completely encapsulating the stone. Otherwise, the native fine-grained soils can soften over time as a result of water within the stone void spaces saturating the surrounding clay and allowing deformation and migration of the native soils into this void space.

Granular materials used for pipe bedding can create a subsurface reservoir or conduit for the accumulation and flow of water and, if such flow is not acceptable, low-permeability trench plugs around the pipe may be required. Should a trench support system be utilized (such as a trench liner box), care should be taken when removing the support system to not disturb and destabilize the compacted bedding material.

It should be noted that a trench liner box is designed primarily for worker protection and does not restrict the lateral movement of the adjacent soil mass or prevent loss of ground due to flowing soils under the influence of ground water. All structures and infrastructure founded within the zone of influence of the excavation (as defined by a line drawn upwards and outwards from the base of the excavation at an inclination of 1 horizontal to 1 vertical) should be accurately located and properly supported. In addition, any gaps between the exterior of the liner box and the excavation wall should be filled immediately to restore lateral support.

6.4 Bearing Pressures

It is understood that the proposed pump station is to be founded at a depth of approximately 11 metres below the existing ground surface. Based on the subsurface conditions encountered in the preliminary boreholes and the anticipated founding elevation, a factored net geotechnical resistance at the Ultimate Limit State (ULS) of 90 kilopascals and a net geotechnical reaction at the Serviceability Limit State (SLS) of 60 kilopascals (net pressure increase) may be used for preliminary design purposes. Prior to final design, it is recommended that a borehole be advanced to a depth of about 2 times the width of the pump station foundation below the pump station invert. A groundwater observation well should be installed and monitored to evaluate if pressurized groundwater conditions exist in the underlying soil strata.

In the case of soft clays underlying the base of an excavation where the factor of safety against basal instability is less than 2, substantial deformations may occur and if interlocking sheet piles are used for shoring, stability analyses should be carried out to determine the required depth of the sheeting toe to prevent basal instability or if unloading of the soil around the perimeter of the excavation is required. The preliminary lateral earth pressures on the sheeted excavations may be calculated using the earth pressure coefficients provided above in section 6.2.1

Prior to constructing the pump station foundation, the foundation excavation should be inspected by the geotechnical engineer to confirm that the footings are located in a competent bearing stratum, which has been cleaned of ponded water and loosened or softened material. The native sandy silty clay materials are considered slightly to medium sensitive to disturbance. Should it be necessary to keep foundation excavations open for an extended period of time, the bases should be protected with a working mat of lean concrete following approval of the founding surface by the geotechnical engineer.

6.5 Subsurface Walls

Any subsurface walls that may be installed as part of the infrastructure of this project will be subjected to unbalanced earth pressures and must be designed to resist a pressure that can be calculated based on the following equation:

$$P = K[\gamma(h-h_w) + \gamma' h_w + q] + \gamma_w h_w$$

where: P = horizontal pressure at depth

h = depth of soil from grade to top of footing (metres)

K = earth pressure coefficient

h_w = depth below groundwater level (metres)

γ = bulk unit weight of soil (kN/m^3)

γ' = submerged unit weight of the exterior soil

γ_w = unit weight of water

q = total surcharge loading from adjacent equipment and/or materials (kilopascals)

Perimeter drainage of the soils adjacent to any subsurface infrastructure or facility is typically recommended in order to effectively drain the granular backfill in order to eliminate the hydrostatic pressures acting on any walls and floors. For fully drained conditions, the previous equation can thereby be simplified to:

$$P = K(\gamma h + q)$$

An adequate perimeter drainage system will prevent seepage of groundwater through the walls of any subsurface structures and prevent build-up of excess hydrostatic pressure. This drainage system would typically consist of a perforated perimeter drainage pipe appropriately graded to sumps and either to gravity drainage off-site or pumps. The perforated drainage pipe should be encased in a geotextile filter fabric (“sock”) that is filter compatible with the granular backfill. In addition, the drainage pipe should be fully surrounded by a minimum of 0.3 metres of appropriately graded granular backfill material to provide appropriate filtration against migration of fine soil particles from the surrounding native soils. If a perimeter drain is considered infeasible due to the depth of the pump station and granular backfill is used, the backfill will hold water following precipitation events and the facility should be designed assuming full hydrostatic pressures and buoyant uplift with a water level coincident with the ground surface. It would be beneficial to backfill the upper 0.5 m of the excavation with native silty clay to limit the infiltration of surface water into the perimeter drainage system.

Alternatively, the pump station may be designed as a fully-waterproofed (i.e., “tanked”) structure, in which case full hydrostatic pressures and uplift should be considered in the design based on a groundwater level coincident with the ground surface.

Section 6.2.1 provides estimated soil parameter values for the native soils and common backfill materials for use in the preliminary design of the pump station.

6.6 Pavement Design

Prior to constructing any new pavement structures at the site, all uncontrolled fill, softened, loosened, organic and/or otherwise deleterious materials should be removed from within the limits of the proposed pavements. The exposed subgrade should be heavily proof-rolled with a non-vibratory steel wheel roller under the direction of the geotechnical engineer. Any excessively softened or loosened areas identified during this operation should be sub-excavated and backfilled with approved granular material compacted to at least 98 per cent SPMDD.

The pavement structure should consist of the following components and thicknesses supported on a competent, properly shaped and prepared subgrade.

Pavement Component	Thickness (millimetres)	
	Light Duty	Heavy Duty
HL3 Surface Asphalt	40	50
HL8 Binder Asphalt	50	65
OPSS Granular ‘A’ Base	300	150
OPSS Granular ‘B’ Type II Subbase	-	500

The granular base and subbase materials should be placed in maximum 300-millimetre-thick loose lifts and uniformly compacted to at least 100 per cent of SPMDD. The heavy duty pavement structure should be used in areas where use by vehicles with heavy axel loads are anticipated.

The asphalt should be produced, placed and compacted in accordance with the current OPSS requirements. Milled notches the thickness of the surface course by 500 millimetres wide should be provided where new construction abuts existing pavements and care should be taken to properly tack coat all milled surfaces and butt joints prior to the placement of new asphalt. Perforated stub drains should be provided at all catchbasin locations.

Construction activities should be coordinated to minimize the amount of construction traffic over the exposed subgrade soils and to minimize the impact of construction and/or through traffic on the granulars and placement of the asphaltic materials.

6.7 Geotechnical Monitoring, Inspections and Testing

The subsurface conditions encountered in the previous and current explorations in the area of the Site are generally typical of the Windsor and Essex County area. The development of a pump station at the Site is considered to be geotechnically feasible; no exceptional geotechnical development constraints have been identified.

Continued geotechnical involvement is required during the design and construction stages of this project. As preliminary design progresses, a site-specific geotechnical exploration and testing program should be carried out to address all infrastructure components. Geotechnical explorations for conventional shallow foundations should consist of at least one borehole at each structure foundation element and should extend to a minimum depth of approximately two to four times the width of the foundation below the expected foundation elevation, depending on the foundation geometry. Boreholes for any pipes or utilities should be advanced to a minimum depth of 1 metre below the pipe bedding bottom elevations and be spaced at regular intervals. If deep foundations are planned, geotechnical boreholes should be advanced to evaluate the depth and quality of the underlying rock (which typically subcrops at a depth of about 53 metres in the Project Area, based on available bedrock mapping). Typically, the upper 3 metres of bedrock in selected boreholes is cored to confirm the elevation of the bedrock surface and assess the quality and strength of the rock.

Following the completion of the exploration and testing program, the preliminary recommendations in this report may be revised/refined based on the new information.

During construction, a regular program of geotechnical inspections and testing should be carried out to confirm subsurface conditions consistent with those discussed herein and to ensure that the intent of the various design recommendations is met.

We trust that this draft report provides the preliminary geotechnical information currently required. Should any point require further clarification, please contact this office.

Signature Page

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Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the Client in the design of the specific project. The extent and detail of investigations, including the number of test holes, necessary to determine all of the relevant conditions which may affect construction costs would normally be greater than has been carried out for design purposes. Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.

Soil, Rock and Ground Water Conditions: Classification and identification of soils, rocks, and geologic units have been based on commonly accepted methods employed in the practice of geotechnical engineering and related disciplines. Classification and identification of the type and condition of these materials or units involves judgment, and boundaries between different soil, rock or geologic types or units may be transitional rather than abrupt. Accordingly, Golder does not warrant or guarantee the exactness of the descriptions.

Special risks occur whenever engineering or related disciplines are applied to identify subsurface conditions and even a comprehensive investigation, sampling and testing program may fail to detect all or certain subsurface conditions. The environmental, geologic, geotechnical, geochemical and hydrogeologic conditions that Golder interprets to exist between and beyond sampling points may differ from those that actually exist. In addition to soil variability, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties. The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report. The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.

Soil and groundwater conditions shown in the factual data and described in the report are the observed conditions at the time of their determination or measurement. Unless otherwise noted, those conditions form the basis of the recommendations in the report. Groundwater conditions may vary between and beyond reported locations and can be affected by annual, seasonal and meteorological conditions. The condition of the soil, rock and groundwater may be significantly altered by construction activities (traffic, excavation, groundwater level lowering, pile driving, blasting, etc.) on the site or on adjacent sites. Excavation may expose the soils to changes due to wetting, drying or frost. Unless otherwise indicated the soil must be protected from these changes during construction.

Sample Disposal: Golder will dispose of all uncontaminated soil and/or rock samples 90 days following issue of this report or, upon written request of the Client, will store uncontaminated samples and materials at the Client's expense. In the event that actual contaminated soils, fills or groundwater are encountered or are inferred to be present, all contaminated samples shall remain the property and responsibility of the Client for proper disposal.

Follow-Up and Construction Services: All details of the design were not known at the time of submission of Golder's report. Golder should be retained to review the final design, project plans and documents prior to construction, to confirm that they are consistent with the intent of Golder's report.

During construction, Golder should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not materially differ from those interpreted conditions considered in the preparation of Golder's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in Golder's report. Adequate field review, observation and testing during construction are necessary for Golder to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, Golder's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

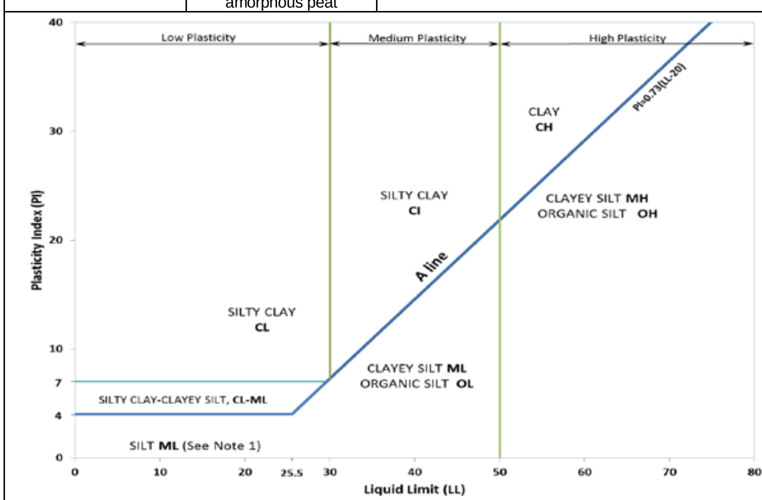
Changed Conditions and Drainage: Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that Golder be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that Golder be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.

Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. Golder takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.

The Golder Associates Ltd. Soil Classification System is based on the Unified Soil Classification System (USCS)

Organic or Inorganic	Soil Group	Type of Soil		Gradation or Plasticity	$Cu = \frac{D_{60}}{D_{10}}$	$Cc = \frac{(D_{30})^2}{D_{10}xD_{60}}$	Organic Content	USCS Group Symbol	Group Name
INORGANIC (Organic Content ≤30% by mass)	COARSE-GRAINED SOILS (>50% by mass is larger than 0.075 mm)	GRAVELS (>50% by mass of coarse fraction is larger than 4.75 mm)	Gravels with ≤12% fines (by mass)	Poorly Graded	<4	≤1 or ≥3	≤30%	GP	GRAVEL
				Well Graded	≥4	1 to 3		GW	GRAVEL
			Gravels with >12% fines (by mass)	Below A Line	n/a			GM	SILTY GRAVEL
				Above A Line	n/a			GC	CLAYEY GRAVEL
		SANDS (≥50% by mass of coarse fraction is smaller than 4.75 mm)	Sands with ≤12% fines (by mass)	Poorly Graded	<6	≤1 or ≥3		SP	SAND
				Well Graded	≥6	1 to 3		SW	SAND
			Sands with >12% fines (by mass)	Below A Line	n/a			SM	SILTY SAND
				Above A Line	n/a			SC	CLAYEY SAND

Organic or Inorganic	Soil Group	Type of Soil		Laboratory Tests	Field Indicators: Dilatancy	Dry Strength	Shine Test	Thread Diameter	Toughness (of 3 mm thread)	Organic Content	USCS Group Symbol	Primary Name
INORGANIC (Organic Content ≤30% by mass)	FINE-GRAINED SOILS (≥50% by mass is smaller than 0.075 mm)	SILTS	(Non-Plastic or PI and LL plot below A-Line on Plasticity Chart below)	Liquid Limit <50	Rapid	None	None	>6 mm	N/A (can't roll 3 mm thread)	<5%	ML	SILT
					Slow	None to Low	Dull	3mm to 6 mm	None to low	<5%	ML	CLAYEY SILT
					Slow to very slow	Low to medium	Dull to slight	3mm to 6 mm	Low	5% to 30%	OL	ORGANIC SILT
				Liquid Limit ≥50	Slow to very slow	Low to medium	Slight	3mm to 6 mm	Low to medium	<5%	MH	CLAYEY SILT
					None	Medium to high	Dull to slight	1 mm to 3 mm	Medium to high	5% to 30%	OH	ORGANIC SILT
		CLAYS	(PI and LL plot above A-Line on Plasticity Chart below)	Liquid Limit <30	None	Low to medium	Slight to shiny	~ 3 mm	Low to medium	0% to 30% **(see Note 2)**	CL	SILTY CLAY
				Liquid Limit 30 to 50	None	Medium to high	Slight to shiny	1 mm to 3 mm	Medium		CI	SILTY CLAY
				Liquid Limit ≥50	None	High	Shiny	<1 mm	High		CH	CLAY
HIGHLY ORGANIC SOILS (Organic Content >30% by mass)		Peat and mineral soil mixtures								30% to 75%	PT	SILTY PEAT, SANDY PEAT
		Predominantly peat, may contain some mineral soil, fibrous or amorphous peat								75% to 100%		PEAT



Note 1 – Fine grained materials with PI and LL that plot in this area are named (ML) SILT with slight plasticity. Fine-grained materials which are non-plastic (i.e. a PL cannot be measured) are named SILT.
Note 2 – For soils with <5% organic content, include the descriptor "trace organics" for soils with between 5% and 30% organic content include the prefix "organic" before the Primary name.

Dual Symbol — A dual symbol is two symbols separated by a hyphen, for example, GP-GM, SW-SC and CL-ML.
For non-cohesive soils, the dual symbols must be used when the soil has between 5% and 12% fines (i.e. to identify transitional material between "clean" and "dirty" sand or gravel.
For cohesive soils, the dual symbol must be used when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart (see Plasticity Chart at left).

Borderline Symbol — A borderline symbol is two symbols separated by a slash, for example, CL/CI, GM/SM, CL/ML.
A borderline symbol should be used to indicate that the soil has been identified as having properties that are on the transition between similar materials. In addition, a borderline symbol may be used to indicate a range of similar soil types within a stratum.

ABBREVIATIONS AND TERMS USED ON RECORDS OF BOREHOLES AND TEST PITS

PARTICLE SIZES OF CONSTITUENTS

Soil Constituent	Particle Size Description	Millimetres	Inches (US Std. Sieve Size)
BOULDERS	Not Applicable	>300	>12
COBBLES	Not Applicable	75 to 300	3 to 12
GRAVEL	Coarse Fine	19 to 75 4.75 to 19	0.75 to 3 (4) to 0.75
SAND	Coarse Medium Fine	2.00 to 4.75 0.425 to 2.00 0.075 to 0.425	(10) to (4) (40) to (10) (200) to (40)
SILT/CLAY	Classified by plasticity	<0.075	< (200)

MODIFIERS FOR SECONDARY AND MINOR CONSTITUENTS

Percentage by Mass	Modifier
>35	Use 'and' to combine major constituents (*i.e.,* SAND and GRAVEL)
> 12 to 35	Primary soil name prefixed with "gravelly, sandy, SILTY, CLAYEY" as applicable
> 5 to 12	some
≤ 5	trace

PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split-spoon sampler for a distance of 300 mm (12 in.). Values reported are as recorded in the field and are uncorrected.

Cone Penetration Test (CPT)
An electronic cone penetrometer with a 60° conical tip and a project end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and sleeve frictions are recorded electronically at 25 mm penetration intervals.

Dynamic Cone Penetration Resistance (DCPT); N_d:
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH: Sampler advanced by hydraulic pressure
PM: Sampler advanced by manual pressure
WH: Sampler advanced by static weight of hammer
WR: Sampler advanced by weight of sampler and rod

SAMPLES

AS	Auger sample
BS	Block sample
CS	Chunk sample
DD	Diamond Drilling
DO or DP	Seamless open ended, driven or pushed tube sampler – note size
DS	Denison type sample
GS	Grab Sample
MC	Modified California Samples
MS	Modified Shelby (for frozen soil)
RC	Rock core
SC	Soil core
SS	Split spoon sampler – note size
ST	Slotted tube
TO	Thin-walled, open – note size (Shelby tube)
TP	Thin-walled, piston – note size (Shelby tube)
WS	Wash sample

SOIL TESTS

w	water content
PL , w_p	plastic limit
LL , w_L	liquid limit
C	consolidation (oedometer) test
CHEM	chemical analysis (refer to text)
CID	consolidated isotropically drained triaxial test[1]
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	relative density (specific gravity, Gs)
DS	direct shear test
GS	specific gravity
M	sieve analysis for particle size
MH	combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	organic content test
SO_4	concentration of water-soluble sulphates
UC	unconfined compression test
UU	unconsolidated undrained triaxial test
V (FV)	field vane (LV-laboratory vane test)
γ	unit weight

1. Tests anisotropically consolidated prior to shear are shown as CAD, CAU.

NON-COHESIVE (COHESIONLESS) SOILS

Compactness[2]

Term	SPT 'N' (blows/0.3m)[1]
Very Loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	>50

1. SPT 'N' in accordance with ASTM D1586, uncorrected for the effects of overburden pressure.
2. Definition of compactness terms are based on SPT 'N' ranges as provided in Terzaghi, Peck and Mesri (1996). Many factors affect the recorded SPT 'N' value, including hammer efficiency (which may be greater than 60% in automatic trip hammers), overburden pressure, groundwater conditions, and grainsize. As such, the recorded SPT 'N' value(s) should be considered only an approximate guide to the soil compactness. These factors need to be considered when evaluating the results, and the stated compactness terms should not be relied upon for design or construction.

Field Moisture Condition

Term	Description
Dry	Soil flows freely through fingers.
Moist	Soils are darker than in the dry condition and may feel cool.
Wet	As moist, but with free water forming on hands when handled.

COHESIVE SOILS

Consistency

Term	Undrained Shear Strength (kPa)	SPT 'N'[1,2] (blows/0.3m)
Very Soft	<12	0 to 2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	>200	>30

1. SPT 'N' in accordance with ASTM D1586, uncorrected for overburden pressure effects; approximate only.
2. SPT 'N' values should be considered ONLY an approximate guide to consistency; for sensitive clays (e.g., Champlain Sea clays), the N-value approximation for consistency terms does NOT apply. Rely on direct measurement of undrained shear strength or other manual observations.

Water Content

Term	Description
w < PL	Material is estimated to be drier than the Plastic Limit.
w ~ PL	Material is estimated to be close to the Plastic Limit.
w > PL	Material is estimated to be wetter than the Plastic Limit.

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$	x or log x, logarithm of x to base 10
g	acceleration due to gravity
t	time

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta\,\sigma$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
υ	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma$ - u)
σ'_{vo}	initial effective overburden stress
$\sigma_1, \sigma_2, \sigma_3$	principal stress (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3)/3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) (formerly G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_l or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity index = $(w_l - w_p)$
NP	non-plastic
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_C	consistency index = $(w_l - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (over-consolidated range)
C_s	swelling index
C_α	secondary compression index
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
c_h	coefficient of consolidation (horizontal direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	over-consolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p, τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c′	effective cohesion
c_u, s_u	undrained shear strength (ϕ = 0 analysis)
p	mean total stress $(\sigma_1 + \sigma_3)/2$
p′	mean effective stress $(\sigma'_1 + \sigma'_3)/2$
q	$(\sigma_1 - \sigma_3)/2$ or $(\sigma'_1 - \sigma'_3)/2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes: 1 $\tau = c' + \sigma' \tan \phi'$
2 shear strength = (compressive strength)/2

PROJECT: 21482896

RECORD OF BOREHOLE BH-101

SHEET 1 OF 2

LOCATION: N 4688628.0 , E 338898.0

BORING DATE: October 4, 2021
DRILLING CONTRACTOR: Henderson Drilling Inc.

DATUM: LOCAL

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

BORING METHOD: POWER AUGER, 83mm ID HOLLOW STEM

DESCRIPTION	ELEV. / DEPTH (m)
GROUND SURFACE	100.76 / 0.00
TOPSOIL, sandy silty clay, with rootlets; dark brown	0.10
FILL, sandy silty clay, trace gravel, with organics, topsoil layers, and cobbles, black sand pocket at about elev. 99.2m; soft to stiff	98.63 / 2.13
FILL, sand and gravel, some silt, with clay pockets; dark grey	98.32 / 2.44
(CL) sandy **SILTY CLAY**, trace gravel; mottled brown and grey; stiff to very stiff	97.03 / 3.73
(CL) sandy **SILTY CLAY**, trace gravel, with oxidized fissures; brown, very stiff	95.12 / 5.64
(CL) sandy **SILTY CLAY**, trace gravel,with sand layers; grey; very soft to firm	

NUMBER	TYPE	BLOWS/0.3m	HEX / IBL
1	SS	3	0 / 0
2	SS	12	0 / 0
3	SS	7	0 / 0
4	SS	8	5 / 0
5	SS	21	0 / 0
6	SS	21	5 / 0
7	SS	20	0 / 0
8	SS	8	0 / 0
9	SS	WH	0 / 0
10	SS	WH	0 / 0

DEPTH SCALE METRES: 0 1 2 3 4 5 6 7 8 9 10

ELEVATION: 100 99 98 97 96 95 94 93 92 91

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ : 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT: Wp W Wl : 10 20 30 40

ADDITIONAL LAB. TESTING

INSTALLATION AND GROUNDWATER OBSERVATIONS

--- CONTINUED NEXT PAGE ---

DEPTH SCALE 1 : 50

GOLDER MEMBER OF WSP

LOGGED: AM
CHECKED: MH

LDN_BHS_07 21482896.GPJ GLDR_LON.GDT 29/10/21 12:16 DATA INPUT: AM

RECORD OF BOREHOLE BH-101

PROJECT: 21482896

LOCATION: N 4688628.0 , E 338898.0

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

BORING DATE: October 4, 2021

DRILLING CONTRACTOR: Henderson Drilling Inc.

DATUM: LOCAL

--- CONTINUED FROM PREVIOUS PAGE ---

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	ELEV. DEPTH (m)	SAMPLE NUMBER	TYPE	BLOWS/0.3m	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH Cu, kPa	WATER CONTENT PERCENT	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
10–15.85	POWER AUGER 83mm ID HOLLOW STEM	(CL) sandy **SILTY CLAY**, trace gravel,with sand layers; grey; very soft to firm									
11				11	SS	WH	90	0/1			
12				12	SS	WH	89 / 88	0/0		MH	
14				13	SS	WH	87	0/0			Enc. WL Groundwater encountered at about elev. 86.7m during drilling on October 4, 2021
15				14	SS	WH	86 / 85	0/0			
15.85		END OF BOREHOLE	84.91 15.85				84				

Legend: SHEAR STRENGTH Cu, kPa — nat V. + Q - ● rem V. ⊕ U - ○; WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl; HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3}

DEPTH SCALE

1 : 50

GOLDER MEMBER OF WSP

LOGGED: AM

CHECKED: MH

LDN_BHS_07 21482896.GPJ GLDR_LON.GDT 29/10/21 12:16 DATA INPUT: AM

RECORD OF BOREHOLE BH-102A

PROJECT: 21482896
LOCATION: N 4688657.0 , E 338886.0
SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

BORING DATE: October 4, 2021
DRILLING CONTRACTOR: Henderson Drilling Inc.

SHEET 1 OF 1
DATUM: LOCAL

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp —○W— Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
0		GROUND SURFACE		100.63					HEX / IBL			
	POWER AUGER, 83mm ID HOLLOW STEM	**TOPSOIL**, sandy silty clay, with rootlets; dark brown		0.00								
		FILL, sandy silty clay, trace gravel, with organics and cobbles; brown to dark brown; stiff		0.15	1	SS	11	100	0 / 0	○		Borehole dry during drilling on October 4, 2021
1					2	SS	9		0 / 0	○		
				98.95	3	SS	58/152mm					
		END OF BOREHOLE AUGER REFUSAL		1.68								
2								98				
3												
4												
5												
6												
7												
8												
9												
10												

LDN_BHS_07 21482896.GPJ GLDR_LON.GDT 29/10/21 12:16 DATA INPUT: AM

DEPTH SCALE
1 : 50

GOLDER
MEMBER OF WSP

LOGGED: AM
CHECKED: MH

RECORD OF BOREHOLE BH-102B

PROJECT: 21482896
LOCATION: N 4688656.0 , E 338886.0
SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

BORING DATE: October 4, 2021
DRILLING CONTRACTOR: Henderson Drilling Inc.

DATUM: LOCAL

BORING METHOD: POWER AUGER, 83mm ID HOLLOW STEM

Description	Elev. / Depth (m)
Stratigraphy from 0 to 1.52m inferred from BH-102A	
GROUND SURFACE	100.63
TOPSOIL, sandy silty clay, with rootlets; dark brown	0.00
FILL, sandy silt clay, trace gravel, with organics and cobbles; brown to dark brown; stiff	0.15
FILL, sandy silt clay, trace gravel, with organics and cobbles; grey; firm	99.11 / 1.52
(CL) sandy **SILTY CLAY**, trace gravel; grey and mottled brown; firm	98.04 / 2.59
(CL) sandy **SILTY CLAY**, trace gravel, with oxidized fissures; brown; stiff to very stiff	97.74 / 2.89
(CL-ML) sandy **SILTY CLAY** to **CLAYEY SILT**, trace gravel, with sand layers; grey; very soft to firm	94.99

Sample Number	Type	Blows/0.3m	Dynamic Penetration
			HEX / IBL
1	SS	4	0/0
2	SS	5	0/0
3	SS	16	0/0
4	SS	19	0/0
5	SS	13	0/1
6	SS	2	0/0
7	SS	WH	0/0
8	SS	1	0/0

--- CONTINUED NEXT PAGE ---

DEPTH SCALE 1 : 50

GOLDER MEMBER OF WSP

LOGGED: AM
CHECKED: MH

PROJECT: 21482896

RECORD OF BOREHOLE BH-102B

LOCATION: N 4688656.0 , E 338886.0

BORING DATE: October 4, 2021
DRILLING CONTRACTOR: Henderson Drilling Inc.

DATUM: LOCAL

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢ ○W ⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
		--- CONTINUED FROM PREVIOUS PAGE ---										
	POWER AUGER 83mm ID HOLLOW STEM	(CL-ML) sandy **SILTY CLAY** to **CLAYEY SILT**, trace gravel, with sand layers; grey; very soft to firm			8	SS	1	91				
10												
								90				
11					9	SS	2		0/0		MH	
								89				
12												
					10	SS	WH		5/1			Enc. WL
				87.83				88				Groundwater encountered at about elev. 88.1m during drilling on October 4, 2021
		END OF BOREHOLE		12.80								
13												
								87				
14												
15												
16												
17												
18												
19												

DEPTH SCALE

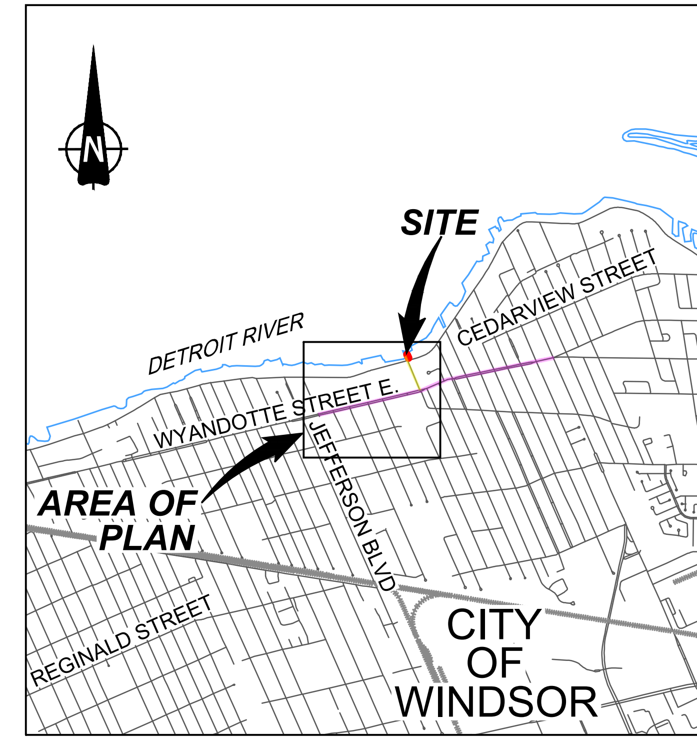
1 : 50

GOLDER
MEMBER OF WSP

LOGGED: AM

CHECKED: MH

LDN_BHS_07 21482896.GPJ GLDR_LON.GDT 29/10/21 12:16 DATA INPUT: AM



KEY PLAN

LEGEND

BOREHOLE (CURRENT INVESTIGATION)

BOREHOLE (PREVIOUS GOLDER REPORTS):

1899798

APPROXIMATE STUDY AREA OF PREVIOUS (1973) EXPLORATIONS:

BOREHOLES 1-6 (DEC. 1973, REPORT No. 73666)

BOREHOLES 1-14 (JUNE 1973, REPORT No. 73572)

REFERENCE

DRAWING BASED ON 2021 AERIAL IMAGE FROM ESSEX COUNTY INTERACTIVE MAP, BY PERMISSION;
ST. ROSE PUMP STATION LAYOUT SCHEMATIC, DILLON CONSULTING, PROVIDED BY STANTEC CONSULTING LTD, JULY 20, 2021; AND
CANMAP STREETFILES V2008.4.

NOTES

THIS DRAWING IS SCHEMATIC ONLY AND IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

ALL LOCATIONS ARE APPROXIMATE.

PROJECT

GEOTECHNICAL ASSESSMENT AND PRELIMINARY EXPLORATION AND TESTING PROGRAM
PROPOSED ST. ROSE PUMP STATION
WINDSOR, ONTARIO

TITLE

LOCATION PLAN (WEST OF ST. ROSE AVENUE)

GOLDER
MEMBER OF WSP

PROJECT No.	21482896	FILE No	21482896-1000-R01001
		SCALE	AS SHOWN
		REV.	
CADD	AM	Dec 16/21	
CHECK	MH		

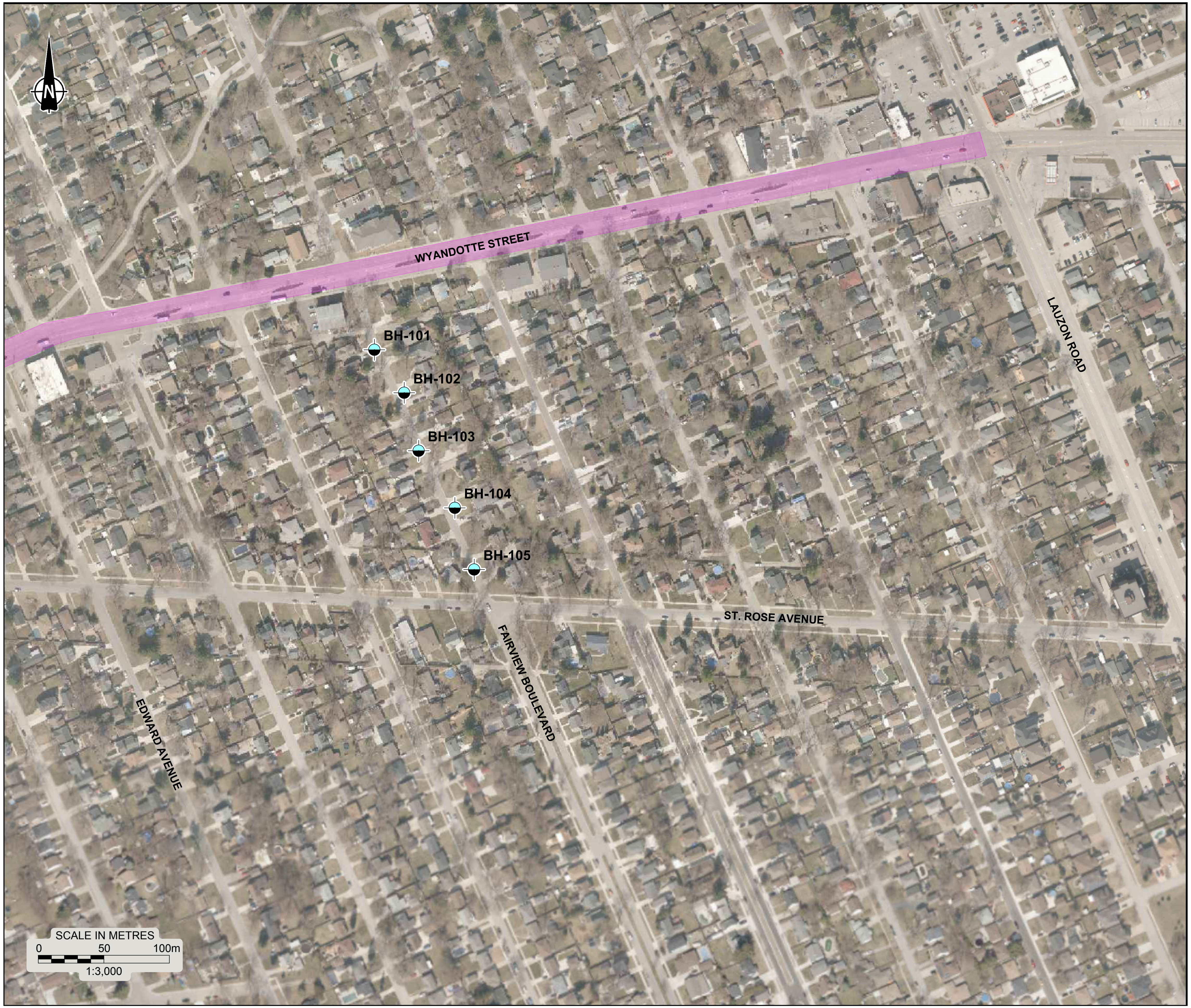
FIGURE 1

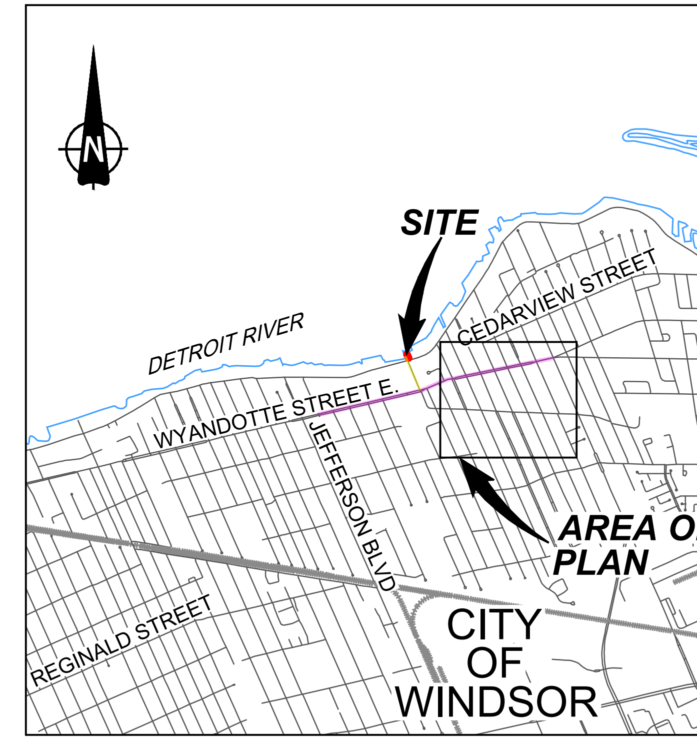
Client: Stantec

Original Format is Tabloid 279mm x 432mm

25mm 0

Drawing file: 21482896-1000-R01001.dwg Dec 16, 2021 – 3:15pm





KEY PLAN

LEGEND

BOREHOLE (CURRENT INVESTIGATION)

BOREHOLE (PREVIOUS GOLDER REPORTS):

13-1140-0026

APPROXIMATE STUDY AREA OF PREVIOUS (1973) EXPLORATIONS:

BOREHOLES 1-6 (DEC. 1973, REPORT No. 73666)

BOREHOLES 1-14 (JUNE 1973, REPORT No. 73572)

REFERENCE

DRAWING BASED ON 2021 AERIAL IMAGE FROM ESSEX COUNTY INTERACTIVE MAP, BY PERMISSION;
ST. ROSE PUMP STATION LAYOUT SCHEMATIC, DILLON CONSULTING, PROVIDED BY STANTEC CONSULTING LTD, JULY 20, 2021; AND
CANMAP STREETFILES V2008.4.

NOTES

THIS DRAWING IS SCHEMATIC ONLY AND IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.
ALL LOCATIONS ARE APPROXIMATE.

PROJECT

GEOTECHNICAL ASSESSMENT AND PRELIMINARY EXPLORATION AND TESTING PROGRAM
PROPOSED ST. ROSE PUMP STATION
WINDSOR, ONTARIO

TITLE

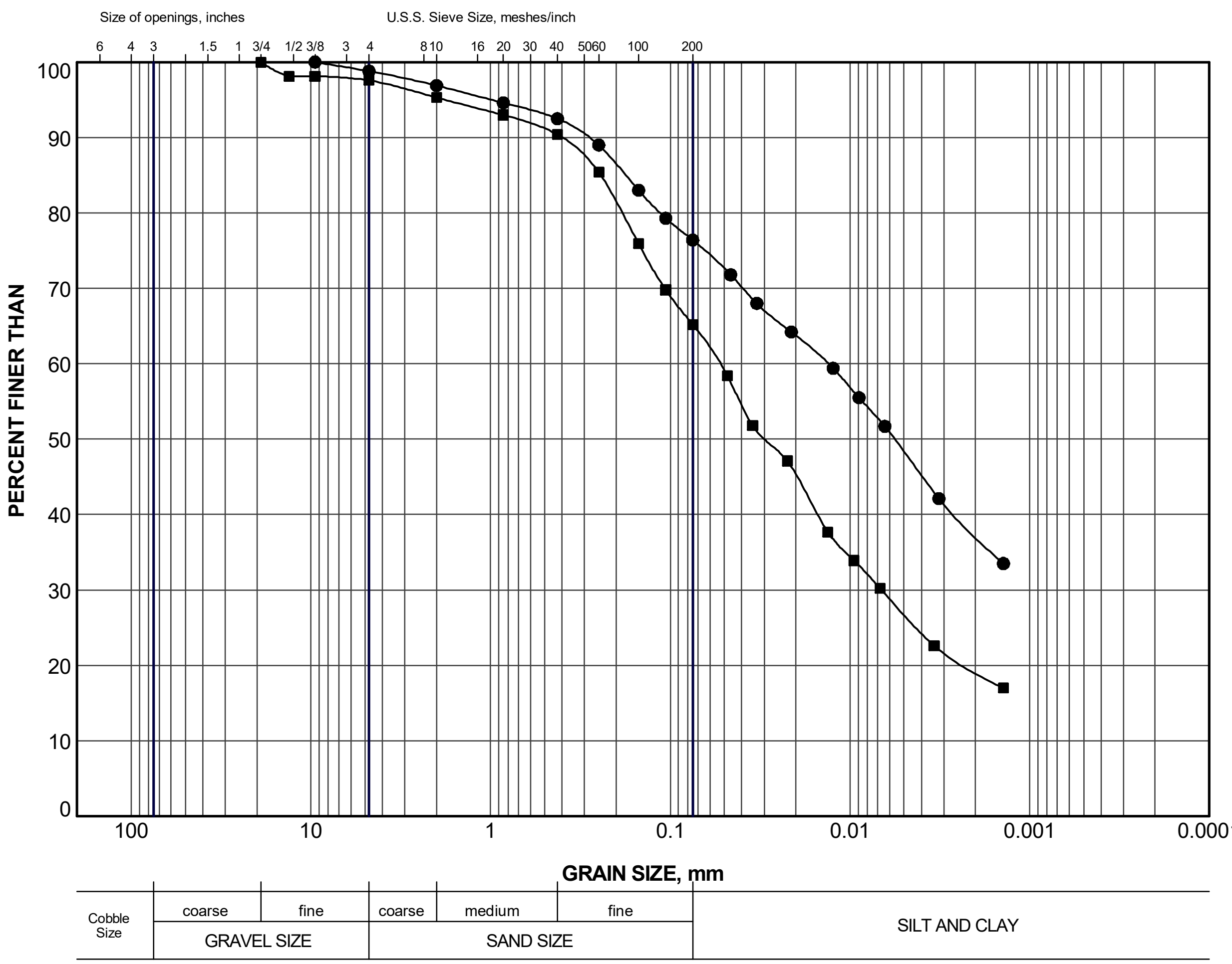
LOCATION PLAN (EAST OF ST. ROSE AVENUE)

GOLDER
MEMBER OF WSP

PROJECT No.	21482896	FILE No.	21482896-1000-R01001
		SCALE	AS SHOWN
CADD	AM	Dec 16/21	REV.
CHECK	MH		

FIGURE 2

Client: Stantec
Original Format is Tabloid 279mm x 432mm
Dec 16, 2021 – 3:18pm
Drawing file: 21482896-1000-R01001.dwg



LEGEND

SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	BH-101	12	88.3
■	BH-102B	9	89.7

PROJECT
GEOTECHNICAL ASSESSMENT AND PRELIMINARY EXPLORATION AND TESTING PROGRAM
PROPOSED ST. ROSE PUMP STATION
WINDSOR, ONTARIO

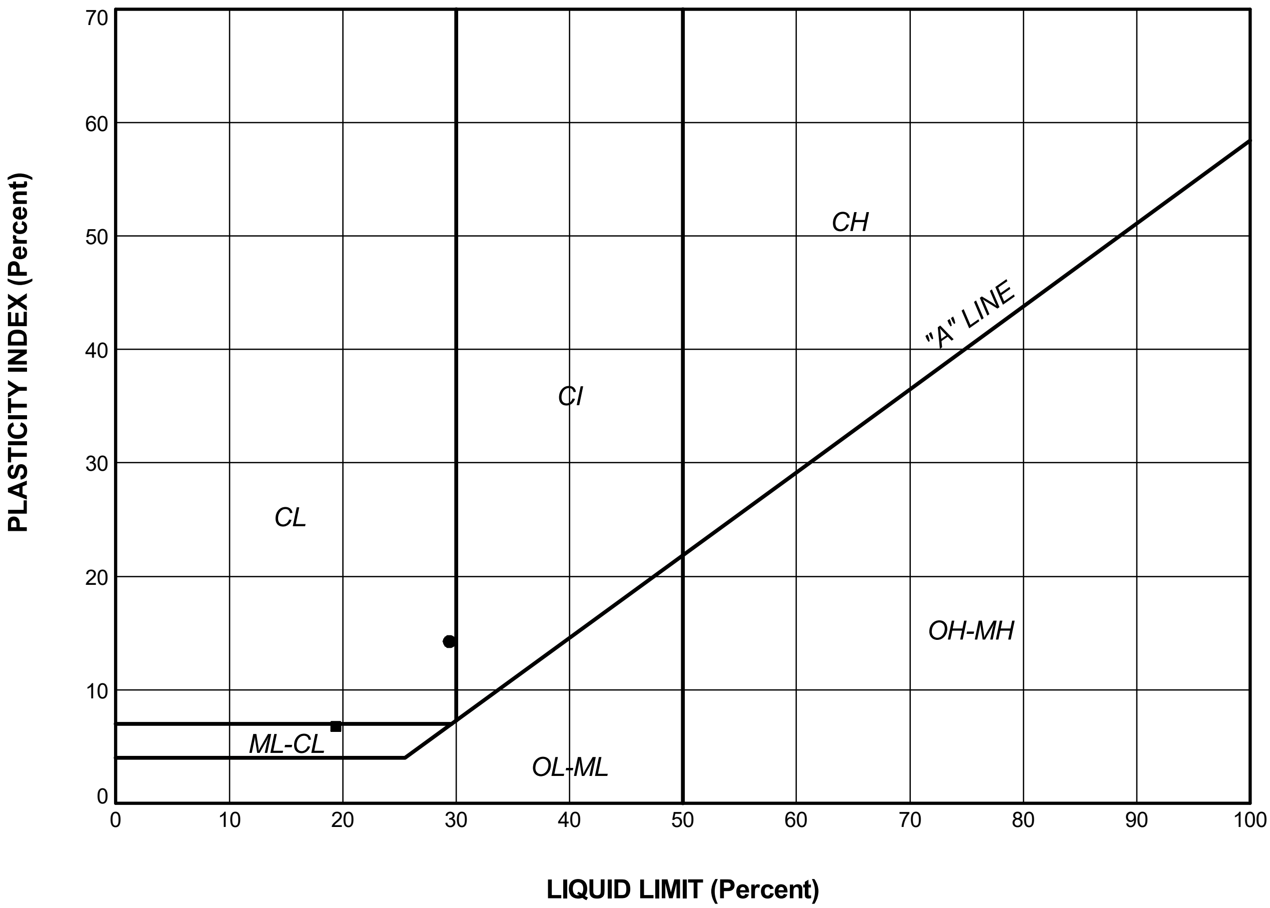
TITLE

GRAIN SIZE DISTRIBUTION
sandy SILTY CLAY to CLAYEY SILT

GOLDER
MEMBER OF WSP

PROJECT No.		21482896	FILE No.	21482896-1000-R01003
			SCALE N/A	REV.
DRAWN	AM	Dec 14/21	FIGURE 3	
CHECK	MH			

LDN_GSD GLDR_LDN.GDT 14/12/21 13:21



SOIL TYPE
C = Clay
M = Silt
O = Organic

PLASTICITY
L = Low
I = Intermediate
H = High

LEGEND

SYMBOL	BOREHOLE	SAMPLE	LL(%)	PL(%)	PI
●	BH-101	12	29.4	15.2	14.3
■	BH-102B	9	19.4	12.7	6.8

PROJECT	GEOTECHNICAL ASSESSMENT AND PRELIMINARY EXPLORATION AND TESTING PROGRAM PROPOSED ST. ROSE PUMP STATION WINDSOR, ONTARIO
TITLE	**PLASTICITY CHART**

GOLDER MEMBER OF WSP

PROJECT No.		21482896	FILE No.	21482896-1000-R01004
			SCALE N/A	REV.
DRAWN	AM	Dec 14/21	**FIGURE 4**	
CHECK	MH			

LDN_PI GLDR_LON.GDT 14/12/21 13:27

APPENDIX A

Records of Previous Boreholes

Form G.A. - D - 1

Project No. 73572

RECORD OF BOREHOLE 1

LOCATION See Figure 2 BORING DATE JUNE 4 & 8, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

Boring method: POWER AUGER 4.5" DIA. (UNCASED)

ELEV'N. DEPTH	DESCRIPTION	SAMPLE NUMBER	TYPE	BLOWS/FT.	WATER CONTENT, PERCENT (approx.)
581.8	ROAD SURFACE				
0.0	ASPHALT				
0.3	COMPACT BROWN SAND & GRAVEL (BASECOURSE)	1	2" D.O.	14	
580.0 / 1.8	STIFF BROWN & GREY MOTTLED SILTY CLAY SOME SAND TR. GRAVEL	2	"	11	
578.5 / 3.3	VERY STIFF BECOMING HARD BROWN SILTY CLAY SOME SAND TR. GRAVEL (TILL-LIKE)	3	"	22	
		4	"	35	
		5	"	30	
569.3 / 12.5	VERY STIFF BECOMING STIFF GREY SILTY CLAY SOME SAND TR. GRAVEL (TILL-LIKE)	6	"	19	
		7	"	14	
		8	"	10	
559.8 / 22.0	END OF HOLE				

ELEVATION SCALE: 585, 580, 575, 570, 565, 560

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + Q. - ● REM.V. - ● U. - O
500 1000 1500 2000

COEFFICIENT OF PERMEABILITY, K., CM./SEC. 1x10 1x10 1x10 1x10

WATER CONTENT, PERCENT Wp W Wl
10 20 30 40

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

ROAD SURFACE

CLAY BACKFILL

PLASTIC TUBING

JUNE 26/73

GRANULAR MATERIAL

PERFORATED STANDPIPE

BOREHOLE DRY DURING DRILLING

WATER LEVEL IN STANDPIPE AT ELEV. 575.3 JUNE 26, 1973

15 0 5 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.

Golder Associates

DRAWN AKD

CHECKED BRG

Form G.A. - D - 1

Project No. 73572

RECORD OF BOREHOLE 2

LOCATION See Figure 2 BORING DATE JUNE 4 & 11, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD: POWER AUGER 4.5" DIA. (UNCASED)

ELEV'N. DEPTH	DESCRIPTION	SAMPLE NUMBER	TYPE	BLOWS/FT.
581.2	ROAD SURFACE			
0.0	ASPHALT			
0.3	BROWN SAND & GRAVEL (BASECOURSE)	1	2" D.O.	14
1.0	STIFF BROWN SILTY CLAY & ORGANIC MATTER (FILL)	2	"	10
		3	"	14
576.3 / 4.9	STIFF BROWN & GREY MOTTLED SILTY CLAY SOME SAND TR. GRAVEL	4	"	17
574.9 / 6.3	HARD BROWN SILTY CLAY SOME SAND, TR. GRAVEL (TILL-LIKE)	5	"	32
568.9 / 12.3	HARD BECOMING VERY STIFF GREY SILTY CLAY SOME SAND TR. GRAVEL (TILL-LIKE)	6	"	33
		7	"	30
		8	"	19
560.7 / 20.5	END OF HOLE			

ELEVATION SCALE: 585, 580, 575, 570, 565, 560

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + Q. - ● REM.V. - ⊕ U. - O

COEFFICIENT OF PERMEABILITY, K., CM./SEC. 1x10 1x10 1x10 1x10

WATER CONTENT, PERCENT W_P W W_L 10 20 30 40

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

ROAD SURFACE

CLAY BACKFILL

PLASTIC TUBING

JUNE 26/73

GRANULAR MATERIAL

PERFORATED STANDPIPE

BOREHOLE DRY DURING DRILLING

WATER LEVEL IN STANDPIPE AT ELEV. 565.2 JUNE 26, 1973

0 / 15 / 5 / 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.

Golder Associates

DRAWN AVD

CHECKED BRG

Form G.A. - D - 1

Project No. 73572

RECORD OF BOREHOLE 3

LOCATION See Figure 3   BORING DATE JUNE 4 & 8, 1973   DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.   PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD: POWER AUGER 4.5" DIA. (UNCASED)

SOIL PROFILE: ELEV'N. DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES: NUMBER	TYPE	BLOWS/FT.	ELEVATION SCALE	ADDITIONAL LAB. TESTING
579.6	ROAD SURFACE					580	
0.0	ASPHALT						
0.3	CONCRETE BASE SLAB						
1.0	BROWN SAND & GRAVEL (BASE COURSE)						
1.3	VERY STIFF BECOMING HARD BROWN SILTY CLAY SOME SAND, TR. GRAVEL (TILL-LIKE)		1	2" D.O.	16		
			2	"	24		
			3	"	36	575	
			4	"	49		
						570	
			5	"	31		
567.1 12.5	VERY STIFF BECOMING STIFF GREY SILTY CLAY SOME SAND, TR. GRAVEL (TILL-LIKE)						
			6	"	22		MH
						565	
			7	"	14		
			8	"	10	560	
557.6 22.0	END OF HOLE						
						555	

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + Q. - ● REM.V. - ⊕ U. - O 500 1000 1500 2000

COEFFICIENT OF PERMEABILITY, K., CM./SEC. 1x10 1x10 1x10 1x10

WATER CONTENT, PERCENT Wp W WL 10 20 30 40

PIEZOMETER OR STANDPIPE INSTALLATION

ROAD SURFACE

CLAY BACKFILL

PLASTIC TUBING

JUNE 26/73

GRANULAR MATERIAL

PERFORATED STANDPIPE

BOREHOLE DRY DURING DRILLING

WATER LEVEL IN STANDPIPE AT ELEV. 563.6 JUNE 26, 1973

0 / 5 / 10 / 15 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.

Golder Associates

DRAWN [illegible]

CHECKED BRG

Form G.A. - D - I

Project No. 73572

RECORD OF BOREHOLE 4

LOCATION See Figure 1 BORING DATE JUNE 5 & 11, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD	ELEV'N. / DEPTH	SOIL PROFILE DESCRIPTION	SAMPLE NUMBER	TYPE	BLOWS/FT.
POWER AUGER 4.5" DIA. (UNCASED)	579.6	ROAD SURFACE			
	0.0	ASPHALT			
	0.5	CONCRETE			
	577.9 / 1.7	BASE SLAB			
	2.0	STIFF BLACK TO DARK BROWN SILTY CLAY & ORGANIC MATTER (FILL)	1	2" DO.	12
	575.6 / 4.0		2	"	11
			3	"	19
		VERY STIFF BECOMING HARD BROWN SILTY CLAY, SOME SAND, TR. GRAVEL (TILL-LIKE)	4	"	38
			5	"	23
	567.5 / 12.1	VERY STIFF BECOMING STIFF GREY SILTY CLAY, SOME SAND, TR. GRAVEL (TILL-LIKE)	6	"	26
			7	"	13
			8	"	10
	559.1 / 20.5	END OF HOLE			

ELEVATION SCALE: 580, 575, 570, 565, 560, 555

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + Q. - ● REM.V. - ⊕ U. - O

[BROWN SAND & GRAVEL (BASE COURSE)]

COEFFICIENT OF PERMEABILITY, K., CM./SEC. 1x10 1x10 1x10 1x10

WATER CONTENT, PERCENT W_p W W_L

10 20 30 40

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

ROAD SURFACE

CLAY BACKFILL

PLASTIC TUBING

JUNE 26/73

GRANULAR MATERIAL

PERFORATED STANDPIPE

BOREHOLE DRY DURING DRILLING

WATER LEVEL IN STANDPIPE AT ELEV. 570.1 JUNE 26, 1973

15 0 5 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.

Golder Associates

DRAWN [illegible]

CHECKED BRG

Form G.A. - D - I

Project No. 73572

RECORD OF BOREHOLE 5

LOCATION See Figure 3 | BORING DATE JUNE 5 & 11, 1973 | DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. | PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

Column headings: BORING METHOD | SOIL PROFILE: ELEV'N. / DEPTH, DESCRIPTION, STRAT. PLOT | SAMPLES: NUMBER, TYPE, BLOWS/FT. | ELEVATION SCALE | DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. (20, 40, 60, 80) / SHEAR STRENGTH Cu., LB./SQ.FT. (500, 1000, 1500, 2000), NAT. V. - +, REM.V. - ●, Q. - ●, U. - O | COEFFICIENT OF PERMEABILITY, K., CM./SEC. (1x10, 1x10, 1x10, 1x10) / WATER CONTENT, PERCENT, Wp W WL (10, 20, 30, 40) | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION

Boring method: POWER AUGER 4.5" DIA. (UNCASED)

ELEV'N. / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS/FT.
578.7 / 0.0	ROAD SURFACE ASPHALT			
0.3	COMPACT BECOMING VERY LOOSE BROWN SAND & GRAVEL (FILL)	1	2" D.O.	21
		2	"	12
		3	"	6
		4	"	7
		5	"	*
565.8 / 12.9	FIRM GREY SILTY CLAY SOME SAND, TR. GRAVEL (TILL-LIKE)	6	"	5
		7	"	5
		8	"	7
558.2 / 20.5	END OF HOLE			

Elevation scale: 580, 575, 570, 565, 560, 555

Piezometer or standpipe installation: GROUND SURFACE; CLAY BACKFILL; PLASTIC TUBING; JUNE 11/73; JUNE 26/73; GRANULAR MATERIAL; PERFORATED STANDPIPE

WATER LEVEL IN OPEN BOREHOLE AT ELEV. 571.7 JUNE 11, 1973

WATER LEVEL IN STANDPIPE AT ELEV. 569.7 JUNE 26, 1973

* NOTE: SPLIT SPOON SAMPLER ADVANCED BY WEIGHT OF DRILL RODS

0 / 15 / 5 / 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.

Golder Associates

DRAWN AVD

CHECKED BRG

Form G.A. - D - I

Project No. 73572

RECORD OF BOREHOLE 6

LOCATION See Figure 3 BORING DATE JUNE 5 & 8, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD	ELEV'N. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FT.
POWER AUGER 4.5" DIA. (UNCASED)	578.9 0.0	ROAD SURFACE				
	577.8 1.1	ASPHALT				
	1.5	BROWN SAND & GRAVEL (BASECOURSE)				
	574.6 4.3	STIFF BROWN & GREY MOTTLED **SILTY CLAY** SOME SAND, TR. GRAVEL		1	2" D.O	8
				2	"	10
	566.1 12.8	VERY STIFF TO HARD BROWN **SILTY CLAY** SOME SAND, TR. GRAVEL (TILL-LIKE)		3	"	25
				4	"	41
				5	"	23
	558.4 20.5	VERY STIFF GREY **SILTY CLAY** SOME SAND TR. GRAVEL (TILL-LIKE)		6	"	18
				7	"	13
				8	"	11
		END OF HOLE				

ELEVATION SCALE: 580, 575, 570, 565, 560, 555

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT.	COEFFICIENT OF PERMEABILITY, K., CM./SEC.
20 40 60 80	1x10 1x10 1x10 1x10
SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + Q. - ● REM.V. - ⊕ U. - O	WATER CONTENT, PERCENT W_p W W_L 10 20 30 40

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION:

- ROAD SURFACE
- CLAY BACKFILL
- JUNE 26/73
- PLASTIC TUBING
- GRANULAR MATERIAL
- PERFORATED STANDPIPE
- BOREHOLE DRY DURING DRILLING
- WATER LEVEL IN STANDPIPE AT ELEV. 575.4 JUNE 26, 1973

15 0 5 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.	Golder Associates	DRAWN [illegible] CHECKED BRG

Form G.A. - D - 1

Project No. 73572

RECORD OF BOREHOLE 7

LOCATION See Figure 4 BORING DATE JUNE 5 & 8, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD: POWER AUGER 4.5' DIA. (UNCASED)

ELEV'N. DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS/FT.	WATER CONTENT, PERCENT (approx.)	PIEZOMETER OR STANDPIPE INSTALLATION
578.0 / 0.0	ROAD SURFACE ASPHALT					ROAD SURFACE
0.4	CONCRETE BASE SLAB					
0.9	BROWN SAND & GRAVEL (BASECOURSE)					
1.1	STIFF BECOMING VERY STIFF BROWN & GREY MOTTLED	1	2" D.O.	11	⊙	CLAY BACKFILL
		2	"	24	⊙	
574.0 / 4.0	SILTY CLAY SOME SAND, TR. GRAVEL	3	"	38	⊙	JUNE 26/73
	HARD BECOMING VERY STIFF BROWN SILTY CLAY SOME SAND TR. GRAVEL (TILL-LIKE)	4	"	30	⊙	PLASTIC TUBING
		5	"	30	⊙	
		6	"	26	⊙	
562.7 / 15.3	VERY STIFF BECOMING STIFF GREY SILTY CLAY SOME SAND TR. GRAVEL (TILL-LIKE)	7	"	16	⊙	PERFORATED STANDPIPE
		8	"	11	⊙	GRANULAR MATERIAL
557.5 / 20.5	END OF HOLE					BOREHOLE DRY DURING DRILLING

ELEVATION SCALE: 580, 575, 570, 565, 560, 555

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V.- + Q.-● REM.V.- ● U.-O

COEFFICIENT OF PERMEABILITY, K., CM./SEC. 1x10 1x10 1x10 1x10

WATER CONTENT, PERCENT Wp W WL 10 20 30 40

ADDITIONAL LAB. TESTING

WATER LEVEL IN STANDPIPE AT ELEV. 574.0 JUNE 26, 1973

15 0 5 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.

Golder Associates

DRAWN AWD

CHECKED BRG

Form G.A. - D - 1

Project No. 73572

RECORD OF BOREHOLE 8

LOCATION See Figure 4 BORING DATE JUNE 5 & 8, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD	ELEV'N. DEPTH	SOIL PROFILE DESCRIPTION	SAMPLES NUMBER	TYPE	BLOWS/FT.	ELEVATION SCALE	WATER CONTENT, PERCENT (W)	PIEZOMETER OR STANDPIPE INSTALLATION
						580		ROAD SURFACE
POWER AUGER 4.5" DIA. (UNCASED)	577.7	ROAD SURFACE						
	0.0	ASPHALT						
	0.3	CONCRETE						
	1.1	BASE SLAB						
	1.3	STIFF BROWN & GREY MOTTLED SILTY CLAY SOME SAND, TR. GRAVEL	1	2" D.O.	13		⊙	CLAY BACKFILL
			2	"	10	575	⊙	
			3	"	14		⊙	JUNE 26/73
	572.2 / 5.5	VERY STIFF BROWN SILTY CLAY SOME SAND TR. GRAVEL (TILL-LIKE)	4	"	21		⊙	PLASTIC TUBING
						570		
			5	"	29		⊙	
	565.1 / 12.6	VERY STIFF BECOMING STIFF GREY SILTY CLAY SOME SAND. TR. GRAVEL (TILL-LIKE)				565		
			6	"	25		⊙	
			7	"	13		⊙	GRANULAR MATERIAL
						560		PERFORATED STANDPIPE
			8	"	11			
	555.7 / 22.0	END OF HOLE				555		BOREHOLE DRY DURING DRILLING

Column headings: DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. 20 40 60 80; SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + Q. - ● REM. V. - ⊕ U. - O; 500 1000 1500 2000; COEFFICIENT OF PERMEABILITY, K., CM./SEC. 1x10 1x10 1x10 1x10; WATER CONTENT, PERCENT W_p W W_L 10 20 30 40; ADDITIONAL LAB. TESTING; STRAT. PLOT

BROWN SAND & GRAVEL (BASECOURSE)

ATTEMPTED VANE TEST AT ELEV. 556.2 MATERIAL TOO STIFF FOR TEST

WATER LEVEL IN STANDPIPE AT ELEV. 572.7 JUNE 26, 1973

15 ◆ 5 (0, 10) Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.

Golder Associates

DRAWN KD

CHECKED BRG

Form G.A. - D - 1

Project No. 73572

RECORD OF BOREHOLE 9

LOCATION See Figure 4 BORING DATE JUNE 5 & 11, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD: POWER AUGER 4.5" DIA. (UNCASED)

ELEV'N. DEPTH	DESCRIPTION	SAMPLE NUMBER	TYPE	BLOWS/FT.	ELEVATION SCALE	WATER CONTENT / SHEAR STRENGTH	PIEZOMETER OR STANDPIPE INSTALLATION
					580		ROAD SURFACE
576.8	ROAD SURFACE						
0.0	ASPHALT						
0.4	CONCRETE						
1.0	BASE SLAB					BROWN SAND & GRAVEL (BASECOURSE)	
1.2	STIFF BROWN & GREY MOTTLED SILTY CLAY SOME SAND, TR. GRAVEL	1	2" DO.	10	575		CLAY BACKFILL
		2	"	8			
572.8 4.0	VERY STIFF BROWN SILTY CLAY SOME SAND, TR. GRAVEL (TILL-LIKE)					>2400	JUNE 26/73
		3	"	16	570		PLASTIC TUBING
		4	"	20	565		
564.1 12.7	STIFF BECOMING FIRM GREY SILTY CLAY SOME SAND TR. GRAVEL (TILL-LIKE)	5	"	13			
		6	"	8	560		GRANULAR MATERIAL
		7	"	8			PERFORATED STANDPIPE
554.8 22.0	END OF HOLE				555		BOREHOLE DRY DURING DRILLING

WATER LEVEL IN STANDPIPE AT ELEV. 571.8 JUNE 26, 1973

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + Q. - ● REM. V. - ⊕ U. - O 500 1000 1500 2000

COEFFICIENT OF PERMEABILITY, K., CM./SEC. 1x10 1x10 1x10 1x10

WATER CONTENT, PERCENT Wp W WL 10 20 30 40

ADDITIONAL LAB. TESTING

15 0 5 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.

Golder Associates

DRAWN AMD

CHECKED BRG

Form G.A. - D - I

Project No. 73572

RECORD OF BOREHOLE 10

LOCATION See Figure 4 BORING DATE JUNE 5 & 11, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD: POWER AUGER 4.5" DIA. (UNCASED)

ELEV'N. DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS/FT.
576.4	ROAD SURFACE			
0.0	ASPHALT			
0.4	CONCRETE BASE SLAB			
0.8	STIFF TO FIRM BROWN & GREY MOTTLED SILTY CLAY SOME SAND, TR. GRAVEL	1	2" DO.	11
		2	"	10
		3	"	4
571.1 5.3	HARD BROWN SILTY CLAY SOME SAND, TR. GRAVEL (TILL-LIKE)	4	"	35
567.4 9.0	VERY STIFF BECOMING STIFF GREY SILTY CLAY SOME SAND, TR. GRAVEL (TILL-LIKE)	5	"	16
		6	"	11
		7	"	9
		8	"	9
554.4 22.0	END OF HOLE			

ELEVATION SCALE: 580, 575, 570, 565, 560, 555

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT.: 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT.: NAT. V. - + REM.V. - ● Q.-● U.-O : 500 1000 1500 2000

COEFFICIENT OF PERMEABILITY, K., CM./SEC.: 1x10 1x10 1x10 1x10

WATER CONTENT, PERCENT W_P W W_L: 10 20 30 40

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION:

- ROAD SURFACE
- CLAY BACKFILL
- JUNE 26/73
- PLASTIC TUBING
- GRANULAR MATERIAL
- PERFORATED STANDPIPE
- BOREHOLE DRY DURING DRILLING
- WATER LEVEL IN STANDPIPE AT ELEV. 571.9 JUNE 26, 1973

0 / 15 / 5 / 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.

Golder Associates

DRAWN KP

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Project No. 73572

RECORD OF BOREHOLE 11

LOCATION See Figure 5 BORING DATE JUNE 5 & 8, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD: POWER AUGER 4.5" DIA. (UNCASED)

ELEV'N. / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS/FT.	WATER CONTENT	ADDITIONAL LAB. TESTING
577.3 / 0.0	ROAD SURFACE ASPHALT					
0.3	CONCRETE BASE SLAB					
576.3 / 1.0						
1.3	STIFF BLACK TO DARK BROWN SILTY CLAY & ORGANIC MATTER (FILL)	1	2" DO	14	⊙	
		2	"	6	⊙	
573.3 / 4.0		3	"	14	⊙	
570.8 / 6.5	VERY STIFF BROWN SILTY CLAY SOME SAND, TR. GRAVEL (TILL-LIKE)	4	"	20	⊙	
		5	"	19	⊙	
564.6 / 12.7	STIFF GREY SILTY CLAY SOME SAND TR. GRAVEL (TILL-LIKE)	6	"	15	⊙	
		7	"	9	⊙	MH
		8	"	8	⊙	
555.3 / 22.0	END OF HOLE					

ELEVATION SCALE: 580, 575, 570, 565, 560, 555

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + Q.-● REM.V.- ● U.-O

COEFFICIENT OF PERMEABILITY, K., CM./SEC. Ix10 Ix10 Ix10 Ix10

WATER CONTENT, PERCENT Wp W WL 10 20 30 40

BROWN SAND & GRAVEL (BASECOURSE)

STIFF BECOMING VERY STIFF BROWN & GREY MOTTLED SILTY CLAY SOME SAND TR. GRAVEL

ATTEMPTED VANE TEST AT ELEV. 555.8 MATERIAL TOO STIFF FOR TEST

PIEZOMETER OR STANDPIPE INSTALLATION:

ROAD SURFACE

CLAY BACKFILL

JUNE 26/73

PLASTIC TUBING

GRANULAR MATERIAL

PERFORATED STANDPIPE

BOREHOLE DRY DURING DRILLING

WATER LEVEL IN STANDPIPE AT ELEV. 570.8 JUNE 26, 1973

15 0 5 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.

Golder Associates

DRAWN [illegible]

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Project No. 73572

RECORD OF BOREHOLE 12

LOCATION See Figure 5 BORING DATE JUNE 5 & 11, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD: POWER AUGER 4.5" DIA. (UNCASED)

ELEV'N. / DEPTH	SOIL PROFILE DESCRIPTION	SAMPLE NUMBER	TYPE	BLOWS/FT.
577.2	ROAD SURFACE			
0.0	ASPHALT			
576.2 / 1.0	BROWN SAND & GRAVEL (BASECOURSE)			
1.5	STIFF BLACK TO DARK BROWN SILTY CLAY & ORGANIC MATTER (FILL)	1	2" DO	10
574.7 / 2.5		2	"	11
		3	"	10
	STIFF BECOMING VERY STIFF BROWN SILTY CLAY SOME SAND TR. GRAVEL (TILL-LIKE)	4	"	16
		5	"	18
		6	"	22
		7	"	18
559.0 / 18.2	STIFF GREY SILTY CLAY SOME SAND TR. GRAVEL (TILL-LIKE)	8	"	10
556.7 / 20.5	END OF HOLE			

ELEVATION SCALE: 580, 575, 570, 565, 560, 555

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + REM. V. - ⊕ Q. - ● U. - O

COEFFICIENT OF PERMEABILITY, K., CM./SEC. 1x10 1x10 1x10 1x10

WATER CONTENT, PERCENT Wp W Wl 10 20 30 40

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION:

- ROAD SURFACE
- CLAY BACKFILL
- JUNE 26/73
- PLASTIC TUBING
- GRANULAR MATERIAL
- PERFORATED STANDPIPE

BOREHOLE DRY DURING DRILLING

WATER LEVEL IN STANDPIPE AT ELEV. 573.2 JUNE 26, 1973

15 0 5 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.

Golder Associates

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Project No. 73572

RECORD OF BOREHOLE 13

LOCATION See Figure 5 BORING DATE JUNE 5 & 8, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD	ELEV'N. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FT.	ELEVATION SCALE	DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. 20 40 60 80 / SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + Q. - ● REM.V. - ⊕ U. - O	COEFFICIENT OF PERMEABILITY, K., CM./SEC. 1x10 1x10 1x10 1x10 / WATER CONTENT, PERCENT Wp W WL 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
							580				ROAD SURFACE
POWER AUGER 4.5" DIA. (UNCASED)	576.5	ROAD SURFACE									
	0.0	ASPHALT									
	0.4							CONCRETE BASE SLAB			CLAY BACKFILL
	0.9										
	1.3	STIFF BROWN & GREY MOTTLED SILTY CLAY SOME SAND, TR. GRAVEL		1	2" D.O.	10	575	BROWN SAND & GRAVEL (BASECOURSE)	⊙		
				2	"	11			⊙		
				3	"	13			⊙		PLASTIC TUBING
	571.0 5.5	HARD BECOMING VERY STIFF BROWN SILTY CLAY SOME SAND TR. GRAVEL (TILL-LIKE)		4	"	31	570		⊙		
				5	"	24	565		⊙		
	563.7 12.8	STIFF GREY SILTY CLAY SOME SAND, TR. GRAVEL (TILL-LIKE)		6	"	15			⊙		JUNE 26/73
				7	"	9	560		⊙		GRANULAR MATERIAL
				8	"	9			⊙		PERFORATED STANDPIPE
	554.5 22.0	END OF HOLE					555	ATTEMPTED VANE TEST AT ELEV. 555.0 MATERIAL TOO STIFF FOR TEST			BOREHOLE DRY DURING DRILLING
							550				WATER LEVEL IN STANDPIPE AT ELEV. 561.0 JUNE 26, 1973

15 0 5 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 4 FT.

Golder Associates

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Project No. 73572

RECORD OF BOREHOLE 14

LOCATION See Figure   BORING DATE JUNE 5, 1973   DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN.   PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD	ELEV'N. / DEPTH	DESCRIPTION	SAMPLE NUMBER	TYPE	BLOWS/FT.	ELEVATION SCALE	WATER CONTENT (approx. %)	PIEZOMETER OR STANDPIPE INSTALLATION
POWER AUGER 4.5" DIA (UNCASED)						577		
	576.5 / 0.0	ROAD SURFACE						
		ASPHALT						
	576.0 / 0.5	CONCRETE BASE SLAB				576		
	575.2 / 1.3	BROWN SAND & GRAVEL (BASECOURSE)						
	1.4	STIFF BLACK TO DARK BROWN SILTY, CLAY & ORGANIC MATTER (FILL)				575		
			1	2" D.O.	9		⊙	
	573.7 / 2.8	STIFF BROWN & GREY MOTTLED SILTY CLAY SOME SAND, TR. GRAVEL				574		
			2	"	11	573	⊙	
	572.2 / 4.3	VERY STIFF BROWN SILTY CLAY SOME SAND, TR. GRAVEL (TILL-LIKE)				572		
			3	"	13		⊙	
						571		
			4	"	26	570	⊙	BOREHOLE DRY DURING DRILLING
	569.2 / 7.3	END OF HOLE				569		

Column headings: SOIL PROFILE; SAMPLES; STRAT. PLOT; DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. 20 40 60 80; SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + Q. - ● REM. V. - ● U. - O; COEFFICIENT OF PERMEABILITY, K., CM./SEC. 1x10 1x10 1x10 1x10; WATER CONTENT, PERCENT W_p W W_L 10 20 30 40; ADDITIONAL LAB. TESTING

15 0 5 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 1 FT.

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Project No. 73666

RECORD OF BOREHOLE 1

LOCATION See Figure 1 BORING DATE DECEMBER 11, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD: POWER AUGER 4.5" DIA. (UNCASED)

ELEV'N. DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS/FT.	ADDITIONAL LAB. TESTING
576.7	ROAD SURFACE (ASPHALT)				
0.2	CONCRETE SLAB				
0.8	BLACK SILTY CLAY (TOPSOIL)	1	2" D.O.	15	
574.3 2.4	STIFF TO FIRM BROWN SILTY CLAY TRACE SAND AND GRAVEL (FILL)	2	"	10	
		3	"	8	
		4	"	6	MH
568.9 7.8	VERY STIFF BROWN SILTY CLAY, SOME SAND, TR. GRAVEL (TILL-LIKE)	5	"	22	
565.2 11.5	VERY STIFF GREY SILTY CLAY, SOME SAND, TRACE GRAVEL (TILL-LIKE)	6	"	16	
		7	"	8	
		8	"	7	
		9	"	10	
550.7 26.0	END OF HOLE				

ELEVATION SCALE: 580, 575, 570, 565, 560, 555, 550

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT. 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + Q. - ● REM.V. - ⊕ U. - O
500 1000 1500 2000

COEFFICIENT OF PERMEABILITY, K., CM./SEC. 1x10 1x10 1x10 1x10

WATER CONTENT, PERCENT Wp W WL
10 20 30 40

Percent axial strain at failure (0, 5, 10, 15)

PIEZOMETER OR STANDPIPE INSTALLATION:
ROAD SURFACE
PROTECTIVE PIPE & CAP
GROUT SEAL
CLAY BACKFILL
PLASTIC TUBING
DEC. 21/73
GRANULAR MATERIAL
PERFORATED STANDPIPE

BOREHOLE DRY DURING DRILLING

WATER LEVEL IN STANDPIPE AT ELEV. 559.2 DEC. 21, 1973

VERTICAL SCALE 1 IN. TO 5 FT.

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Project No. 73666

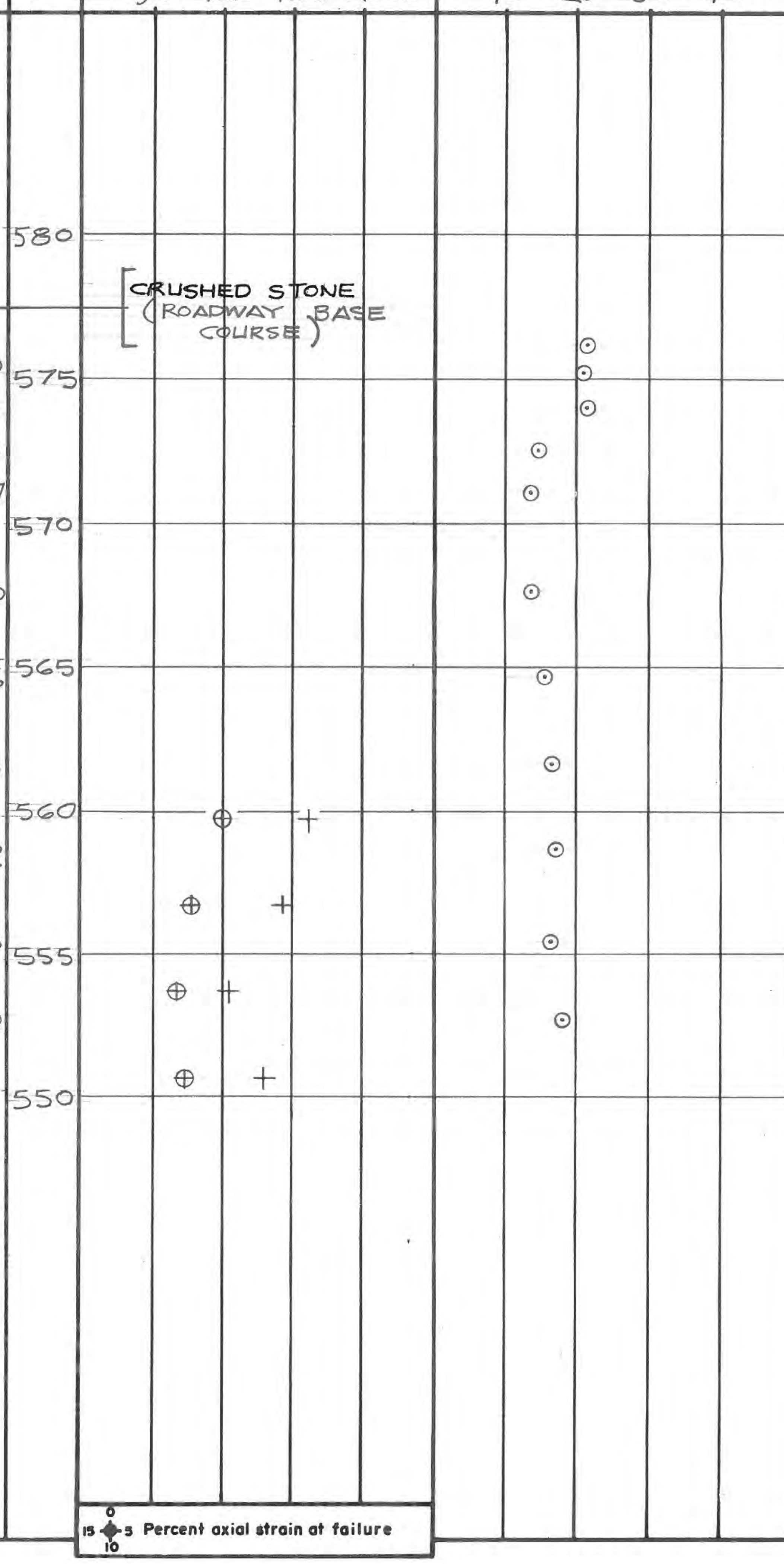
RECORD OF BOREHOLE 2

LOCATION See Figure 1 BORING DATE DECEMBER 11, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

Boring method: POWER AUGER 4.5" DIA. (UNCASED)

ELEV'N. DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS/FT.
	ASPHALT			
577.1	ROAD SURFACE			
0.1 576.3 0.8	CONCRETE SLAB			
1.2	BLACK SILTY CLAY (TOPSOIL)	1A 1B	2" D.O.	10
574.6 2.5	STIFF BROWN SILTY CLAY, TRACE SAND, AND GRAVEL (FILL)	2	"	8
		3	"	10
571.6 5.5	VERY STIFF TO HARD BROWN SILTY CLAY, SOME SAND, TRACE GRAVEL (TILL-LIKE)	4	"	27
		5	"	30
565.3 11.8	VERY STIFF GREY SILTY CLAY, SOME SAND, TRACE GRAVEL (TILL-LIKE)	6	"	26
		7	"	10
		8	"	12
		9	"	10
		10	"	10
550.1 27.0	END OF HOLE			



ADDITIONAL LAB. TESTING: MH

PIEZOMETER OR STANDPIPE INSTALLATION:

ROAD SURFACE

PROTECTIVE PIPE & CAP

GROUT SEAL

CLAY BACKFILL

PLASTIC TUBING

GRANULAR MATERIAL

DEC. 21/73

PERFORATED STANDPIPE

BOREHOLE DRY DURING DRILLING

WATER LEVEL IN STANDPIPE AT ELEV. 555.4 DEC. 21, 1973

VERTICAL SCALE 1 IN. TO 5 FT.

Golder Associates

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Project No. 73666

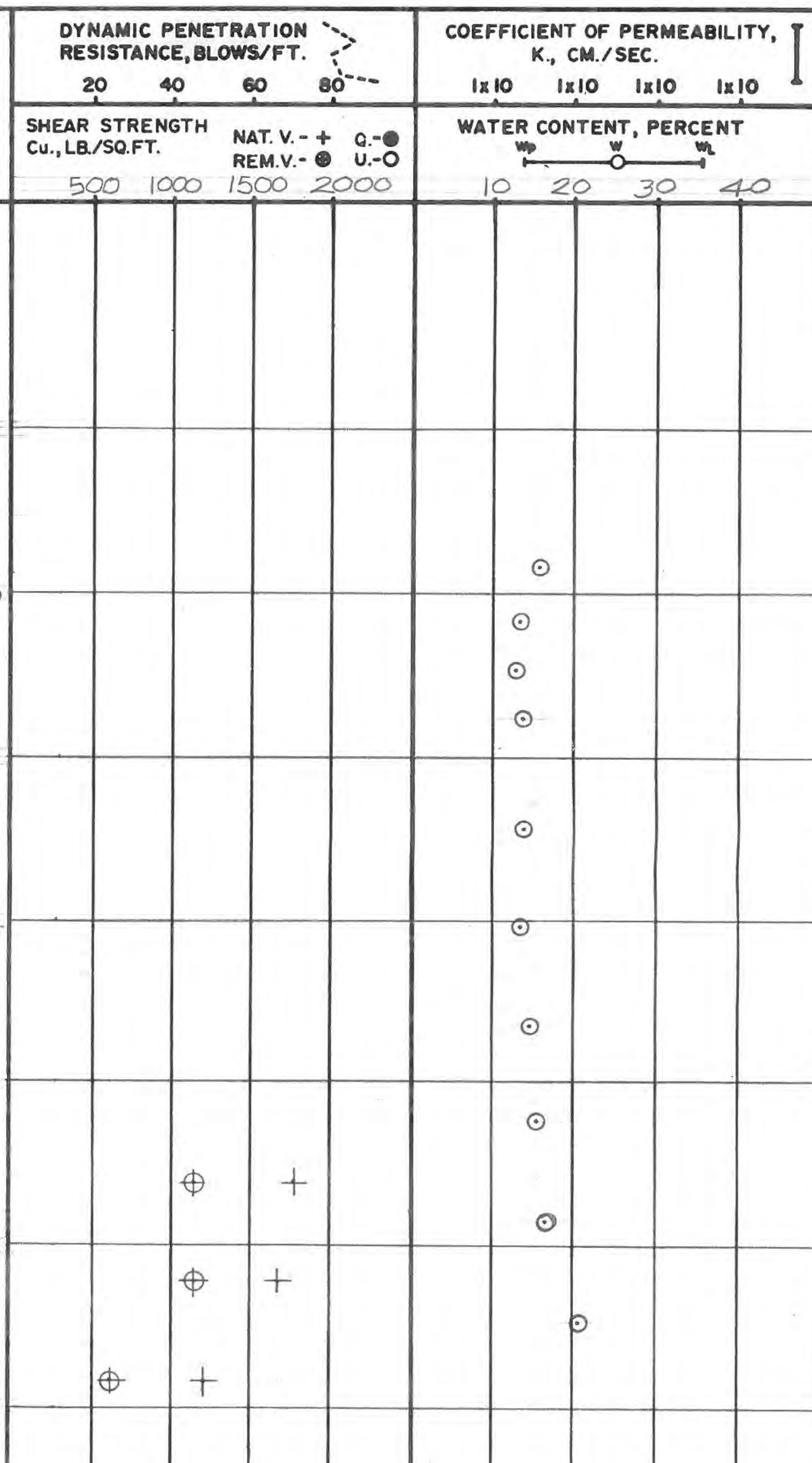
RECORD OF BOREHOLE 3

LOCATION See Figure 1 BORING DATE DECEMBER 12, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD	ELEV'N. DEPTH	SOIL PROFILE DESCRIPTION	SAMPLE NUMBER	TYPE	BLOWS/FT.	ELEVATION SCALE	PIEZOMETER OR STANDPIPE INSTALLATION
		ASPHALT				580	ROAD SURFACE; PROTECTIVE PIPE & CAP
POWER AUGER 4.5" DIA. (UNCASED)	577.4	ROAD SURFACE					
	576.6 0.1	CONCRETE SLAB					GROUT SEAL
	0.8	STIFF BROWN & GREY SILTY CLAY, POCKETS OF ORGANIC MATERIAL (FILL)	1	2" D.O.	12		
	574.9 2.5	HARD BROWN SILTY CLAY, SOME SAND, TRACE GRAVEL (TILL-LIKE)	2	"	32	575	CLAY BACKFILL
			3	"	40		
			4	"	43		
						570	PLASTIC TUBING
			5	"	45		
	565.6 11.8	VERY STIFF TO STIFF GREY SILTY CLAY, SOME SAND, TRACE GRAVEL (TILL-LIKE)	6	"	26	565	
			7	"	20		GRANULAR MATERIAL
						560	PERFORATED STANDPIPE
			8	"	14		DEC. 21/73
			9	"	12	555	CLAY BACKFILL
			10	"	8		
	550.4 27.0	END OF HOLE				550	BOREHOLE DRY DURING DRILLING

WATER LEVEL IN STANDPIPE AT ELEV. 558.5 DEC. 21, 1973



15 5 Percent axial strain at failure 0 10

VERTICAL SCALE 1 IN. TO 5 FT.

Golder Associates

DRAWN AVD

CHECKED HWC

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Project No. 73666

RECORD OF BOREHOLE 4

LOCATION See Figure 1 BORING DATE DECEMBER 11, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD: POWER AUGER 4.5" DIA. (UNCASED)

ELEV'N. / DEPTH	SOIL PROFILE DESCRIPTION
	FIRM BROWN SILTY CLAY AND ORGANIC MATERIAL (FILL)
577.9	GROUND SURFACE
0.0	
576.6 / 1.3	COMPACT BROWN SAND, TRACE TO SOME SILT AND GRAVEL
574.7 / 3.2	FIRM BLUISH-GREY SILTY CLAY (ALLUVIUM)
572.9 / 5.0	COMPACT GREY SAND & GRAVEL
570.9 / 7.0	HARD BROWN SILTY CLAY, SOME SAND, TRACE GRAVEL (TILL-LIKE)
560.6 / 17.3	VERY STIFF TO STIFF GREY SILTY CLAY SOME SAND, TRACE GRAVEL (TILL-LIKE)
550.9 / 27.0	END OF HOLE

SAMPLE NUMBER	TYPE	BLOWS/FT.	ADDITIONAL LAB. TESTING
1	2" D.O.	7	
2	"	11	MH
3	"	5	
4	"	7	M
5	"	27	
6	"	58	
7	"	68	
8	"	42	
9	"	38	
10	"	39/8"	MH
11	"	12	
12	"	5	

ELEVATION SCALE: 580, 575, 570, 565, 560, 555, 550

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT.: 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT. NAT. V. - + Q. - ● REM.V. - ⊕ U. - O: 500 1000 1500 2000

>2400+

COEFFICIENT OF PERMEABILITY, K., CM./SEC.: 1x10 1x10 1x10 1x10

WATER CONTENT, PERCENT (W_P, W, W_L): 10 20 30 40

PIEZOMETER OR STANDPIPE INSTALLATION: GROUND SURFACE; CLAY BACKFILL; DEC. 11/73; DEC. 21/73; PLASTIC TUBING; GRANULAR MATERIAL; PERFORATED STANDPIPE

WATER LEVEL IN STANDPIPE AT ELEV. 574.9 DEC. 11, 1973

WATER LEVEL IN STANDPIPE AT ELEV. 574.9 DEC. 21, 1973

0 / 15 / 5 / 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 5 FT.

Golder Associates

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Project No. 73666

RECORD OF BOREHOLE 5

LOCATION See Figure 1 BORING DATE DECEMBER 12, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD: POWER AUGER 4.5" DIA. (UNCASED)

ELEV'N. DEPTH	SOIL PROFILE DESCRIPTION	SAMPLE NUMBER	TYPE	BLOWS/FT.
	BLACK SILTY CLAY (TOPSOIL)			
578.5	GROUND SURFACE			
0.0 577.5 1.0	STIFF BROWN & GREY SILTY CLAY, POCKETS OF ORGANIC MATERIAL (FILL)	1	2" D.O.	11
		2	"	10
		3	AS	—
573.7 4.8	STIFF TO FIRM BLUISH-GREY SILTY CLAY (ALLUVIUM)	4	2" D.O.	15
		5	"	7
570.7 7.8	VERY STIFF TO HARD BROWN SILTY CLAY, SOME SAND, TRACE GRAVEL (TILL-LIKE)	6	"	28
		7	"	55
564.5 14.0	VERY STIFF TO STIFF GREY SILTY CLAY, SOME SAND, TRACE GRAVEL (TILL-LIKE)	8	"	22
		9	"	9
		10	"	7
553.5 25.0	COMPACT GREY FINE SAND	11A/B	"	20
25.5	END OF HOLE			

ELEVATION SCALE: 580, 575, 570, 565, 560, 555, 550

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT.: 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT.: 500 1000 1500 2000 — NAT. V. - + Q. - ● REM. V. - ● U. - O

COEFFICIENT OF PERMEABILITY, K., CM./SEC.: 1x10 1x10 1x10 1x10

WATER CONTENT, PERCENT: Wp W WL — 10 20 30 40

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION:

GROUND SURFACE

CLAY BACKFILL

DEC. 21/73

PLASTIC TUBING

GRANULAR MATERIAL

PERFORATED STANDPIPE

BOREHOLE DRY DURING DRILLING

WATER LEVEL IN STANDPIPE AT ELEV. 575.5 DEC. 21, 1973

15 5 / 0 / 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 5 FT.

Golder Associates

DRAWN A.V.D.

CHECKED HWC

Form G.A. - D - I

Project No. 73666

RECORD OF BOREHOLE 6

LOCATION See Figure 7 BORING DATE DECEMBER 13, 1973 DATUM GEODETIC

SAMPLER HAMMER WEIGHT 140 LB., DROP 30 IN. PENETRATION TEST HAMMER WEIGHT 140 LB., DROP 30 IN.

BORING METHOD	ELEV'N. / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS/FT.
	575.5	WATER SURFACE			
NX CASING	0.0	WATER			
	569.0 / 6.5 / 7.0	BLUISH-GREY SILTY CLAY SOME SAND AND GRAVEL (ALLUVIUM)	1 A / B	2" D.O.	24
		HARD BROWN SILTY CLAY, SOME SAND TR. GRAVEL (TILL-LIKE)	2	"	48
WASH BORING UNCASED			3	"	50
	564.5 / 11.0		4	"	28
		VERY STIFF TO STIFF GREY SILTY CLAY, SOME SAND, TRACE GRAVEL (TILL-LIKE)	5	"	22
			6	"	12
			7	"	11
			8	"	8
			9	"	13
			10	"	9
			11	"	7
	543.5 / 32.0	END OF HOLE			

STRAT. PLOT | ELEVATION SCALE: 580, 575, 570, 565, 560, 555, 550, 545, 540

DYNAMIC PENETRATION RESISTANCE, BLOWS/FT.: 20 40 60 80

SHEAR STRENGTH Cu., LB./SQ.FT.: NAT. V. - + Q. - ● REM. V. - ⊕ U. - O — 500 1000 1500 2000

COEFFICIENT OF PERMEABILITY, K., CM./SEC.: 1x10 1x10 1x10 1x10

WATER CONTENT, PERCENT: W_p W W_L — 10 20 30 40

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

15 0 5 10 Percent axial strain at failure

VERTICAL SCALE 1 IN. TO 5 FT.

Golder Associates

DRAWN SVP

CHECKED HWC

RECORD OF BOREHOLE BH-101

PROJECT: 13-1140-0026

SHEET 1 OF 1

LOCATION: REFER TO LOCATION PLAN

BORING DATE: March 13, 2013

DATUM: GEODETIC

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

PENETRATION TEST HAMMER, 63.5 kg; DROP, 760 mm

BORING METHOD: POWER AUGER, 83mm ID HOLLOW STEM

DESCRIPTION	ELEV. / DEPTH (m)
ROAD SURFACE	175.85 / 0.00
ASPHALT	0.10
CONCRETE	175.57 / 0.28
(CL) sandy **SILTY CLAY**, trace gravel; mottled brown and grey, **(TILL)**; cohesive, w~PL, stiff.	174.84 / 1.01
(CL) sandy **SILTY CLAY**, trace gravel; brown, **(TILL)**, cohesive, w~PL, very stiff to stiff.	171.74 / 4.11
(CL) sandy **SILTY CLAY**, trace gravel; grey, **(TILL)**; cohesive, w~PL, stiff to firm.	170.82 / 5.03
END OF BOREHOLE	

SAMPLE NUMBER	TYPE	BLOWS/0.3m
1	SS	8
2	SS	10
3	SS	18
4	SS	17
5	SS	13
6	SS	12
7	SS	5

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ — 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT: Wp —○W— Wl — 10 20 30 40

ELEVATION: 176, 175, 174, 173, 172, 171, 170

DEPTH SCALE METRES: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

ADDITIONAL LAB. TESTING

INSTALLATION AND GROUNDWATER OBSERVATIONS: Borehole dry upon completion of drilling on March 13, 2013.

DEPTH SCALE 1 : 50

Golder Associates

LOGGED: LS

CHECKED:

LDN_BHS_02 1311400026.GPJ 22/03/13 DATA INPUT: DMB

PROJECT: 13-1140-0026

RECORD OF BOREHOLE BH-102

SHEET 1 OF 1

LOCATION: REFER TO LOCATION PLAN

BORING DATE: March 13, 2013

DATUM: GEODETIC

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

PENETRATION TEST HAMMER, 63.5 kg; DROP, 760 mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
0		GROUND SURFACE		176.15								
		(CI) SILTY CLAY, some sand; black, **(TOPSOIL)**; moist.		0.00	1	CS		176				Borehole dry upon completion of drilling on March 13, 2013.
		(CL) sandy **SILTY CLAY**, some gravel; brown and grey, **(FILL)**; cohesive, w<PL.		175.87 0.33	2	CS						
		(CL) sandy **SILTY CLAY**, trace gravel; mottled brown and grey, organic pockets, **(TILL)**; cohesive, w>PL.		0.41	3	CS						
1		END OF BOREHOLE						175				
2												
3												
4												
5												
6												
7												
8												
9												

LDN_BHS_02 1311400026.GPJ 22/03/13 DATA INPUT: DMB

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: LS

CHECKED:

RECORD OF BOREHOLE BH-103

PROJECT: 13-1140-0026

SHEET 1 OF 1

LOCATION: REFER TO LOCATION PLAN

BORING DATE: March 13, 2013

DATUM: GEODETIC

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

PENETRATION TEST HAMMER, 63.5 kg; DROP, 760 mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	ELEV. / DEPTH (m)	SAMPLE NUMBER	TYPE	BLOWS/0.3m	ELEVATION	SHEAR STRENGTH Cu, kPa (nat V. + / rem V. ⊕)	WATER CONTENT PERCENT (W)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
0	POWER AUGER 83mm ID HOLLOW STEM	ROAD SURFACE	175.97				176				Borehole dry upon completion of drilling on March 13, 2013.
		ASPHALT	0.00								
		CONCRETE	0.06								
		(CL) sandy **SILTY CLAY**, trace gravel; mottled brown and grey, with organic pockets, **(TILL)**; cohesive, w>PL, firm to stiff.	0.22	1	SS	6			~19		
1				2	SS	8	175		~20		
		(CL) sandy **SILTY CLAY**, trace gravel; brown, **(TILL)**, cohesive, w~PL, very stiff to stiff.	174.60 / 1.37	3	SS	19			~14		
2				4	SS	14	174		~14		
3				5	SS	11	173		~15		
		(CL) sandy **SILTY CLAY**, trace gravel; grey, **(TILL)**; cohesive, w~PL, very stiff to firm.	172.31 / 3.66					>96 +			
4				6	SS	6	172		~15		
								⊕ ~30; + ~65			
				7	SS	3			~17		
5		END OF BOREHOLE	170.94 / 5.03				171				
6							170				
7											
8											
9											

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80
HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}
SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ — 20 40 60 80
WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl — 10 20 30 40

DEPTH SCALE 1 : 50

Golder Associates

LOGGED: LS

CHECKED:

PROJECT: 13-1140-0026

RECORD OF BOREHOLE BH-104

SHEET 1 OF 1

LOCATION: REFER TO LOCATION PLAN

BORING DATE: March 13, 2013

DATUM: GEODETIC

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

PENETRATION TEST HAMMER, 63.5 kg; DROP, 760 mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT Wp ⊢ ○W ⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
		GROUND SURFACE		176.28								
0		(CI) SILTY CLAY, some sand; black, **(TOPSOIL)**; moist.		0.00	1	CS						Borehole dry upon completion of drilling on March 13, 2013.
		(CL) sandy **SILTY CLAY**, trace gravel; mottled brown and grey, **(TILL)**; cohesive, w~PL.		176.03 0.25	2	CS		176				
		END OF BOREHOLE		0.33								
1								175				
2												
3												
4												
5												
6												
7												
8												
9												

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: LS

CHECKED:

RECORD OF BOREHOLE BH-105

PROJECT: 13-1140-0026

SHEET 1 OF 1

LOCATION: REFER TO LOCATION PLAN

BORING DATE: March 13, 2013

DATUM: GEODETIC

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

PENETRATION TEST HAMMER, 63.5 kg; DROP, 760 mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	ELEV. / DEPTH (m)	SAMPLE NUMBER	TYPE	BLOWS/0.3m	INSTALLATION AND GROUNDWATER OBSERVATIONS
0	POWER AUGER, 83mm ID HOLLOW STEM	ROAD SURFACE	176.21				
		ASPHALT	0.00				Borehole dry upon completion of drilling on March 13, 2013.
		CONCRETE	0.10				
		(CL) sandy **SILTY CLAY**, trace gravel; mottled brown and grey, layers/pockets of topsoil, **(TILL)**; cohesive, w>PL, stiff to firm.	0.25	1	SS	8	
1				2	SS	6	
		(CL) sandy **SILTY CLAY**, trace gravel; brown, **(TILL)**, cohesive, w~PL, stiff to very stiff.	174.84 / 1.37	3	SS	12	
2				4	SS	15	
3		(CL) sandy **SILTY CLAY**, trace gravel; grey, **(TILL)**; cohesive, w~PL, very stiff to firm.	172.86 / 3.35	5	SS	9	
4				6	SS	5	
				7	SS	4	
5		END OF BOREHOLE	171.18 / 5.03				

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ● ; rem V. ⊕ U - ○ : 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT: Wp ⊢ ○W ⊣ Wl : 10 20 30 40

ELEVATION: 176, 175, 174, 173, 172, 171

ADDITIONAL LAB. TESTING

>96

DEPTH SCALE 6 7 8 9

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: LS

CHECKED:

LDN_BHS_02 1311400026.GPJ 22/03/13 DATA INPUT: DMB

RECORD OF BOREHOLE BH-103

PROJECT: 1899798

SHEET 1 OF 1

LOCATION: REFER TO LOCATION PLAN

BORING DATE: May 28, 2018

DRILLING CONTRACTOR: Henderson Drilling Inc.

DATUM: LOCAL

HAMMER TYPE: Auto Hammer

DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE: DESCRIPTION, STRATA PLOT, ELEV. DEPTH (m) | SAMPLES: NUMBER, TYPE, BLOWS/0.3m | ELEVATION | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20, 40, 60, 80); SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20, 40, 60, 80) | HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}); WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10, 20, 30, 40) | ADDITIONAL LAB. TESTING | INSTALLATION AND GROUNDWATER OBSERVATIONS

Boring method: POWER AUGER, 83mm ID HOLLOW STEM

Description	Elev. / Depth (m)
ASPHALT SURFACE	99.81
ASPHALTIC CONCRETE	0.07
FILL, gravelly sand, some silt; grey, angular	0.23
TOPSOIL, sandy silty clay; black	99.40 / 0.41
(CI) sandy **SILTY CLAY**, trace gravel, with oxidized fissures; brown, **TILL**; stiff to very stiff	96.31 / 3.50
END OF BOREHOLE	

Number	Type	Blows/0.3m
1	SS	9
2	SS	17
3	SS	20
4	SS	19

Elevation: 100, 99, 98, 97

Depth scale: 0, 1, 2, 3

Borehole dry during drilling on May 28, 2018

RECORD OF BOREHOLE BH-104

PROJECT: 1899798

LOCATION: REFER TO LOCATION PLAN

BORING DATE: May 28, 2018

DRILLING CONTRACTOR: Henderson Drilling Inc.

DATUM: LOCAL

HAMMER TYPE: Auto Hammer

DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE: DESCRIPTION, STRATA PLOT, ELEV. DEPTH (m) | SAMPLES: NUMBER, TYPE, BLOWS/0.3m | ELEVATION | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20, 40, 60, 80); SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20, 40, 60, 80) | HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}); WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10, 20, 30, 40) | ADDITIONAL LAB. TESTING | INSTALLATION AND GROUNDWATER OBSERVATIONS

Boring method: POWER AUGER, 83mm ID HOLLOW STEM

Description	Elev. / Depth (m)
ASPHALT SURFACE	99.83
ASPHALTIC CONCRETE	0.07
FILL, gravelly sand, some silt; grey, angular	0.23
(CI) sandy **SILTY CLAY**, trace gravel; mottled brown and grey, **TILL**; firm to stiff	96.93 / 2.90
(CI) sandy **SILTY CLAY**, trace gravel, with oxidized fissures; brown, **TILL**; very stiff	96.33 / 3.50
END OF BOREHOLE	

Number	Type	Blows/0.3m
1	SS	5
2	SS	6
3	SS	9
4	SS	17

Elevation: 100, 99, 98, 97

Depth scale: 0, 1, 2, 3

Borehole dry during drilling on May 28, 2018

DEPTH SCALE

1 : 50

GOLDER

LOGGED: SM

CHECKED: SM

GOLDER
MEMBER OF WSP

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APPENDIX D

Preliminary Soil Characterization Report

TECHNICAL MEMORANDUM

DATE November 3, 2021 **Project No.** 21482896-M01-Rev0

TO Mr. Jian Li, Ph.D., P.Eng., PE
Stantec Consulting Ltd.

FROM Carl Schroeder, M.A.Sc., P.Eng. **EMAIL** cschroeder@golder.com

PRELIMINARY ENVIRONMENTAL SOIL CHARACTERIZATION REPORT FOR ST. ROSE PUMP STATION CLASS ENVIRONMENTAL ASSESSMENT WINDSOR, ONTARIO

1.0 INTRODUCTION

This technical memorandum provides the results of the preliminary environmental soil quality characterization that was carried out in conjunction with the recent geotechnical assessment and preliminary geotechnical exploration and testing program by Golder Associates Ltd., a Member of WSP ("Golder") for the proposed St. Rose pump station Class Environmental Assessment (EA) (referred here as "the Project").

Stantec Consulting Ltd. ("Stantec" or "the Client") retained Golder to provide geo-environmental services in support of the preliminary design of an approximately 11-metre-deep pump station with a storm sewer outlet to the Detroit River located at St. Rose Avenue and Riverside Drive East in the City of Windsor, Ontario (referred to hereinafter as "the Site" or "Project Area"). As outlined in our July 28, 2021 proposal (Proposal Reference No. CX21482896), the purpose of the environmental sampling was to provide a preliminary assessment of on-site soil quality (i.e., of the soils which may require management during construction).

2.0 BACKGROUND AND OBJECTIVES

2.1 Regulatory Overview

On December 4, 2019, the Ministry of the Environment, Conservation and Parks (MECP) released Ontario Regulation (O.Reg.) 406/19, *On-Site and Excess Soil Management* (the "Regulation") which imposes new requirements on both generators and receivers of Excess Soil, outlines a defined process for assessing excess soil, and provides new standards for the assessment of excess soil quality. Under the regulation, all Excess Soil materials (removed from the Project Area) is considered a "waste" unless certain conditions are met.

The implementation dates for various sections of O.Reg. 406/19 are staggered through 2026; the first provisions (including the excess soil quality standards) came into effect on January 1, 2021. The regulatory sampling requirements (frequency and analytical parameters), and reporting requirements, for a given Project will depend on a number of factors, including the type of Project, the final volume of soil requiring off-site management and specific requirements of the intended receiver of the soil (i.e., of the "Re-Use Site").

The Regulation creates new responsibilities for the source site generator (Project Leader) of the Excess Soil to ensure it meets the applicable standards. Owners, planners and engineers involved in construction should

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develop plans for compliance with O.Reg. 406/19. The identification, characterization, and planning for the reuse of Excess Soil will need to occur/have occurred much earlier in the development timeline and prior to movement of soil off-site (i.e., outside of the Project Area). Going forward, all Excess Soil should be managed with the support of a Qualified Person (QP), as defined in O.Reg. 153/04, in accordance with best management practices[1] and municipal bylaws applying to the Reuse Site.

Additional regulatory requirements come into effect as of January 1, 2022, most notably a requirement for many Projects to file a notice on the public Registry (designed by O.Reg. 406/19) for Excess Soil. Although numerous cases exist for exemptions to filing a notice on the Registry (including for infrastructure projects), these will need to be evaluated on a case-by-case basis. For those projects where notification is required, the mandatory planning requirements of O.Reg. 406/19 (i.e., site assessment reporting, sampling and analysis, and reporting on re-use site characteristics, all to be prepared by a QP) also come into effect, along with the formal tracking requirements. Additionally, notifications include filing on a public Registry (designed by O.Reg. 406/19) for Excess Soil projects and selected larger Reuse Sites, unless specifically exempted from this requirement.

Although one or more of the “exemptions” (regarding notification on the Registry and/or preparation of the planning documents) may apply, it is advisable to assess excess soil quality at Project Areas (i.e., source sites) in general accordance with the sampling and analysis requirements of O.Reg. 406/19, particularly for larger construction projects that may be active in 2021 or 2022, to the extent that this is commercially acceptable or is driven by the Reuse Site requirements. This may relate to the preparation of planning documents (whether or not notification on the Registry is mandated by the Regulation) or sample frequency (or analytical parameters). **It is important to note that the Reuse Site’s specifications for the Excess Soil may be more stringent than the minimum regulatory requirements (of O.Reg. 406/19).**

2.2 Understanding of Client Objectives

Excess Soils generated during the Project (and removed from the Project Area) will need to be managed in accordance with O. Reg. 406/19. However, a defined anticipated volume of Excess Soil that may be generated during the Project has not been provided. Further, specific re-use options for the soil have not yet been identified. The alternatives available for beneficial re-use are assessed based on the volume of soil to be removed from the Project Area, the chemical characteristics of the Excess Soil, the characteristics of the re-use site (receiver site) and any specific requirements (regulatory or otherwise) that the re-use site may have regarding the import of Excess Soil onto their property.

The soil characterization data summarized herein will assist the Project Leader to assess, on a preliminary basis, the potential management, reuse, and disposal requirements for excess soils generated during construction.

[1] Ontario Environment Industry Association, 2021: Best Practices for Qualified Persons for Consideration with O.Reg.406/19: Onsite and Excess Soil Management in Ontario – Version 2, dated January 11, 2021.

3.0 INVESTIGATION SCOPE OF WORK

Three boreholes, designated as boreholes BH-101, BH-102A and BH-102B and located as shown on Figure 1, were advanced on October 4, 2021 to depths of about 15.8 metres, 1.7 metres, and 12.8 metres below the existing ground surface, respectively. The boreholes were advanced using a truck-mounted drill rig supplied and operated by a specialist drilling contractor, licensed by the MECP, under the supervision of a qualified member of our engineering staff.

The purpose of the work was to carry out a preliminary geotechnical exploration and testing program in order to supplement available geotechnical data compiled for a geotechnical assessment of the Site, as well as to identify the chemical composition of representative soil samples from within the Project Area to guide Excess Soil management alternatives. Details of Golder's geotechnical assessment and preliminary geotechnical exploration and testing program are provided under separate cover.

Borehole BH-102A met refusal when the power augering equipment encountered an obstruction at a depth of about 1.7 metres below ground surface and, subsequently, a new borehole (BH-102B) location was established about 1 metre south of BH-102A. In BH-102B, soil sampling and logging was carried out starting from about 1.5 metres below ground surface and extending to the depth of borehole termination at about 12.8 metres below ground surface. As indicated on the Record of Borehole sheet for BH-102B, the soil stratigraphy in the upper 1.5 metres of the borehole was inferred from the stratigraphy encountered in BH-102A.

In general, the subsurface soil conditions encountered in the boreholes consisted of surficial topsoil (about 100-to- 150-millimetres in thickness) underlain by a layer of sandy silty clay fill with organics, sand pockets and cobbles. BH-102A was terminated in the sandy silty clay fill after exploring the layer for about 1.5 metres and encountering an obstruction. In BH-101, the sandy silty clay fill was about 2.0 metres thick. In BH-102B, the sandy silty clay fill was about 2.4 metres thick and was underlain by a thin (approximately 0.3-metre-thick) layer of granular fill. Beneath the sandy silty clay fill or granular fill, both boreholes (BH-101 and BH-102B) encountered and were terminated in extensive fine-grained cohesive deposits of native sandy silty clay to clayey silt.

3.1 Sampling and Analysis Plan

With the first portion of the O.Reg. 406/19 now in effect, starting January 1, 2021, including the incorporation of the excess soil quality standards (ESQS)[2], it is current standard practice to compare results to the ESQS for the purposes of determining acceptable Reuse Sites. The ESQS are generally more stringent than the current corresponding O.Reg.153/04 site condition standards, with the exception of a few parameters. O.Reg. 406/19 also includes Leachate Screening Levels (LSLs) and Ceiling Values (CVs) for Excess Soil reuse, which are implemented to protect potential sensitive receptors at generic Reuse Sites.

To characterize the soils likely to become "Excess Soil", samples were selected by Golder from soils present from the surface down to a maximum depth of 11 metres below ground surface (inferred maximum depth of Project excavations). A cross section of sample depths was assessed through the soil sample collection program, with a focus on samples likely to have potentially higher concentrations of contaminants. Sampling was carried out

[2] MECP, 2020. Rules for Soil Management and Excess Soil Quality Standards. Adopted by reference in O.Reg.406/19 (On-Site and Excess Soil Management) made under the Environmental Protection Act, R.S.O. 1990, c. E.19 (EPA), updated December 8, 2020.

using 35-millimetre inside diameter, 610-millimetre long split-spoon samplers, to sample soil materials from the ground surface to the depth of borehole termination. Soil samples were collected in the split-spoons at selected intervals over the depth of each borehole. The split-spoons were decontaminated between each sampling run using detergent and water.

The samples were logged in the field for observations relating to petroleum hydrocarbon or other chemical impacts (e.g., odour, staining). Samples were placed in 1-litre sealable plastic bags for headspace vapour testing, which was completed using an RKI Eagle II detector, calibrated to a hexane standard (for combustible vapours) as well as an isobutylene standard (for organic vapours) and operated in the methane elimination mode. Measured headspace vapour concentrations were recorded as parts per million by volume. Soil samples were stored on ice prior to submission to the laboratory. Soil samples submitted for laboratory chemical analyses were placed in a cooler containing ice and delivered by courier under chain-of-custody procedures to Paracel Laboratories of Windsor, Ontario. Remaining soil samples not initially submitted for chemical analyses were stored at Golder's Windsor office and kept refrigerated, for possible subsequent laboratory submission.

No obvious field evidence of potentially significant chemical impact (i.e., staining or odour) was observed in the soil samples collected from the boreholes. The headspace (combustible and total organic) vapour concentrations for the soil samples collected from the boreholes are presented on the Record of Borehole sheets, attached. No significantly elevated headspace concentrations were measured in the samples collected (i.e., such as may be indicative of potentially significant chemical impacts to soil quality).

To provide a reasonable characterization of Excess Soil quality (with regard to the requirements of O.Reg. 406/19), and as proposed, a total of four samples from each of the boreholes, in addition to one duplicate soil sample, were submitted for laboratory analysis. Table A, attached, provides a summary of the soil samples submitted for analysis from each borehole. As noted on Table A, the following analyses were completed:

- Except as noted herein, and on Table A, each of the samples was submitted for analysis of O.Reg. 406/19 metals and metal hydrides, electrical conductivity (EC), sodium adsorption ratio (SAR), pH, petroleum hydrocarbons (PHC F1-F4 fractions), and benzene, toluene, ethylbenzene and xylene (BTEX), which comprise the minimum parameter list identified in O.Reg. 4016/19. [3] For due diligence purposes, the samples were also submitted for laboratory analysis of an expanded list of other regulated parameters (ORP, including free cyanide, available boron, hexavalent chromium and mercury),volatile organic compounds (VOCs) and semi-volatile organic compounds (sVOCs) (including polycyclic aromatic hydrocarbons, PAHs),. *As noted on Table A, two samples (BH-101-4 and BH-102B-2B) were not submitted for analysis of PHC F1 / BTEX or VOCs, as a result of container breakage.*

[3] These parameters comprise the minimum parameter list, as per the Soil Rules (MECP, 2020), for the characterization of Excess Soils when no specific contaminants of concern have been identified. Additional information review (such as completion of an Assessment of Past Uses) may identify additional contaminants of potential concern.

If applying the “minimum” sampling frequencies outlined in O. Reg. 406/19 to this project[4], the number of samples analyzed (i.e., 8, plus 1 duplicate) would support the off-Site removal of up to 1,600 cubic metres of Excess Soil, based on the understanding that these samples were collected from the areas where Excess Soil will be generated.

3.2 Environmental Criteria

To determine which excess soil quality standards (ESQS) (specifically, Table 1 and Tables 2.1 through 9.1 in *“Rules for Soil Management and Excess Soil Quality Standards”*) are applicable for assessing beneficial reuse, details of the source and receiving sites are required such as the source site soil chemistry, volume of source site soil that will report to a reuse location, the type of property use at the reuse location, the intended use at the reuse location and whether the groundwater usage is potable or non-potable at the reuse site, among other things.

To evaluate potential options and limitations regarding the potential beneficial re-use of the Excess Soil, the results of the sampling analysis were compared to the following ESQS (as referenced in Table A, attached):

- Table 1 ESQS (Full Depth Background Site Condition Standards) for agricultural or other property use (“Table 1 agricultural”) *[the most conservative ESQS];*
- Table 2.1 ESQS (Full Depth Excess Soil Quality Standards in a Potable Groundwater Condition) for agricultural or other property use (“Table 2.1 agricultural”) *[considered applicable for most agriculturally zoned properties];* and
- Table 3.1 ESQS (Full Depth Excess Soil Quality Standards in a Non-Potable Groundwater Condition) for industrial / commercial / community property use (“Table 3.1 ICC”) *[generally the least conservative ESQS].*

3.3 Analytical Results for Soil Samples

Table A, attached, includes a description of the soil samples collected for analysis along with a summary interpretation of the analytical results, as compared to the ESQS noted herein. Exceedances of the ESQS are summarized in Table A and detailed below. The laboratory certificate of analysis, with the analytical results compared to the Table 1 (agricultural) ESQS, is provided in Attachment A.

- As summarized in Table A, samples of **fill material** submitted for laboratory analysis contained salt-related parameters (EC and SAR), VOCs (xylenes and/or hexane), and/or multiple PAH parameters (sVOCs) **exceeding the Table 1 (agricultural) ESQS**.
- When the analytical results were compared to the **Table 2.1 (agricultural) ESQS**, only **one exceedance** was identified. **Total xylenes** were measured in a sample of **fill material** from BH-102B (2.3-2.6 mbgs) at a concentration exceeding the corresponding ESQS.

[4] For “in-situ” soil sampling, and for cases where a Sampling and Analysis Plan is required, O.Reg.406/19 requires a minimum of one sample for every 200 m^3 of excess soil for the first 10,000 m^3 of excess soil to be generated, one sample for every 450 m^3 from 10,001 m^3 to 40,000 m^3 of excess soil and one sample for every 2,000 m^3 after 40,001 m^3 of excess soil to be generated at the Project Area).

- With the exception of molybdenum, detected above the Table 1 ESQS in one soil sample (BH-101-4), **no exceedances** of either the Table 1 or Table 2.1 ESQS were identified for the soil samples deemed representative of the **native (silty clay) soils** encountered during the investigation.
- No exceedances of the Table 3.1 (ICC) ESQS were identified for the soil samples submitted for laboratory analysis.

4.0 SUMMARY

Based on the preliminary environmental sampling program, the following opinions and recommendations are provided in relation to the management of excess soil materials that may be generated during the proposed construction activities.

- **Suitability for Re-Use (Fill Materials):** Based on the available data, the beneficial re-use of the fill material (that would comprise a portion of the Excess Soil generated during construction) may be limited to a re-use site for industrial / commercial / community land use. It should be noted that the sandy silty clay fill materials are not suitable for reuse from a geotechnical perspective, as described in Golder's geotechnical assessment and preliminary geotechnical exploration report.
- **Suitability for Re-Use (Native Materials):** The concentration of molybdenum in the native sandy silty clay was greater than the corresponding Table 1 (agricultural) ESQS in sample BH-101-4; however, based on the measured concentration, their presence in native clayey soils (at depth), and a lack of mechanism for vertical contaminant distribution, the molybdenum concentration identified in the native soils were inferred to be naturally occurring. Furthermore, based on Golder's own experience working across southwestern Ontario, molybdenum is well known to occur in glacial silt and clay deposits at concentrations higher than the Table 1 (agricultural) ESQS.
  - Based on the environmental characteristics of the native soil materials that have been assessed, there are no restrictions regarding the *on-site reuse* of the native Excess Soils that will be generated at the Site during future construction activities;
  - With respect to the *off-site reuse* of the native Excess Soils from the Site, based on the available soil quality data, and in consideration of the criteria for molybdenum included with the ESQS, there may be some regulatory restrictions regarding its reuse, subject to the specific requirements (if any) that the receiving site(s) may have in place and subject to the results of any additional testing carried out.
- **Authorization for Re-Use:** For their records, due diligence and obligation under the Regulation, the Project Leader must obtain a written agreement specifically between the parties (the Project Leader and each individual Re-Use Site owner/operator) that provides appropriate (and clear) assurances that the Re-Use Site has been provided with satisfactory information and that they are in agreement with receiving the Excess Soil. The source site details, soil type, environmental and geotechnical quality, volume and intended beneficial re-use of the soil should be outlined in that agreement.

5.0 LIMITATIONS

This factual letter was prepared for the exclusive use by Stantec and the City of Windsor and is intended to provide a limited assessment of the quality of the Excess Soil materials specifically identified herein. Golder will not be responsible for any use of this letter by any other party or for the consequences thereof.

There is no warranty, express or implied, by Golder that this assessment has identified all potential sources of contaminants at the Project Area or that the Excess Soil (as characterized herein) is free from any and all contamination from past or current practices other than that noted, nor that all issues of environmental compliance have been addressed (including, but not necessarily limited to, the requirements of Ontario Regulation 406/19, as amended, that may apply to the Project). The environmental characterization of the Excess Soil materials located at the Project Area was based on the results of chemical analysis of samples collected on the date(s) and location(s) as described herein. No assurance is made regarding the quality of other Excess Soil material that may be generated at the Project Area (i.e., not reasonably represented by the material investigated and tested as part of this investigation).

The soil conditions in the area of investigation have been inferred based on conditions observed at a limited number of sampling locations in accessible areas; however, it should be noted that conditions between and beyond sampling locations may vary. In addition, the assessment is dependent upon the accuracy of the analytical data generated through sample analysis and is limited to determining the presence of contaminants for which analyses have been conducted.

In evaluating the environmental quality of the Excess Soil (as identified herein), Golder has relied in good faith on information provided by individuals and organizations noted in this letter. We assume that the information provided is factual and accurate. We accept no responsibility for any deficiency, misstatements or inaccuracies contained in this letter as a result of omissions, misinterpretations or fraudulent acts of the persons interviewed or contacted.

Where references have been made to regulatory guidelines and documents, it should be noted that regulatory statutes and guidelines are subject to interpretation and these guidelines and documents and their interpretation may be subject to change over time. Further, as indicated herein, a third-party re-use site may have other and additional requirements for site assessment, soil testing and documentation (and with consideration of broader regulatory requirements that may apply).

Golder accepts no responsibility for the consequential effects of this factual letter on the real or perceived costs associated with the development of the Project Site or the management of the Excess Soil generated during construction.

6.0 CLOSURE

We trust that this letter provides the necessary soil characterization information presently required. Should you at any point require clarification, or have any comments on this technical memorandum, please do not hesitate to contact this office.

Respectfully submitted,

GOLDER ASSOCIATES LTD.

Carl Schroeder, M.A.Sc., P.Eng.
Senior Environmental Engineer, QPESA

MH/CS/MAS/cr/ms

Attachments: Table A – Summary of Soil Samples Collected and Results of Laboratory Analysis
Method of Soil Classification
Abbreviations and Terms Used on Records of Boreholes and Test Pits
List of Symbols
Record of Borehole Sheets
Figure 1 – Location Plan
Attachment A – Laboratory Certificates of Analysis

https://golderassociates.sharepoint.com/sites/150743/project files/6 deliverables/m01-rev0 - final/21482896-m01-rev0 stantec st rose ps class ea windsor_excesssoil_03nov2021.docx

Table A: Summary of Soil Samples Collected and Results of Laboratory Analysis

Sample ID	Depth (mbgs)[i]	Description of Soil Material Encountered	Parameters Analysed								Exceedances of MECP Excess Soil Quality Standards (ESQS)[ii]		
			Inorganics[iii]				Organics[iv]						
			Metals / Hydrides (O.Reg. 406/19)	Other ORP (O.Reg. 406/19)	EC / SAR	pH	PHC F2-F4	PHC F1 / VOC (inc. BTEX)	sVOC (incl. PAHs)	PCBs	Table 1 ESQS[v] (Full Depth, Background, Agricultural or Other Property Use)	Table 2.1 (Full Depth, Potable, Agricultural Land Use)	Table 3.1 (Full Depth, Non-Potable, Industrial / Commercial / Community Land Use)
BH-101-2	0.8 – 1.4	**FILL,** sandy silty clay, trace gravel, with organics, topsoil layers, and cobbles; brown to dark brown	●	●	●	●	●	●	●	-	*None*	*None*	*None*
BH-101-2-DUP	0.8 – 1.4	**FILL,** sandy silty clay, trace gravel, with organics, topsoil layers, and cobbles; brown to dark brown	●	●	●	●	●	●	●	-	EC *(492 µS/cm vs SCS of 470 µS/cm)* SAR *(1.13 µg/g vs SCS of 1 µg/g)*	*None*	*None*
BH-101-3	1.5 – 2.1	**FILL,** sandy silty clay, trace gravel, with organics, topsoil layers, and cobbles; brown to dark brown	●	●	●	●	●	●	●	-	*None*	*None*	*None*
BH-101-4	2.3 – 2.9	(CL) sandy **SILTY CLAY,** trace gravel; mottled brown and grey	●	●	●	●	●	-	●	-	Metals (Molybdenum) *(3.2 µg/g vs SCS of 2 µg/g)*	*None*	*None*
BH-101-5	3.0 – 3.6	(CL) sandy **SILTY CLAY,** trace gravel; mottled brown and grey	●	●	●	●	●	●	●	-	*None*	*None*	*None*
BH-102B-1	1.5 – 2.1	**FILL,** sandy silty clay, trace gravel, with organics and cobbles; grey	●	●	●	●	●	●	●	-	SAR *(1.19 µg/g vs SCS of 1 µg/g)* VOC (Xylenes, total) *(0.09 µg/g vs SCS of 0.05 µg/g)* sVOC (Benzo[a]anthracene) *(0.17 µg/g vs SCS of 0.095 µg/g)* sVOC (Benzo[a]pyrene) *(0.27 µg/g vs SCS of 0.05 µg/g)* sVOC (Benzo[k]fluoranthene) *(0.11 µg/g vs SCS of 0.05 µg/g)* sVOC (Fluoranthene) *(0.29 µg/g vs SCS of 0.24 µg/g)* sVOC (Indeno [1,2,3-cd] pyrene) *(0.22 µg/g vs SCS of 0.11 µg/g)* sVOC (Pyrene) *(0.23 µg/g vs SCS of 0.19 µg/g)*	*None*	*None*

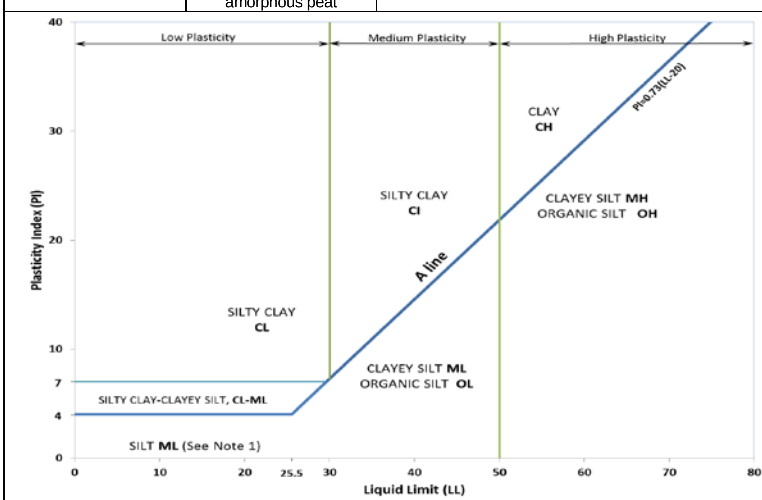
Sample ID	Depth (mbgs)[i]	Description of Soil Material Encountered	Parameters Analysed: Inorganics[iii] – Metals / Hydrides (O.Reg. 406/19)	Other ORP (O.Reg. 406/19)	EC / SAR	pH	Organics[iv] – PHC F2-F4	PHC F1 / VOC (inc. BTEX)	sVOC (incl. PAHs)	PCBs	Exceedances of MECP Excess Soil Quality Standards (ESQS)[ii] – Table 1 ESQS[v] (Full Depth, Background, Agricultural or Other Property Use)	Table 2.1 (Full Depth, Potable, Agricultural Land Use)	Table 3.1 (Full Depth, Non-Potable, Industrial / Commercial / Community Land Use)
BH-102B-2A	2.3 – 2.6	**FILL,** sandy silty clay, trace gravel, with organics and cobbles; grey	●	●	●	●	●	●	●	-	VOC (Hexane) *(0.10 µg/g vs SCS of 0.05 µg/g)* VOC (Xylenes, total) *(0.34 µg/g vs SCS of 0.05 µg/g)* sVOC (Benzo[a]pyrene) *(0.07 µg/g vs SCS of 0.05 µg/g)*	VOC (Xylenes, total) *(0.34 µg/g vs SCS of 0.091 µg/g)*	*None*
BH-102B-2B	2.6 – 2.9	(CL) sandy **SILTY CLAY**, trace gravel; grey and mottled brown	●	●	●	●	●	-	●	-	*None*	*None*	*None*
BH-102B-3	3.0 – 3.6	(CL) sandy **SILTY CLAY**, trace gravel, with oxidized fissures; brown	●	●	●	●	●	●	●	-	*None*	*None*	*None*

[i] All sample depths are expressed as metres below ground surface (mbgs).
[ii] Ontario Ministry of Environment, Conservation and Parks (MECP), formerly the Ministry of Environment and Climate Change (MOECC), formerly the Ministry of Environment (MOE).
[iii] Inorganic parameters: Ontario Regulation (O.Reg.) 406/19 metals and metal hydrides, electrical conductivity (EC), sodium adsorption ratio (SAR), pH. Other Regulated Parameters (ORP) include free cyanide, boron (available), hexavalent chromium and mercury.
[iv] Organic parameters: Petroleum hydrocarbons (PHC), F1 to F4 fractions and benzene, toluene, ethylbenzene and total xylenes (BTEX), volatile organic compounds (VOC), semi-volatile organic compounds (sVOC) (including polycyclic aromatic hydrocarbons, PAHs).
[v] MECP, 2020. Rules for Soil Management and Excess Soil Quality Standards. Adopted by reference in O.Reg.406/19 (On-Site and Excess Soil Management) made under the Environmental Protection Act, R.S.O. 1990, c. E.19 (EPA), updated December 8, 2020.

The WSP Canada Inc. Soil Classification System is based on the Unified Soil Classification System (USCS)

Organic or Inorganic	Soil Group	Type of Soil		Gradation or Plasticity	$Cu = \frac{D_{60}}{D_{10}}$	$Cc = \frac{(D_{30})^2}{D_{10} x D_{60}}$	Organic Content	USCS Group Symbol	Group Name
INORGANIC (Organic Content ≤30% by mass)	COARSE-GRAINED SOILS (>50% by mass is larger than 0.075 mm)	GRAVELS (>50% by mass of coarse fraction is larger than 4.75 mm)	Gravels with ≤12% fines (by mass)	Poorly Graded	<4	≤1 or ≥3	≤30%	GP	GRAVEL
				Well Graded	≥4	1 to 3		GW	GRAVEL
			Gravels with >12% fines (by mass)	Below A Line	n/a			GM	SILTY GRAVEL
				Above A Line	n/a			GC	CLAYEY GRAVEL
		SANDS (≥50% by mass of coarse fraction is smaller than 4.75 mm)	Sands with ≤12% fines (by mass)	Poorly Graded	<6	≤1 or ≥3		SP	SAND
				Well Graded	≥6	1 to 3		SW	SAND
			Sands with >12% fines (by mass)	Below A Line	n/a			SM	SILTY SAND
				Above A Line	n/a			SC	CLAYEY SAND

Organic or Inorganic	Soil Group	Type of Soil	Laboratory Tests	Field Indicators					Organic Content	USCS Group Symbol	Primary Name
				Dilatancy	Dry Strength	Shine Test	Thread Diameter	Toughness (of 3 mm thread)			
INORGANIC (Organic Content ≤30% by mass)	FINE-GRAINED SOILS (≥50% by mass is smaller than 0.075 mm)	SILTS (Non-Plastic or PI and LL plot below A-Line on Plasticity Chart below)	Liquid Limit <50	Rapid	None	None	>6 mm	N/A (can't roll 3 mm thread)	<5%	ML	SILT
				Slow	None to Low	Dull	3mm to 6 mm	None to low	<5%	ML	CLAYEY SILT
				Slow to very slow	Low to medium	Dull to slight	3mm to 6 mm	Low	5% to 30%	OL	ORGANIC SILT
			Liquid Limit ≥50	Slow to very slow	Low to medium	Slight	3mm to 6 mm	Low to medium	<5%	MH	CLAYEY SILT
				None	Medium to high	Dull to slight	1 mm to 3 mm	Medium to high	5% to 30%	OH	ORGANIC SILT
		CLAYS (PI and LL plot above A-Line on Plasticity Chart below)	Liquid Limit <30	None	Low to medium	Slight to shiny	~ 3 mm	Low to medium	0% to 30% **(see Note 2)**	CL	SILTY CLAY
			Liquid Limit 30 to 50	None	Medium to high	Slight to shiny	1 mm to 3 mm	Medium		CI	SILTY CLAY
			Liquid Limit ≥50	None	High	Shiny	<1 mm	High		CH	CLAY
HIGHLY ORGANIC SOILS (Organic Content >30% by mass)		Peat and mineral soil mixtures							30% to 75%	PT	SILTY PEAT, SANDY PEAT
		Predominantly peat, may contain some mineral soil, fibrous or amorphous peat							75% to 100%		PEAT



Note 1 – Fine grained materials with PI and LL that plot in this area are named (ML) SILT with slight plasticity. Fine-grained materials which are non-plastic (i.e. a PL cannot be measured) are named SILT.

Note 2 – For soils with <5% organic content, include the descriptor "trace organics" for soils with between 5% and 30% organic content include the prefix "organic" before the Primary name.

Dual Symbol — A dual symbol is two symbols separated by a hyphen, for example, GP-GM, SW-SC and CL-ML.

For non-cohesive soils, the dual symbols must be used when the soil has between 5% and 12% fines (i.e. to identify transitional material between "clean" and "dirty" sand or gravel.

For cohesive soils, the dual symbol must be used when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart (see Plasticity Chart at left).

Borderline Symbol — A borderline symbol is two symbols separated by a slash, for example, CL/CI, GM/SM, CL/ML.

A borderline symbol should be used to indicate that the soil has been identified as having properties that are on the transition between similar materials. In addition, a borderline symbol may be used to indicate a range of similar soil types within a stratum.

ABBREVIATIONS AND TERMS USED ON RECORDS OF BOREHOLES AND TEST PITS

PARTICLE SIZES OF CONSTITUENTS

Soil Constituent	Particle Size Description	Millimetres	Inches (US Std. Sieve Size)
BOULDERS	Not Applicable	>300	>12
COBBLES	Not Applicable	75 to 300	3 to 12
GRAVEL	Coarse Fine	19 to 75 4.75 to 19	0.75 to 3 (4) to 0.75
SAND	Coarse Medium Fine	2.00 to 4.75 0.425 to 2.00 0.075 to 0.425	(10) to (4) (40) to (10) (200) to (40)
SILT/CLAY	Classified by plasticity	<0.075	< (200)

MODIFIERS FOR SECONDARY AND MINOR CONSTITUENTS

Percentage by Mass	Modifier
>35	Use 'and' to combine major constituents (*i.e.,* SAND and GRAVEL)
> 12 to 35	Primary soil name prefixed with "gravelly, sandy, SILTY, CLAYEY" as applicable
> 5 to 12	some
≤ 5	trace

PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split-spoon sampler for a distance of 300 mm (12 in.). Values reported are as recorded in the field and are uncorrected.

Cone Penetration Test (CPT)
An electronic cone penetrometer with a 60° conical tip and a project end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and sleeve frictions are recorded electronically at 25 mm penetration intervals.

Dynamic Cone Penetration Resistance (DCPT); N_d:
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH: Sampler advanced by hydraulic pressure
PM: Sampler advanced by manual pressure
WH: Sampler advanced by static weight of hammer
WR: Sampler advanced by weight of sampler and rod

SAMPLES

AS	Auger sample
BS	Block sample
CS	Chunk sample
DD	Diamond Drilling
DO or DP	Seamless open ended, driven or pushed tube sampler – note size
DS	Denison type sample
GS	Grab Sample
MC	Modified California Samples
MS	Modified Shelby (for frozen soil)
RC	Rock core
SC	Soil core
SS	Split spoon sampler – note size
ST	Slotted tube
TO	Thin-walled, open – note size (Shelby tube)
TP	Thin-walled, piston – note size (Shelby tube)
WS	Wash sample

SOIL TESTS

w	water content
PL , w_p	plastic limit
LL , w_L	liquid limit
C	consolidation (oedometer) test
CHEM	chemical analysis (refer to text)
CID	consolidated isotropically drained triaxial test[1]
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	relative density (specific gravity, Gs)
DS	direct shear test
GS	specific gravity
M	sieve analysis for particle size
MH	combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	organic content test
SO_4	concentration of water-soluble sulphates
UC	unconfined compression test
UU	unconsolidated undrained triaxial test
V (FV)	field vane (LV-laboratory vane test)
γ	unit weight

1. Tests anisotropically consolidated prior to shear are shown as CAD, CAU.

NON-COHESIVE (COHESIONLESS) SOILS

Compactness[2]

Term	SPT 'N' (blows/0.3m)[1]
Very Loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	>50

1. SPT 'N' in accordance with ASTM D1586, uncorrected for the effects of overburden pressure.
2. Definition of compactness terms are based on SPT 'N' ranges as provided in Terzaghi, Peck and Mesri (1996). Many factors affect the recorded SPT 'N' value, including hammer efficiency (which may be greater than 60% in automatic trip hammers), overburden pressure, groundwater conditions, and grainsize. As such, the recorded SPT 'N' value(s) should be considered only an approximate guide to the soil compactness. These factors need to be considered when evaluating the results, and the stated compactness terms should not be relied upon for design or construction.

Field Moisture Condition

Term	Description
Dry	Soil flows freely through fingers.
Moist	Soils are darker than in the dry condition and may feel cool.
Wet	As moist, but with free water forming on hands when handled.

COHESIVE SOILS

Consistency

Term	Undrained Shear Strength (kPa)	SPT 'N'[1,2] (blows/0.3m)
Very Soft	<12	0 to 2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	>200	>30

1. SPT 'N' in accordance with ASTM D1586, uncorrected for overburden pressure effects; approximate only.
2. SPT 'N' values should be considered ONLY an approximate guide to consistency; for sensitive clays (e.g., Champlain Sea clays), the N-value approximation for consistency terms does NOT apply. Rely on direct measurement of undrained shear strength or other manual observations.

Water Content

Term	Description
w < PL	Material is estimated to be drier than the Plastic Limit.
w ~ PL	Material is estimated to be close to the Plastic Limit.
w > PL	Material is estimated to be wetter than the Plastic Limit.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$	x or log x, logarithm of x to base 10
g	acceleration due to gravity
t	time

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta\,\sigma$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
υ	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma$ - u)
σ'_{vo}	initial effective overburden stress
σ_1, σ_2, σ_3	principal stress (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3)/3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) (formerly G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_l or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity index = $(w_l - w_p)$
NP	non-plastic
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_C	consistency index = $(w_l - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (over-consolidated range)
C_s	swelling index
C_α	secondary compression index
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
c_h	coefficient of consolidation (horizontal direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	over-consolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p, τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c'	effective cohesion
c_u, S_u	undrained shear strength (ϕ = 0 analysis)
p	mean total stress $(\sigma_1 + \sigma_3)/2$
p'	mean effective stress $(\sigma'_1 + \sigma'_3)/2$
q	$(\sigma_1 - \sigma_3)/2$ or $(\sigma'_1 - \sigma'_3)/2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes:
1. $\tau = c' + \sigma' \tan \phi'$
2. shear strength = (compressive strength)/2

RECORD OF BOREHOLE BH-101

PROJECT: 21482896

LOCATION: N 4688628.0 , E 338898.0

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

BORING DATE: October 4, 2021

DRILLING CONTRACTOR: Henderson Drilling Inc.

DATUM: LOCAL

BORING METHOD: POWER AUGER, 83mm ID HOLLOW STEM

Depth (m)	Description	Elev. / Depth (m)
0	GROUND SURFACE	100.76
0.00	**TOPSOIL**, sandy silty clay, with rootlets; dark brown	0.00
0.10	**FILL**, sandy silty clay, trace gravel, with organics, topsoil layers, and cobbles, black sand pocket at about elev. 99.2m; soft to stiff	0.10
2.13	**FILL**, sand and gravel, some silt, with clay pockets; dark grey	98.63 / 2.13
2.44	(CL) sandy **SILTY CLAY**, trace gravel; mottled brown and grey; stiff to very stiff	98.32 / 2.44
3.73	(CL) sandy **SILTY CLAY**, trace gravel, with oxidized fissures; brown, very stiff	97.03 / 3.73
5.64	(CL) sandy **SILTY CLAY**, trace gravel, with sand layers; grey; very soft to firm	95.12 / 5.64

--- CONTINUED NEXT PAGE ---

Sample No.	Type	Blows/0.3m	HEX / IBL
1	SS	3	0/0
2	SS	12	0/0
3	SS	7	0/0
4	SS	8	5/0
5	SS	21	0/0
6	SS	21	5/0
7	SS	20	0/0
8	SS	8	0/0
9	SS	WH	0/0
10	SS	WH	0/0

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ : 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT: Wp W Wl : 10 20 30 40

ADDITIONAL LAB. TESTING

INSTALLATION AND GROUNDWATER OBSERVATIONS

ELEVATION: 100, 99, 98, 97, 96, 95, 94, 93, 92, 91

DEPTH SCALE METRES: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

DEPTH SCALE 1 : 50

GOLDER MEMBER OF WSP

LOGGED: AM

CHECKED: CS

PROJECT: 21482896

RECORD OF BOREHOLE BH-101

LOCATION: N 4688628.0 , E 338898.0

BORING DATE: October 4, 2021
DRILLING CONTRACTOR: Henderson Drilling Inc.

DATUM: LOCAL

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	ELEVATION	SHEAR STRENGTH Cu, kPa	WATER CONTENT PERCENT	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
		--- CONTINUED FROM PREVIOUS PAGE ---									
10 – 15.85	POWER AUGER, 83mm ID HOLLOW STEM	(CL) sandy **SILTY CLAY**, trace gravel,with sand layers; grey; very soft to firm					90				
11				11	SS	WH		0/1			
							89				
12				12	SS	WH		0/0		MH	
							88				
13							87				
14				13	SS	WH		0/0			Enc. WL. Groundwater encountered at about elev. 86.7m during drilling on October 4, 2021
15							86				
			84.91 / 15.85	14	SS	WH	85	0/0			
16		END OF BOREHOLE									
17							84				
18											
19											
20											

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80
SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ ; 20 40 60 80
HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6} 10^{-5} 10^{-4} 10^{-3}
WATER CONTENT PERCENT: Wp ├─○W─┤ Wl ; 10 20 30 40

DEPTH SCALE
1 : 50

GOLDER
MEMBER OF WSP

LOGGED: AM
CHECKED: CS

RECORD OF BOREHOLE BH-102A

PROJECT: 21482896

LOCATION: N 4688657.0 , E 338886.0

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

BORING DATE: October 4, 2021
DRILLING CONTRACTOR: Henderson Drilling Inc.

SHEET 1 OF 1

DATUM: LOCAL

Boring method: POWER AUGER, 83mm ID HOLLOW STEM

DEPTH SCALE METRES	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLE NUMBER	TYPE	BLOWS/0.3m	ELEVATION	DYNAMIC PENETRATION RESISTANCE / SHEAR STRENGTH Cu, kPa	WATER CONTENT PERCENT	INSTALLATION AND GROUNDWATER OBSERVATIONS
0	GROUND SURFACE	100.63					HEX / IBL		
	TOPSOIL, sandy silty clay, with rootlets; dark brown	0.00							
	FILL, sandy silty clay, trace gravel, with organics and cobbles; brown to dark brown; stiff	0.15	1	SS	11		0 / 0	○	Borehole dry during drilling on October 4, 2021
						100			
1			2	SS	9		0 / 0	○	
			3	SS	58/152mm				
	END OF BOREHOLE AUGER REFUSAL	98.95 1.68							
2									
						98			

Legend: SHEAR STRENGTH nat V. + Q - ● rem V. ⊕ U - ○; HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}); WATER CONTENT PERCENT Wp —○W— Wl (10, 20, 30, 40); ADDITIONAL LAB. TESTING

DEPTH SCALE

1 : 50

GOLDER MEMBER OF WSP

LOGGED: AM

CHECKED: CS

PROJECT: 21482896

RECORD OF BOREHOLE BH-102B

SHEET 1 OF 2

LOCATION: N 4688656.0 , E 338886.0

BORING DATE: October 4, 2021

DRILLING CONTRACTOR: Henderson Drilling Inc.

DATUM: LOCAL

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

BORING METHOD: POWER AUGER, 83mm ID HOLLOW STEM

DEPTH SCALE METRES	DESCRIPTION	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION / SHEAR STRENGTH Cu, kPa	WATER CONTENT
	Stratigraphy from 0 to 1.52m inferred from BH-102A					HEX / IBL	
0	GROUND SURFACE	100.63					
	TOPSOIL, sandy silty clay, with rootlets; dark brown	0.00					
	FILL, sandy silt clay, trace gravel, with organics and cobbles; brown to dark brown; stiff	0.15					
	FILL, sandy silt clay, trace gravel, with organics and cobbles; grey; firm	99.11 / 1.52	1	SS	4	0 / 0	○
			2	SS	5	0 / 0	○
	(CL) sandy **SILTY CLAY**, trace gravel; grey and mottled brown; firm	98.04 / 2.59					
	(CL) sandy **SILTY CLAY**, trace gravel, with oxidized fissures; brown; stiff to very stiff	97.74 / 2.89	3	SS	16	0 / 0	○
			4	SS	19	0 / 0	○
			5	SS	13	0 / 1	○
	(CL-ML) sandy **SILTY CLAY** to **CLAYEY SILT**, trace gravel, with sand layers; grey; very soft to firm	94.99 / 5.64	6	SS	2	0 / 0	○
						⊕ +	
						⊕ +	
			7	SS	WH	0 / 0	○
			8	SS	1	0 / 0	○

--- CONTINUED NEXT PAGE ---

DEPTH SCALE 1 : 50

GOLDER MEMBER OF WSP

LOGGED: AM

CHECKED: CS

LDN_BHS_07 21482896.GPJ GLDR_LON.GDT 29/10/21 12:16 DATA INPUT: AM

PROJECT: 21482896

RECORD OF BOREHOLE BH-102B

LOCATION: N 4688656.0 , E 338886.0

BORING DATE: October 4, 2021

DRILLING CONTRACTOR: Henderson Drilling Inc.

DATUM: LOCAL

SAMPLER HAMMER, 63.5 kg; DROP, 760 mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	ELEV. DEPTH (m)	SAMPLE NUMBER	TYPE	BLOWS/0.3m	ELEVATION	SHEAR STRENGTH Cu, kPa / DYNAMIC PENETRATION	WATER CONTENT PERCENT	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
		--- CONTINUED FROM PREVIOUS PAGE ---									
	POWER AUGER, 83mm ID HOLLOW STEM	(CL-ML) sandy **SILTY CLAY** to **CLAYEY SILT**, trace gravel, with sand layers; grey; very soft to firm		8	SS	1	91				
10								rem V. ⊕, nat V. +			
							90				
11				9	SS	2		0/0	Wp ├─○─┤ Wl	MH	
							89	rem V. ⊕, nat V. +			
12								rem V. ⊕, nat V. +			
				10	SS	WH		5/1	○		Enc. WL ▽
			87.83				88				Groundwater encountered at about elev. 88.1m during drilling on October 4, 2021
		END OF BOREHOLE	12.80								
13											
							87				
14											
15											
16											
17											
18											
19											

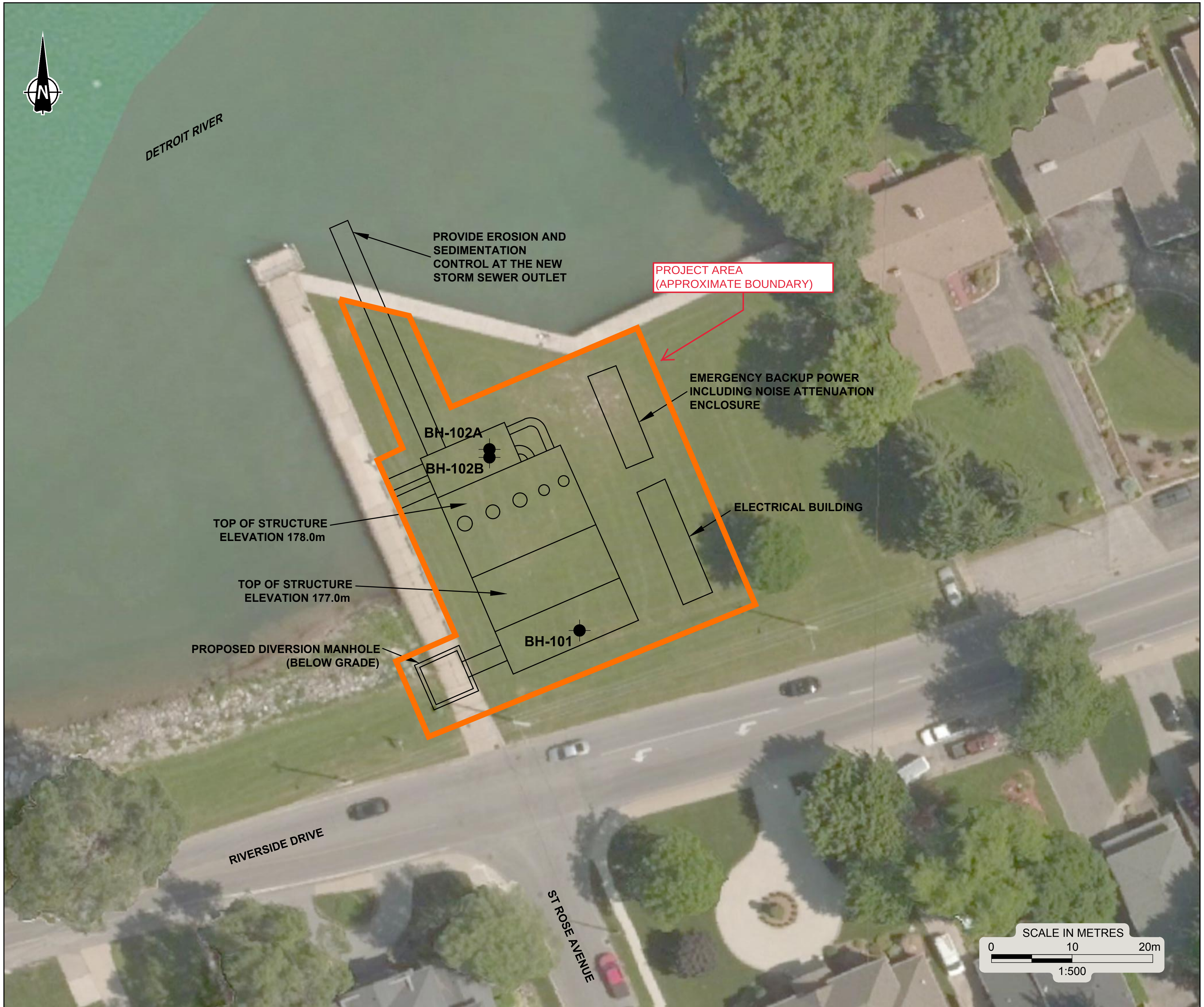
DEPTH SCALE 1 : 50

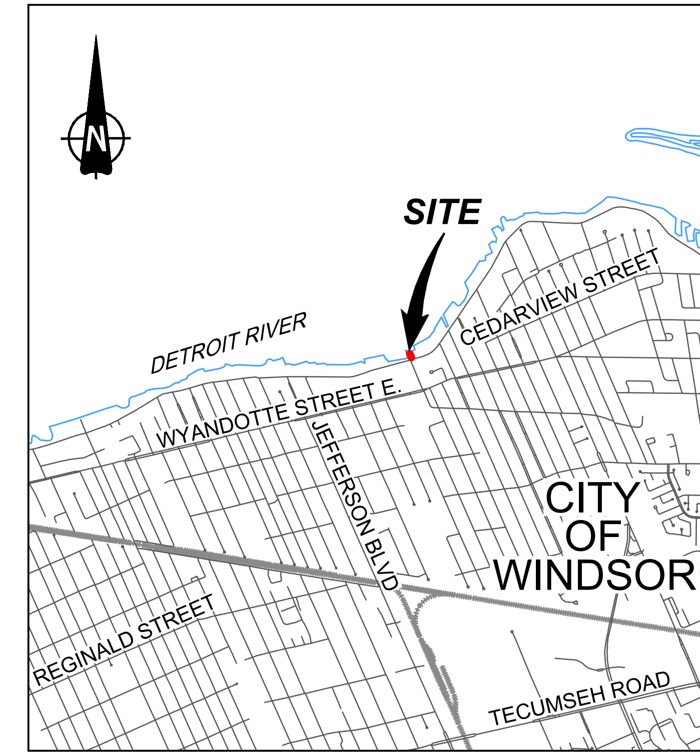
GOLDER MEMBER OF WSP

LOGGED: AM

CHECKED: CS

LDN_BHS_07 21482896.GPJ GLDR_LON.GDT 29/10/21 12:16 DATA INPUT: AM





KEY PLAN

LEGEND

BOREHOLE

REFERENCE

DRAWING BASED ON BING IMAGE AS OF OCTOBER 22, 2021 (IMAGE DATE UNKNOWN);
ST. ROSE PUMP STATION LAYOUT SCHEMATIC, DILLON CONSULTING, PROVIDED BY STANTEC CONSULTING LTD, JULY 20, 2021; AND
CANMAP STREETFILES V2008.4.

NOTES

THIS DRAWING IS SCHEMATIC ONLY AND IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

BING IMAGERY USED FOR ILLUSTRATION PURPOSES ONLY AND NOT TO BE USED FOR MEASUREMENTS.

ALL LOCATIONS ARE APPROXIMATE.

PROJECT

PRELIMINARY ENVIRONMENTAL SOIL CHARACTERIZATION FOR PROPOSED ST. ROSE PUMP STATION
WINDSOR, ONTARIO

TITLE

LOCATION PLAN

GOLDER
MEMBER OF WSP

PROJECT No.	21482896	FILE No.	21482896-1000-M01001
		SCALE	AS SHOWN
		REV.	
CADD	AM	Oct 26/21	
CHECK			

FIGURE 1

Drawing file: 21482896-1000-M01001.dwg Oct 29, 2021 - 12:01pm Original Format is Tabloid 279mm x 432mm Client: Stantec

25mm 0

ATTACHMENT A

Laboratory Certificate of Anlaysis

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351 Nash Road North, unit 9B
Hamilton, ON L8H 7P4
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Golder Associates Ltd. (Windsor)

1825 Provincial Rd
WIndsor, ON N8W 5V7
Attn: Peter Giuliani

Client PO:
Project: 21482896
Custody: 62407, 62408

Report Date: 28-Oct-2021
Order Date: 6-Oct-2021

Revised Report

Order #: 2141425

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID	Paracel ID	Client ID
2141425-01	BH101-2		
2141425-02	BH101-2-DUP		
2141425-03	BH101-5		
2141425-04	BH102B-1		
2141425-05	BH102B-3		
2141425-07	BH101-3		
2141425-08	BH101-4		
2141425-11	BH102B-2A		
2141425-12	BH102B-2B		

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: **Golder Associates Ltd. (Windsor)**
Client PO:

Report Date: 28-Oct-2021
Order Date: 6-Oct-2021
Project Description: 21482896

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.8 - ICP-MS	20-Oct-21	20-Oct-21
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	18-Oct-21	13-Oct-21
Conductivity	MOE E3138 - probe @25 °C, water ext	21-Oct-21	14-Oct-21
Cyanide, free	MOE E3015 - Auto Colour, water extraction	15-Oct-21	8-Oct-21
Mercury by CVAA	EPA 7471B - CVAA, digestion	20-Oct-21	13-Oct-21
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	21-Oct-21	14-Oct-21
PHC F1	CWS Tier 1 - P&T GC-FID	15-Oct-21	12-Oct-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	8-Oct-21	13-Oct-21
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	20-Oct-21	20-Oct-21
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	12-Oct-21	13-Oct-21
REG 153: VOCs by P&T GC-MS	EPA 8260 - P&T GC-MS	8-Oct-21	12-Oct-21
SAR	Calculated	20-Oct-21	14-Oct-21
Solids, %	Gravimetric, calculation	21-Oct-21	21-Oct-21

Certificate of Analysis

Client: Golder Associates Ltd. (Windsor)

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

Summary of Exceedances

(If this page is blank then there are no exceedances)

Only those criteria that a sample exceeds will be highlighted in red

Regulatory Comparison:

Paracel Laboratories has provided regulatory guidelines on this report for informational purposes only and makes no representations or warranties that the data is accurate or reflects the current regulatory values. The user is advised to consult with the appropriate official regulations to evaluate compliance. Sample results that are highlighted have exceeded the selected regulatory limit. Calculated uncertainty estimations have not been applied for determining regulatory exceedances. Regulatory limts displayed in brackets, (), applies to medium and fine textured soils.

Criteria:

Client ID	Analyte	MDL / Units	Result	Reg 153/04 (2011)-Table 1 Agricultural
BH101-2-DUP	Conductivity	5 uS/cm	492	0.47 mS/cm
BH101-2-DUP	SAR	0.01 N/A	1.13	1 N/A
BH102B-1	Benzo [k] fluoranthene	0.02 ug/g	0.11	0.05 ug/g
BH102B-1	Pyrene	0.02 ug/g	0.23	0.19 ug/g
BH102B-1	Benzo [a] anthracene	0.02 ug/g	0.17	0.095 ug/g
BH102B-1	Benzo [a] pyrene	0.02 ug/g	0.27	0.05 ug/g
BH102B-1	Fluoranthene	0.02 ug/g	0.29	0.24 ug/g
BH102B-1	Indeno [1,2,3-cd] pyrene	0.02 ug/g	0.22	0.11 ug/g
BH102B-1	Xylenes, total	0.05 ug/g	0.09	0.05 ug/g
BH102B-1	SAR	0.01 N/A	1.19	1 N/A
BH101-4	Molybdenum	1.0 ug/g	3.2	2 ug/g
BH102B-2A	Benzo [a] pyrene	0.02 ug/g	0.07	0.05 ug/g
BH102B-2A	Hexane	0.05 ug/g	0.10	0.05 ug/g
BH102B-2A	Xylenes, total	0.05 ug/g	0.34	0.05 ug/g

Certificate of Analysis

Client: Golder Associates Ltd. (Windsor)

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

Client ID:		BH101-2	BH101-2-DUP	BH101-5	BH102B-1	**Criteria:**	
Sample Date:		04-Oct-2021	04-Oct-2021	04-Oct-2021	04-Oct-2021	**Reg 153/04 (2011)-Table 1 Agricultural**	
Sample ID:		2141425-01	2141425-02	2141425-03	2141425-04		
Matrix:		Soil	Soil	Soil	Soil		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	86.7	87.6	88.8	84.0		
General Inorganics							
SAR	0.01 N/A	0.90	1.13	0.57	1.19	1	N/A
Conductivity	5 uS/cm	331	492	157	314	0.47	mS/cm
Cyanide, free	0.03 ug/g	<0.03	<0.03	<0.03	<0.03	0.051	ug/g
pH	0.05 pH Units	7.45	7.53	7.56	7.74	5 - 9	pH units
Metals							
Antimony	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	1	ug/g
Arsenic	1.0 ug/g	8.0	8.0	6.1	8.1	11	ug/g
Barium	1.0 ug/g	80.8	87.1	65.1	73.4	210	ug/g
Beryllium	0.5 ug/g	0.6	0.8	0.6	0.7	2.5	ug/g
Boron	5.0 ug/g	<5.0	<5.0	7.0	5.9	36	ug/g
Boron, available	0.5 ug/g	0.8	1.2	<0.5	1.1		
Cadmium	0.5 ug/g	<0.5	<0.5	<0.5	<0.5	1	ug/g
Chromium	5.0 ug/g	18.9	23.3	20.5	21.3	67	ug/g
Chromium (VI)	0.2 ug/g	<0.2	<0.2	<0.2	<0.2	0.66	ug/g
Cobalt	1.0 ug/g	7.6	9.0	8.0	8.8	19	ug/g
Copper	5.0 ug/g	19.3	18.0	15.5	16.4	62	ug/g
Lead	1.0 ug/g	16.8	17.7	7.6	14.3	45	ug/g
Mercury	0.1 ug/g	<0.1	<0.1	<0.1	<0.1	0.16	ug/g
Molybdenum	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	2	ug/g
Nickel	5.0 ug/g	20.8	24.3	22.7	23.2	37	ug/g
Selenium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	1.2	ug/g

Certificate of Analysis

Client: Golder Associates Ltd. (Windsor)

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

	Client ID:	BH101-2	BH101-2-DUP	BH101-5	BH102B-1	**Criteria:**	
	Sample Date:	04-Oct-2021	04-Oct-2021	04-Oct-2021	04-Oct-2021	**Reg 153/04 (2011)-Table 1 Agricultural**	
	Sample ID:	2141425-01	2141425-02	2141425-03	2141425-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Silver	0.3 ug/g	<0.3	<0.3	<0.3	<0.3	0.5	ug/g
Thallium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	1	ug/g
Uranium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	1.9	ug/g
Vanadium	10.0 ug/g	28.3	34.1	30.9	33.3	86	ug/g
Zinc	20.0 ug/g	55.4	64.3	50.8	63.1	290	ug/g
Volatiles							
Acetone	0.50 ug/g	<0.50	<0.50	<0.50	<0.50	0.5	ug/g
Benzene	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	0.02	ug/g
Bromodichloromethane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Bromoform	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Bromomethane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Carbon Tetrachloride	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Chlorobenzene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Chloroform	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Dibromochloromethane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Dichlorodifluoromethane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
1,2-Dichlorobenzene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
1,3-Dichlorobenzene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
1,4-Dichlorobenzene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
1,1-Dichloroethane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
1,2-Dichloroethane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
1,1-Dichloroethylene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
cis-1,2-Dichloroethylene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
trans-1,2-Dichloroethylene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g

Certificate of Analysis

Client: Golder Associates Ltd. (Windsor)

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

	Client ID:	BH101-2	BH101-2-DUP	BH101-5	BH102B-1	**Criteria:**	
	Sample Date:	04-Oct-2021	04-Oct-2021	04-Oct-2021	04-Oct-2021	**Reg 153/04 (2011)-Table 1 Agricultural**	
	Sample ID:	2141425-01	2141425-02	2141425-03	2141425-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
1,2-Dichloropropane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
cis-1,3-Dichloropropylene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05		
trans-1,3-Dichloropropylene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05		
1,3-Dichloropropene, total	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Ethylbenzene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Ethylene dibromide (dibromoethane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Hexane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g	<0.50	<0.50	<0.50	<0.50	0.5	ug/g
Methyl Isobutyl Ketone	0.50 ug/g	<0.50	<0.50	<0.50	<0.50	0.5	ug/g
Methyl tert-butyl ether	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Methylene Chloride	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Styrene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
1,1,1,2-Tetrachloroethane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
1,1,2,2-Tetrachloroethane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Tetrachloroethylene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Toluene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.2	ug/g
1,1,1-Trichloroethane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
1,1,2-Trichloroethane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Trichloroethylene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Trichlorofluoromethane	0.05 ug/g	<0.05	<0.05	<0.05	<0.05	0.05	ug/g
Vinyl chloride	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	0.02	ug/g
m,p-Xylenes	0.05 ug/g	<0.05	<0.05	<0.05	0.09		
o-Xylene	0.05 ug/g	<0.05	<0.05	<0.05	<0.05		

Certificate of Analysis

Client: **Golder Associates Ltd. (Windsor)**

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

Client ID:		BH101-2	BH101-2-DUP	BH101-5	BH102B-1	**Criteria:**
Sample Date:		04-Oct-2021	04-Oct-2021	04-Oct-2021	04-Oct-2021	**Reg 153/04 (2011)-Table 1 Agricultural**
Sample ID:		2141425-01	2141425-02	2141425-03	2141425-04	
Matrix:		Soil	Soil	Soil	Soil	
	MDL/Units					
Xylenes, total	0.05 ug/g	<0.05	<0.05	<0.05	0.09	0.05 ug/g
4-Bromofluorobenzene	Surrogate	92.4%	90.8%	91.2%	92.1%	
Dibromofluoromethane	Surrogate	78.7%	80.3%	81.3%	79.6%	
Toluene-d8	Surrogate	99.8%	101%	99.5%	99.8%	
Hydrocarbons						
F1 PHCs (C6-C10)	7 ug/g	<7	<7	<7	<7	17 ug/g
F2 PHCs (C10-C16)	4 ug/g	<4	<4	<4	<4	10 ug/g
F3 PHCs (C16-C34)	8 ug/g	<8	<8	<8	<8	240 ug/g
F4 PHCs (C34-C50)	6 ug/g	<6	<6	<6	<6	120 ug/g
Semi-Volatiles						
Acenaphthene	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	0.05 ug/g
Acenaphthylene	0.02 ug/g	<0.02	<0.02	<0.02	0.07	0.093 ug/g
Anthracene	0.02 ug/g	<0.02	<0.02	<0.02	0.03	0.05 ug/g
Benzo [a] anthracene	0.02 ug/g	0.03	<0.02	<0.02	0.17	0.095 ug/g
Benzo [a] pyrene	0.02 ug/g	0.04	<0.02	<0.02	0.27	0.05 ug/g
Benzo [b] fluoranthene	0.02 ug/g	0.05	<0.02	<0.02	0.27	0.3 ug/g
Benzo [g,h,i] perylene	0.02 ug/g	0.04	<0.02	<0.02	0.19	0.2 ug/g
Benzo [k] fluoranthene	0.02 ug/g	<0.02	<0.02	<0.02	0.11	0.05 ug/g
Chrysene	0.02 ug/g	0.04	<0.02	<0.02	0.18	0.18 ug/g
Dibenzo [a,h] anthracene	0.02 ug/g	<0.02	<0.02	<0.02	0.03	0.1 ug/g
Fluoranthene	0.02 ug/g	0.08	<0.02	<0.02	0.29	0.24 ug/g
Fluorene	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	0.05 ug/g
Indeno [1,2,3-cd] pyrene	0.02 ug/g	0.04	<0.02	<0.02	0.22	0.11 ug/g
1-Methylnaphthalene	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	0.05 ug/g

Certificate of Analysis

Client: **Golder Associates Ltd. (Windsor)**

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

	MDL/Units					**Criteria:**	
Client ID:		BH101-2	BH101-2-DUP	BH101-5	BH102B-1		
Sample Date:		04-Oct-2021	04-Oct-2021	04-Oct-2021	04-Oct-2021		
Sample ID:		2141425-01	2141425-02	2141425-03	2141425-04	**Reg 153/04 (2011)-Table 1 Agricultural**	
Matrix:		Soil	Soil	Soil	Soil		
2-Methylnaphthalene	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	0.05	ug/g
Methylnaphthalene (1&2)	0.03 ug/g	<0.03	<0.03	<0.03	<0.03	0.05	ug/g
Naphthalene	0.01 ug/g	<0.01	<0.01	<0.01	0.01	0.05	ug/g
Phenanthrene	0.02 ug/g	0.05	<0.02	<0.02	0.04	0.19	ug/g
Pyrene	0.02 ug/g	0.05	<0.02	<0.02	0.23	0.19	ug/g
2-Fluorobiphenyl	Surrogate	91.5%	98.1%	90.4%	83.6%		
Terphenyl-d14	Surrogate	99.5%	105%	99.6%	103%		

PARACEL LABORATORIES LTD.

Order #: 2141425

Certificate of Analysis

Client: Golder Associates Ltd. (Windsor)

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

	MDL/Units	BH102B-3	BH101-3	BH101-4	BH102B-2A	Criteria: Reg 153/04 (2011)-Table 1 Agricultural	
Sample Date:		04-Oct-2021	04-Oct-2021	04-Oct-2021	04-Oct-2021		
Sample ID:		2141425-05	2141425-07	2141425-08	2141425-11		
Matrix:		Soil	Soil	Soil	Soil		
Physical Characteristics							
% Solids	0.1 % by Wt.	88.2	85.6	88.2	89.5		
General Inorganics							
SAR	0.01 N/A	0.52	0.88	0.86	0.89	1	N/A
Conductivity	5 uS/cm	164	243	170	326	0.47	mS/cm
Cyanide, free	0.03 ug/g	<0.03	<0.03	<0.03	<0.03	0.051	ug/g
pH	0.05 pH Units	7.55	7.29	7.48	7.83	5 - 9	pH units
Metals							
Antimony	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	1	ug/g
Arsenic	1.0 ug/g	6.9	10.4	8.5	8.2	11	ug/g
Barium	1.0 ug/g	57.0	60.3	67.0	73.3	210	ug/g
Beryllium	0.5 ug/g	0.6	0.6	0.6	0.6	2.5	ug/g
Boron	5.0 ug/g	7.1	11.4	16.6	13.2	36	ug/g
Boron, available	0.5 ug/g	<0.5	0.6	<0.5	0.8		
Cadmium	0.5 ug/g	<0.5	<0.5	<0.5	<0.5	1	ug/g
Chromium	5.0 ug/g	18.8	17.5	16.9	17.9	67	ug/g
Chromium (VI)	0.2 ug/g	<0.2	<0.2	<0.2	<0.2	0.66	ug/g
Cobalt	1.0 ug/g	8.4	8.3	7.3	7.6	19	ug/g
Copper	5.0 ug/g	16.0	18.1	15.9	17.8	62	ug/g
Lead	1.0 ug/g	7.1	11.8	9.1	26.0	45	ug/g
Mercury	0.1 ug/g	<0.1	<0.1	<0.1	<0.1	0.16	ug/g
Molybdenum	1.0 ug/g	<1.0	1.3	3.2	1.6	2	ug/g
Nickel	5.0 ug/g	22.8	22.7	22.2	21.7	37	ug/g
Selenium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	1.2	ug/g

PARACEL LABORATORIES LTD.

Order #: 2141425

Certificate of Analysis

Client: **Golder Associates Ltd. (Windsor)**

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

	Client ID:	BH102B-3	BH101-3	BH101-4	BH102B-2A	**Criteria:**	
	Sample Date:	04-Oct-2021	04-Oct-2021	04-Oct-2021	04-Oct-2021	**Reg 153/04 (2011)-Table 1 Agricultural**	
	Sample ID:	2141425-05	2141425-07	2141425-08	2141425-11		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Silver	0.3 ug/g	<0.3	<0.3	<0.3	<0.3	0.5	ug/g
Thallium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	1	ug/g
Uranium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	1.9	ug/g
Vanadium	10.0 ug/g	29.3	31.8	30.9	28.9	86	ug/g
Zinc	20.0 ug/g	48.8	55.7	55.5	212	290	ug/g
Volatiles							
Acetone	0.50 ug/g	<0.50	<0.50	-	<0.50	0.5	ug/g
Benzene	0.02 ug/g	<0.02	<0.02	-	0.02	0.02	ug/g
Bromodichloromethane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Bromoform	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Bromomethane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Carbon Tetrachloride	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Chlorobenzene	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Chloroform	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Dibromochloromethane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Dichlorodifluoromethane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
1,2-Dichlorobenzene	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
1,3-Dichlorobenzene	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
1,4-Dichlorobenzene	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
1,1-Dichloroethane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
1,2-Dichloroethane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
1,1-Dichloroethylene	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
cis-1,2-Dichloroethylene	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
trans-1,2-Dichloroethylene	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g

PARACEL LABORATORIES LTD.

Order #: 2141425

Certificate of Analysis

Client: Golder Associates Ltd. (Windsor)

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

Client ID:		BH102B-3	BH101-3	BH101-4	BH102B-2A	Criteria:	
Sample Date:		04-Oct-2021	04-Oct-2021	04-Oct-2021	04-Oct-2021	Reg 153/04 (2011)-Table 1 Agricultural	
Sample ID:		2141425-05	2141425-07	2141425-08	2141425-11		
Matrix:	MDL/Units	Soil	Soil	Soil	Soil		
1,2-Dichloropropane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
cis-1,3-Dichloropropylene	0.05 ug/g	<0.05	<0.05	-	<0.05		
trans-1,3-Dichloropropylene	0.05 ug/g	<0.05	<0.05	-	<0.05		
1,3-Dichloropropene, total	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Ethylbenzene	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Ethylene dibromide (dibromoethane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Hexane	0.05 ug/g	<0.05	<0.05	-	0.10	0.05	ug/g
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g	<0.50	<0.50	-	<0.50	0.5	ug/g
Methyl Isobutyl Ketone	0.50 ug/g	<0.50	<0.50	-	<0.50	0.5	ug/g
Methyl tert-butyl ether	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Methylene Chloride	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Styrene	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
1,1,1,2-Tetrachloroethane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
1,1,2,2-Tetrachloroethane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Tetrachloroethylene	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Toluene	0.05 ug/g	<0.05	<0.05	-	<0.05	0.2	ug/g
1,1,1-Trichloroethane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
1,1,2-Trichloroethane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Trichloroethylene	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Trichlorofluoromethane	0.05 ug/g	<0.05	<0.05	-	<0.05	0.05	ug/g
Vinyl chloride	0.02 ug/g	<0.02	<0.02	-	<0.02	0.02	ug/g
m,p-Xylenes	0.05 ug/g	<0.05	<0.05	-	0.24		
o-Xylene	0.05 ug/g	<0.05	<0.05	-	0.10		

Certificate of Analysis

Client: Golder Associates Ltd. (Windsor)

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

Client ID:		BH102B-3	BH101-3	BH101-4	BH102B-2A	**Criteria:**	
Sample Date:		04-Oct-2021	04-Oct-2021	04-Oct-2021	04-Oct-2021	**Reg 153/04 (2011)-Table 1 Agricultural**	
Sample ID:		2141425-05	2141425-07	2141425-08	2141425-11		
Matrix:		Soil	Soil	Soil	Soil		
	MDL/Units						
Xylenes, total	0.05 ug/g	<0.05	<0.05	-	0.34	0.05	ug/g
4-Bromofluorobenzene	Surrogate	92.3%	87.6%	-	87.6%		
Dibromofluoromethane	Surrogate	79.8%	73.0%	-	72.3%		
Toluene-d8	Surrogate	100%	99.9%	-	101%		
Hydrocarbons							
F1 PHCs (C6-C10)	7 ug/g	<7	<7	-	<7	17	ug/g
F2 PHCs (C10-C16)	4 ug/g	<4	<4	<4	<4	10	ug/g
F3 PHCs (C16-C34)	8 ug/g	<8	14	<8	9	240	ug/g
F4 PHCs (C34-C50)	6 ug/g	<6	<6	<6	<6	120	ug/g
Semi-Volatiles							
Acenaphthene	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	0.05	ug/g
Acenaphthylene	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	0.093	ug/g
Anthracene	0.02 ug/g	<0.02	<0.02	<0.02	0.04	0.05	ug/g
Benzo [a] anthracene	0.02 ug/g	<0.02	<0.02	<0.02	0.08	0.095	ug/g
Benzo [a] pyrene	0.02 ug/g	<0.02	<0.02	<0.02	0.07	0.05	ug/g
Benzo [b] fluoranthene	0.02 ug/g	<0.02	<0.02	<0.02	0.04	0.3	ug/g
Benzo [g,h,i] perylene	0.02 ug/g	<0.02	<0.02	<0.02	0.07	0.2	ug/g
Benzo [k] fluoranthene	0.02 ug/g	<0.02	<0.02	<0.02	0.03	0.05	ug/g
Chrysene	0.02 ug/g	<0.02	<0.02	<0.02	0.06	0.18	ug/g
Dibenzo [a,h] anthracene	0.02 ug/g	<0.02	<0.02	<0.02	0.03	0.1	ug/g
Fluoranthene	0.02 ug/g	<0.02	<0.02	<0.02	0.19	0.24	ug/g
Fluorene	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	0.05	ug/g
Indeno [1,2,3-cd] pyrene	0.02 ug/g	<0.02	<0.02	<0.02	0.10	0.11	ug/g
1-Methylnaphthalene	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	0.05	ug/g

Certificate of Analysis

Report Date: 28-Oct-2021

Client: **Golder Associates Ltd. (Windsor)**

Order Date: 6-Oct-2021

Client PO:

Project Description: 21482896

	Client ID:	BH102B-3	BH101-3	BH101-4	BH102B-2A		
	Sample Date:	04-Oct-2021	04-Oct-2021	04-Oct-2021	04-Oct-2021	**Criteria:**	
	Sample ID:	2141425-05	2141425-07	2141425-08	2141425-11	**Reg 153/04 (2011)-Table 1 Agricultural**	
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
2-Methylnaphthalene	0.02 ug/g	<0.02	<0.02	<0.02	<0.02	0.05	ug/g
Methylnaphthalene (1&2)	0.03 ug/g	<0.03	<0.03	<0.03	0.03	0.05	ug/g
Naphthalene	0.01 ug/g	<0.01	<0.01	<0.01	0.03	0.05	ug/g
Phenanthrene	0.02 ug/g	<0.02	<0.02	<0.02	0.13	0.19	ug/g
Pyrene	0.02 ug/g	<0.02	<0.02	<0.02	0.13	0.19	ug/g
2-Fluorobiphenyl	Surrogate	99.6%	69.3%	84.2%	71.0%		
Terphenyl-d14	Surrogate	104%	83.1%	82.9%	83.0%		

Certificate of Analysis

Client: Golder Associates Ltd. (Windsor)

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

						Criteria:	
Client ID:		BH102B-2B	-	-	-	Reg 153/04 (2011)-Table 1 Agricultural	
Sample Date:		04-Oct-2021	-	-	-		
Sample ID:		2141425-12	-	-	-		
Matrix:		Soil	-	-	-		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	85.4	-	-	-		
General Inorganics							
SAR	0.01 N/A	0.78	-	-	-	1	N/A
Conductivity	5 uS/cm	211	-	-	-	0.47	mS/cm
Cyanide, free	0.03 ug/g	<0.03	-	-	-	0.051	ug/g
pH	0.05 pH Units	7.48	-	-	-	5 - 9	pH units
Metals							
Antimony	1.0 ug/g	<1.0	-	-	-	1	ug/g
Arsenic	1.0 ug/g	5.4	-	-	-	11	ug/g
Barium	1.0 ug/g	67.7	-	-	-	210	ug/g
Beryllium	0.5 ug/g	0.6	-	-	-	2.5	ug/g
Boron	5.0 ug/g	17.1	-	-	-	36	ug/g
Boron, available	0.5 ug/g	<0.5	-	-	-		
Cadmium	0.5 ug/g	<0.5	-	-	-	1	ug/g
Chromium	5.0 ug/g	18.6	-	-	-	67	ug/g
Chromium (VI)	0.2 ug/g	<0.2	-	-	-	0.66	ug/g
Cobalt	1.0 ug/g	7.8	-	-	-	19	ug/g
Copper	5.0 ug/g	16.8	-	-	-	62	ug/g
Lead	1.0 ug/g	8.6	-	-	-	45	ug/g
Mercury	0.1 ug/g	<0.1	-	-	-	0.16	ug/g
Molybdenum	1.0 ug/g	1.9	-	-	-	2	ug/g
Nickel	5.0 ug/g	22.9	-	-	-	37	ug/g
Selenium	1.0 ug/g	<1.0	-	-	-	1.2	ug/g

PARACEL
LABORATORIES LTD.

Order #: 2141425

Certificate of Analysis

Client: **Golder Associates Ltd. (Windsor)**

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

	Client ID:	BH102B-2B	-	-	-	**Criteria:**	
	Sample Date:	04-Oct-2021	-	-	-	**Reg 153/04 (2011)-Table 1 Agricultural**	
	Sample ID:	2141425-12	-	-	-		
	Matrix:	Soil	-	-	-		
	MDL/Units						
Silver	0.3 ug/g	<0.3	-	-	-	0.5	ug/g
Thallium	1.0 ug/g	<1.0	-	-	-	1	ug/g
Uranium	1.0 ug/g	1.2	-	-	-	1.9	ug/g
Vanadium	10.0 ug/g	32.1	-	-	-	86	ug/g
Zinc	20.0 ug/g	58.3	-	-	-	290	ug/g
Hydrocarbons							
F2 PHCs (C10-C16)	4 ug/g	<4	-	-	-	10	ug/g
F3 PHCs (C16-C34)	8 ug/g	<8	-	-	-	240	ug/g
F4 PHCs (C34-C50)	6 ug/g	<6	-	-	-	120	ug/g
Semi-Volatiles							
Acenaphthene	0.02 ug/g	<0.02	-	-	-	0.05	ug/g
Acenaphthylene	0.02 ug/g	<0.02	-	-	-	0.093	ug/g
Anthracene	0.02 ug/g	<0.02	-	-	-	0.05	ug/g
Benzo [a] anthracene	0.02 ug/g	<0.02	-	-	-	0.095	ug/g
Benzo [a] pyrene	0.02 ug/g	<0.02	-	-	-	0.05	ug/g
Benzo [b] fluoranthene	0.02 ug/g	<0.02	-	-	-	0.3	ug/g
Benzo [g,h,i] perylene	0.02 ug/g	<0.02	-	-	-	0.2	ug/g
Benzo [k] fluoranthene	0.02 ug/g	<0.02	-	-	-	0.05	ug/g
Chrysene	0.02 ug/g	<0.02	-	-	-	0.18	ug/g
Dibenzo [a,h] anthracene	0.02 ug/g	<0.02	-	-	-	0.1	ug/g
Fluoranthene	0.02 ug/g	<0.02	-	-	-	0.24	ug/g
Fluorene	0.02 ug/g	<0.02	-	-	-	0.05	ug/g
Indeno [1,2,3-cd] pyrene	0.02 ug/g	<0.02	-	-	-	0.11	ug/g
1-Methylnaphthalene	0.02 ug/g	<0.02	-	-	-	0.05	ug/g

Certificate of Analysis

Client: Golder Associates Ltd. (Windsor)

Client PO:

Report Date: 28-Oct-2021

Order Date: 6-Oct-2021

Project Description: 21482896

	Client ID:	BH102B-2B	-	-	-	**Criteria:**
	Sample Date:	04-Oct-2021	-	-	-	**Reg 153/04 (2011)-Table 1 Agricultural**
	Sample ID:	2141425-12	-	-	-	
	Matrix:	Soil	-	-	-	
	MDL/Units					
2-Methylnaphthalene	0.02 ug/g	<0.02	-	-	-	0.05 ug/g
Methylnaphthalene (1&2)	0.03 ug/g	<0.03	-	-	-	0.05 ug/g
Naphthalene	0.01 ug/g	<0.01	-	-	-	0.05 ug/g
Phenanthrene	0.02 ug/g	<0.02	-	-	-	0.19 ug/g
Pyrene	0.02 ug/g	<0.02	-	-	-	0.19 ug/g
2-Fluorobiphenyl	Surrogate	74.7%	-	-	-	
Terphenyl-d14	Surrogate	87.1%	-	-	-	

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						
Cyanide, free	ND	0.03	ug/g						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.03	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*0.165*		*ug/g*		*82.8*	*50-140*			
Surrogate: Terphenyl-d14	*0.217*		*ug/g*		*108*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane, 1,2-	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*7.63*		*ug/g*		*95.4*	*50-140*			
Surrogate: Dibromofluoromethane	*7.40*		*ug/g*		*92.4*	*50-140*			
Surrogate: Toluene-d8	*7.96*		*ug/g*		*99.5*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	3.47	0.01	N/A	3.61			4.0	30	
Conductivity	537	5	uS/cm	536			0.2	5	
Cyanide, free	ND	0.03	ug/g	ND			NC	35	
pH	7.48	0.05	pH Units	7.45			0.4	10	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g	ND			NC	30	
Metals									
Antimony	ND	1.0	ug/g	ND			NC	30	
Arsenic	8.6	1.0	ug/g	8.0			7.4	30	
Barium	85.4	1.0	ug/g	80.8			5.5	30	
Beryllium	0.7	0.5	ug/g	0.6			12.8	30	
Boron, available	0.96	0.5	ug/g	0.82			16.1	35	
Boron	6.7	5.0	ug/g	ND			NC	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	19.9	5.0	ug/g	18.9			5.3	30	
Cobalt	8.2	1.0	ug/g	7.6			7.7	30	
Copper	21.3	5.0	ug/g	19.3			9.6	30	
Lead	18.2	1.0	ug/g	16.8			7.8	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	ND	1.0	ug/g	ND			NC	30	
Nickel	22.4	5.0	ug/g	20.8			7.5	30	
Selenium	ND	1.0	ug/g	ND			NC	30	
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	ND	1.0	ug/g	ND			NC	30	
Vanadium	29.4	10.0	ug/g	28.3			3.8	30	
Zinc	60.2	20.0	ug/g	55.4			8.3	30	
Physical Characteristics									
% Solids	91.2	0.1	% by Wt.	90.5			0.7	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g	ND			NC	40	
Anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g	ND			NC	40	

PARACEL
LABORATORIES LTD.

Order #: 2141425

Certificate of Analysis
Client: Golder Associates Ltd. (Windsor)
Client PO:

Report Date: 28-Oct-2021
Order Date: 6-Oct-2021
Project Description: 21482896

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [a] pyrene	ND	0.02	ug/g	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g	ND			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Chrysene	ND	0.02	ug/g	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g	ND			NC	40	
Fluoranthene	ND	0.02	ug/g	ND			NC	40	
Fluorene	ND	0.02	ug/g	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
Naphthalene	ND	0.01	ug/g	ND			NC	40	
Phenanthrene	ND	0.02	ug/g	ND			NC	40	
Pyrene	ND	0.02	ug/g	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	*0.184*		ug/g		*87.4*	*50-140*			
Surrogate: Terphenyl-d14	*0.223*		ug/g		*106*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g	ND			NC	50	
Benzene	ND	0.02	ug/g	ND			NC	50	
Bromodichloromethane	ND	0.05	ug/g	ND			NC	50	
Bromoform	ND	0.05	ug/g	ND			NC	50	
Bromomethane	ND	0.05	ug/g	ND			NC	50	
Carbon Tetrachloride	ND	0.05	ug/g	ND			NC	50	
Chlorobenzene	ND	0.05	ug/g	ND			NC	50	
Chloroform	ND	0.05	ug/g	ND			NC	50	
Dibromochloromethane	ND	0.05	ug/g	ND			NC	50	
Dichlorodifluoromethane	ND	0.05	ug/g	ND			NC	50	
1,2-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,3-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,4-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,1-Dichloroethane	ND	0.05	ug/g	ND			NC	50	
1,2-Dichloroethane	ND	0.05	ug/g	ND			NC	50	
1,1-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
1,2-Dichloropropane	ND	0.05	ug/g	ND			NC	50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g	ND			NC	50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Ethylene dibromide (dibromoethane, 1,2-	ND	0.05	ug/g	ND			NC	50	
Hexane	ND	0.05	ug/g	ND			NC	50	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g	ND			NC	50	
Methyl Isobutyl Ketone	ND	0.50	ug/g	ND			NC	50	
Methyl tert-butyl ether	ND	0.05	ug/g	ND			NC	50	
Methylene Chloride	ND	0.05	ug/g	ND			NC	50	
Styrene	ND	0.05	ug/g	ND			NC	50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g	ND			NC	50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g	ND			NC	50	
Tetrachloroethylene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
1,1,1-Trichloroethane	ND	0.05	ug/g	ND			NC	50	
1,1,2-Trichloroethane	ND	0.05	ug/g	ND			NC	50	
Trichloroethylene	ND	0.05	ug/g	ND			NC	50	
Trichlorofluoromethane	ND	0.05	ug/g	ND			NC	50	
Vinyl chloride	ND	0.02	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: 4-Bromofluorobenzene	*10.4*		ug/g		*96.6*	*50-140*			
Surrogate: Dibromofluoromethane	*9.24*		ug/g		*85.9*	*50-140*			
Surrogate: Toluene-d8	*10.8*		ug/g		*100*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Cyanide, free	0.239	0.03	ug/g	ND	70.7	70-130			
Hydrocarbons									
F1 PHCs (C6-C10)	67	7	ug/g	ND	95.1	80-120			
F2 PHCs (C10-C16)	84	4	ug/g	ND	95.9	60-140			
F3 PHCs (C16-C34)	172	8	ug/g	ND	88.1	60-140			
F4 PHCs (C34-C50)	112	6	ug/g	ND	79.1	60-140			
Metals									
Antimony	132	1.0	ug/g	ND	106	70-130			
Arsenic	141	1.0	ug/g	8.0	106	70-130			
Barium	210	1.0	ug/g	80.8	103	70-130			
Beryllium	131	0.5	ug/g	0.6	105	70-130			
Boron, available	4.50	0.5	ug/g	ND	90.0	70-122			
Boron	140	5.0	ug/g	ND	112	70-130			
Cadmium	123	0.5	ug/g	ND	98.2	70-130			
Chromium (VI)	4.2	0.2	ug/g	ND	72.5	70-130			
Chromium	148	5.0	ug/g	18.9	103	70-130			
Cobalt	135	1.0	ug/g	7.6	102	70-130			
Copper	149	5.0	ug/g	19.3	104	70-130			
Lead	133	1.0	ug/g	16.8	93.3	70-130			
Mercury	1.61	0.1	ug/g	ND	107	70-130			
Molybdenum	131	1.0	ug/g	ND	105	70-130			
Nickel	150	5.0	ug/g	20.8	103	70-130			
Selenium	134	1.0	ug/g	ND	107	70-130			
Silver	120	0.3	ug/g	ND	96.0	70-130			
Thallium	118	1.0	ug/g	ND	94.2	70-130			
Uranium	119	1.0	ug/g	ND	95.4	70-130			
Vanadium	160	10.0	ug/g	28.3	105	70-130			
Zinc	185	20.0	ug/g	55.4	103	70-130			
Semi-Volatiles									
Acenaphthene	0.110	0.02	ug/g	ND	104	50-140			
Acenaphthylene	0.101	0.02	ug/g	ND	95.3	50-140			
Anthracene	0.112	0.02	ug/g	ND	106	50-140			
Benzo [a] anthracene	0.107	0.02	ug/g	ND	101	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [a] pyrene	0.131	0.02	ug/g	ND	124	50-140			
Benzo [b] fluoranthene	0.126	0.02	ug/g	ND	119	50-140			
Benzo [g,h,i] perylene	0.130	0.02	ug/g	ND	123	50-140			
Benzo [k] fluoranthene	0.126	0.02	ug/g	ND	120	50-140			
Chrysene	0.118	0.02	ug/g	ND	112	50-140			
Dibenzo [a,h] anthracene	0.115	0.02	ug/g	ND	109	50-140			
Fluoranthene	0.144	0.02	ug/g	ND	136	50-140			
Fluorene	0.123	0.02	ug/g	ND	116	50-140			
Indeno [1,2,3-cd] pyrene	0.126	0.02	ug/g	ND	119	50-140			
1-Methylnaphthalene	0.111	0.02	ug/g	ND	105	50-140			
2-Methylnaphthalene	0.106	0.02	ug/g	ND	100	50-140			
Naphthalene	0.097	0.01	ug/g	ND	92.3	50-140			
Phenanthrene	0.124	0.02	ug/g	ND	118	50-140			
Pyrene	0.114	0.02	ug/g	ND	108	50-140			
Surrogate: 2-Fluorobiphenyl	*0.201*		*ug/g*		*95.7*	*50-140*			
Surrogate: Terphenyl-d14	*0.217*		*ug/g*		*103*	*50-140*			
Volatiles									
Acetone	19.2	0.50	ug/g	ND	98.5	50-140			
Benzene	8.14	0.02	ug/g	ND	101	60-130			
Bromodichloromethane	7.69	0.05	ug/g	ND	95.6	60-130			
Bromoform	7.33	0.05	ug/g	ND	91.2	60-130			
Bromomethane	7.60	0.05	ug/g	ND	95.0	50-140			
Carbon Tetrachloride	7.31	0.05	ug/g	ND	91.4	60-130			
Chlorobenzene	7.73	0.05	ug/g	ND	96.1	60-130			
Chloroform	8.03	0.05	ug/g	ND	99.9	60-130			
Dibromochloromethane	7.21	0.05	ug/g	ND	90.2	60-130			
Dichlorodifluoromethane	8.73	0.05	ug/g	ND	109	50-140			
1,2-Dichlorobenzene	7.48	0.05	ug/g	ND	93.5	60-130			
1,3-Dichlorobenzene	7.48	0.05	ug/g	ND	93.6	60-130			
1,4-Dichlorobenzene	7.31	0.05	ug/g	ND	90.9	60-130			
1,1-Dichloroethane	7.86	0.05	ug/g	ND	98.2	60-130			
1,2-Dichloroethane	8.47	0.05	ug/g	ND	105	60-130			
1,1-Dichloroethylene	7.25	0.05	ug/g	ND	90.6	60-130			
cis-1,2-Dichloroethylene	7.46	0.05	ug/g	ND	92.7	60-130			
trans-1,2-Dichloroethylene	7.51	0.05	ug/g	ND	93.4	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,2-Dichloropropane	7.96	0.05	ug/g	ND	99.5	60-130			
cis-1,3-Dichloropropylene	7.11	0.05	ug/g	ND	88.8	60-130			
trans-1,3-Dichloropropylene	7.07	0.05	ug/g	ND	87.9	60-130			
Ethylbenzene	7.85	0.05	ug/g	ND	97.7	60-130			
Ethylene dibromide (dibromoethane, 1,2-	7.63	0.05	ug/g	ND	94.9	60-130			
Hexane	7.27	0.05	ug/g	ND	90.8	60-130			
Methyl Ethyl Ketone (2-Butanone)	19.3	0.50	ug/g	ND	94.2	50-140			
Methyl Isobutyl Ketone	20.3	0.50	ug/g	ND	104	50-140			
Methyl tert-butyl ether	20.2	0.05	ug/g	ND	101	50-140			
Methylene Chloride	8.21	0.05	ug/g	ND	102	60-130			
Styrene	7.91	0.05	ug/g	ND	97.8	60-130			
1,1,1,2-Tetrachloroethane	7.61	0.05	ug/g	ND	95.1	60-130			
1,1,2,2-Tetrachloroethane	7.81	0.05	ug/g	ND	97.1	60-130			
Tetrachloroethylene	7.45	0.05	ug/g	ND	92.7	60-130			
Toluene	8.05	0.05	ug/g	ND	101	60-130			
1,1,1-Trichloroethane	7.42	0.05	ug/g	ND	92.8	60-130			
1,1,2-Trichloroethane	7.99	0.05	ug/g	ND	99.3	60-130			
Trichloroethylene	7.95	0.05	ug/g	ND	98.8	60-130			
Trichlorofluoromethane	7.48	0.05	ug/g	ND	93.5	50-140			
Vinyl chloride	7.87	0.02	ug/g	ND	98.4	50-140			
m,p-Xylenes	15.5	0.05	ug/g	ND	96.4	60-130			
o-Xylene	7.73	0.05	ug/g	ND	96.1	60-130			
Surrogate: 4-Bromofluorobenzene	*16.5*		*ug/g*		*103*	*50-140*			
Surrogate: Dibromofluoromethane	*18.5*		*ug/g*		*116*	*50-140*			
Surrogate: Toluene-d8	*16.0*		*ug/g*		*100*	*50-140*			

PARACEL LABORATORIES LTD.

Order #: 2141425

Certificate of Analysis

Report Date: 28-Oct-2021

Client: Golder Associates Ltd. (Windsor)

Order Date: 6-Oct-2021

Client PO:

Project Description: 21482896

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision 1 - This report contains additional data

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Soil/Solid results are reported on a dry weight basis unless otherwise indicated
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

PARACEL LABORATORIES LTD.

Paracel ID: 2141425

Paracel Order Number (Lab Use Only): 2141425

Chain Of Custody (Lab Use Only) № 62407

Client Name: Golder Associates Ltd.	Project Ref: 21482896	Page 1 of 2	
Contact Name: Atefeh Mehdilou / Peter Giuliani	Quote #: 21 - 463	Turnaround Time	
Address: 1825 Provincial Rd.	PO #:	☐ 1 day	☐ 3 day
	E-mail: atefeh_mehdilou@golder.com	☐ 2 day	☑ Regular
Telephone: (226) 757-3408		Date Required:	

☐ REG 153/04 ☒ REG 406/19 — ☐ Table 1 ☐ Res/Park ☐ Med/Fine; ☐ Table 2 ☐ Ind/Comm ☐ Coarse; ☐ Table 3 ☐ Agri/Other; ☐ Table ___; For RSC: ☐ Yes ☐ No

Other Regulation — ☐ REG 558 ☐ PWQO; ☐ CCME ☐ MISA; ☐ SU - Sani ☐ SU - Storm; Mun: ___; ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis

#	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHC+VOC	M+I	PAH	HOLD
1	BH101-2				Oct. 4/21		✓	✓	✓	
2	BH101-2-DUP						✓	✓	✓	
3	BH101-5						✓	✓	✓	
4	BH 102B-1						✓	✓	✓	
5	BH102B-3						✓	✓	✓	
6	BH 101-1									✓
7	BH 101-3									✓
8	BH 101-4									✓
9	BH102A-1									✓
10	BH 102A-2									✓

Comments:

Method of Delivery: Walk in

Relinquished By (Sign): At	Received By Driver/Depot: K. Jakobsen	Received at Lab: AM	Verified By: K. Jakobsen
Relinquished By (Print): Atefeh MehdiLou	Date/Time: Oct. 6/21 15:50	Date/Time: 8/10/21 9:48	Date/Time: Oct. 7/21 13:45
Date/Time: Oct 6/21 - 15:50	Temperature: 9.9 °C	Temperature: 2.3 °C	pH Verified: ☐ By:

Paracel ID: 2141425

PARACEL LABORATORIES LTD.

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2141425	№ 62408

Client Name: Golder Associates Ltd.	Project Ref: 21482896		Page 2 of 2
Contact Name: Atefeh Mehdilou / Peter Giulian:	Quote #:		Turnaround Time
Address: 1825 Provincial Rd.	PO #:		☐ 1 day ☐ 3 day
	E-mail: atefeh_mehdilou@golder.com		☐ 2 day ☑ Regular
Telephone: (226) 757-3408			Date Required:

☐ REG 153/04 ☑ REG 406/19 | Other Regulation

☐ Table 1 ☐ Res/Park ☐ Med/Fine | ☐ REG 558 ☐ PWQO

☐ Table 2 ☐ Ind/Comm ☐ Coarse | ☐ CCME ☐ MISA

☐ Table 3 ☐ Agri/Other | ☐ SU - Sani ☐ SU - Storm

☐ Table | Mun:

For RSC: ☐ Yes ☐ No | ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHC+VOC	M+I	PAH									HOLD
1	BH102B-2A																	✓
2	BH102B-2B																	✓
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments:

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Relinquished By (Sign):	Received by Driver/Depot: K. Jakobsen	Received at Lab:	Verified By:
Relinquished By (Print): Atefeh Mehdilou	Date/Time: Oct. 6/21 15:50	Date/Time: 8/10/21 9:45	Date/Time:
Date/Time: Oct 6/21 - 15:50	Temperature: 9.9 °C	Temperature: 2.3 °C	pH Verified: ☐ By:

Chain of Custody (Blank) xlsx

Revision 4.0

APPENDIX D

Stage 2 Archaeological Assessment Report

Stage 2 Archaeological Assessment: St. Rose Pumping Station Municipal Class Environmental Assessment

Part of Lots 122 and 123, Concession 1 Petite Côte, Geographic Township of Sandwich East, former County of Essex, now City of Windsor, Ontario

July 6, 2022

Prepared for:

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Project Information Form Number: P256-0697-2021

Project Number: 165620239

ORIGINAL REPORT

Executive Summary

Stantec Consulting Ltd. (Stantec) was retained by the City of Windsor (the City) to complete Stage 2 archaeological assessment for the area to be impacted by the proposed St. Rose Pumping Station (the Project) which forms part of the City's Sewer Master Plan. The Stage 2 archaeological assessment was undertaken by Stantec, on behalf of the City, in the preliminary planning and design process as part of the Municipal Class Environmental Assessment (Class EA) for the Project under the Ontario *Environmental Assessment Act* (Government of Ontario 1990a). The study area for the Project is approximately 0.7 hectares and comprises part of Lots 122 and 123, Concession 1 Petite Côte, Geographic Township of Sandwich East, former Essex County, now City of Windsor, Ontario.

The Stage 2 archaeological assessment was completed under Project Information Form number P256-0697-2021 issued to Parker Dickson, MA, of Stantec, by the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI). The Stage 1 archaeological assessment by Fisher Archaeological Consulting (FAC) determined that portions of the study area retained potential for the identification and recovery of archaeological resources and Stage 2 archaeological assessment was recommended (FAC 2020). The Stage 2 archaeological assessment was conducted by Stantec on October 1, 2021.

No archaeological resources were identified during the Stage 2 archaeological assessment of the study area. Thus, in accordance with Section 2.2 and Section 7.8.4 of the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **no further land-based archaeological assessment of the study area is required**.

The portion of the study area containing the Detroit River retains potential for the identification of marine archaeological resources (FAC 2020; see Figure 11). The in-water portion of the study area requires marine archaeological assessment as recommended by the Stage 1 assessment of the study area for the Project (FAC 2020). Thus, further archaeological assessment of the marine portion of the study area is required. As portions of the St. Rose PS study area overlap the Detroit River, Project components and anticipated construction may impact the riverbed. These activities have the potential to impact submerged cultural resources. **Stantec recommends that a Marine Archaeological Overview Assessment (MAOA) be completed for the portion of the study area which includes the Detroit River**.

Full and detailed recommendations are provided in the body of the report.

The MHSTCI is asked to review the results presented and to accept this report into the *Ontario Public Register of Archaeological Reports*. Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the *Ontario Heritage Act* (Government of Ontario 1990b) and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

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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1.0 PROJECT CONTEXT

Stantec Consulting Ltd. (Stantec) was retained by the City of Windsor (the City) to complete Stage 2 archaeological assessment for the area to be impacted by the proposed St. Rose Pumping Station (the Project) which forms part of the City's Sewer Master Plan. The Stage 2 archaeological assessment was undertaken by Stantec, on behalf of the City, in the preliminary planning and design process as part of the Municipal Class Environmental Assessment (Class EA) for the Project under the Ontario *Environmental Assessment Act* (Government of Ontario 1990a).

The study area for the Project comprises approximately 0.7 hectares and is located on part of Lots 122 and 123, Concession 1 Petite Côte, Geographic Township of Sandwich East, former Essex County, now City of Windsor, Ontario. The municipal address of the study area is 6902 Riverside Drive East, Windsor, Ontario (Figures 1 and 2). A Stage 1 archaeological assessment of the study area by Fisher Archaeological Consulting (FAC) in 2020 recommended Stage 2 archaeological assessment for a portion of the study area (FAC 2020). Additional information related to the previous archaeological assessment of the study area is provided in Section 1.3.4.

1.1.1 Objectives

The Stage 2 archaeological assessment was completed in compliance with the provincial standards and guidelines set out in the Ministry of Heritage, Sport, Tourism and Culture Industries' (MHSTCI) 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The objectives of the Stage 2 assessment were to document archaeological resources present within the study area, to determine whether any of the resources might be artifacts or archaeological sites with cultural heritage value or interest requiring further assessment, and to provide specific Stage 3 direction for the protection, management and/or recovery of the identified archaeological resources (Government of Ontario 2011).

Permission to enter the study area to conduct the archaeological assessment was provided by the City.

1.2 HISTORICAL CONTEXT

1.2.1 Post-contact Indigenous Resources

"Contact" is typically used as a chronological benchmark when discussing Indigenous archaeology in Canada and describes the contact between Indigenous and European cultures. 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 16^{th} century (Loewen and Chapdelaine 2016).

At the turn of the 16^{th} century, the study area is documented to have been occupied by the Western Basin Tradition archaeological culture (see Section 1.3.2). Following the turn of the 17^{th} century, the region of the study area is understood to have been within the territory of the Fire Nation, an Algonkian group occupying the western end of Lake Erie. It is argued, however, that the Attiwandaron (Neutral) expanded extensively westward, displacing the Fire Nation (Lennox and Fitzgerald 1990: 418-419). 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 oral tradition states that the Three Fires (a political confederacy constituted of the Potawatomi, Ojibwa, and Ottawa) have occupied the delta of the St. Clair River and the surrounding region continually for thousands of years (Walpole Island First Nation [WIFN] n.d.). In 1649, the Seneca, with the Mohawk, led a campaign into southern Ontario and dispersed the resident populations, and the Seneca used the lower Great Lakes basin as a prolific hinterland for beaver hunting (Heidenreich 1978; Trigger 1978:345).

By 1690, Ojibwa-speaking people had begun to displace the Seneca from southern Ontario. 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). 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 (Lytwyn 2009), and the Deshkaan Ziibing Anishnaabeg (Chippewas of the Thames First Nation). Some populations of Wyandot (an Indigenous population of historically amalgamated Petun and Huron-Wendat individuals) 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 Ottawa 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, 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). A 1749 French map of the Detroit River region (Chaussegros de Léry 1752) depicts Ottawa and Huron villages on the waterfront of the Windsor region (Figure 3).

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 still 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).

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

Following the American Revolutionary War, Britain (the Crown) focused on the settlement of European immigrants into what became the province of Upper Canada in 1791. To enable widespread settlement, the Crown negotiated a series of treaties with Indigenous peoples. One of the earliest treaties involving lands located in close proximity to the study area was made on May 19, 1790 (Figure 4). Originally identified as the Detroit Treaty, the chiefs of the Ottawa, Chippewa, Potawatomi, and Huron nations 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, Del[a]ware 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 Blenheim Memorial Park in Blenheim, Ontario reads:

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

(Government of Canada 2010)

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. The study area for the Projet is located near Trail G. Trail G represents an early path along the south shore of Lake St. Clair, connecting the Thames River to Sandwich (now, the City of Windsor). This road was travelled by Governor Simcoe in 1793 (Lajeunesse 1960:xxxix).

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.

1.2.2 Euro-Canadian Resources

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 Detroit River (Fuller 1972:6-8). 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). The street pattern of the City of Windsor still reflects the French method of agricultural land division; for example, the long narrow parcels fronting the river where the “Petite côte” was located (Morrison 1954:3-4). In 1796, the original townsite of Sandwich was established to accommodate new immigrants of both French and British origin from the United States who wished to remain under British rule following American occupation of Detroit. This constituted the first urban settlement in what is now the City of Windsor and the first significant migration of English-speaking people into the Windsor area (Neal 1909:86-87).

Essex County was originally part of the District of Hesse, and in 1792 was renamed the Western District. On January 1, 1800, in the *Act for the Better Division of the Province*, the townships of Rochester, Mersea, Gosfield, Maidstone, Sandwich, and Malden were created as part of the County of Essex. The townships of Essex County were surveyed by Patrick McNiff, Abraham Iredell, and Thomas Smith (Clarke 2010).

As the area began to attract more Euro-Canadian interest, Patrick McNiff was assigned to survey and organize the area into a township, also to be named Sandwich. His survey of the township was completed in 1793. The form of the concessions noted as “Petite côte” were dictated by the land divisions already used by the French farmers in the “Petite côte” area, in what was to become Concession 1 Petite Côte. In fact, on his original township map where he measured the Concession 1 lots, Patrick McNiff notes that “on my measuring the farms in front from No. 1 to No. 154 found their division Lines to run in the very irregular manner they appear on the Plan” (McNiff 1956). The most accurate maps produced of the township at this time was completed by Abraham Iredell between 1797 and 1803, who resurveyed the area and renumbered the lots from Lot 82 onwards in Concessions 1 to 3 Petite Côte (Iredell 1803; Morris 1929). No landowner names are provided for Lots 122 and 123 on Iredell’s 1803 map (Figure 7). Belle Isle, across from the study area within the Detroit River, was originally called “Isle aux Cochons qui sert de Commune” (Hog Island) by the French since the island was common land used for keeping livestock (Figure 7). In 1879, the City of Detroit bought the island from the Campau family and created a park, which eventually became known as Belle Isle (Detroit Historical Society n.d.).

The 1815 Royal Navy survey of the Detroit River by Captain W.F.W. Owen, published in 1828 (Owen 1828), depicts a relatively developed township and illustrates various structures/buildings, windmills, and roads/trails focused along the river's edge (Figure 8). A structure is depicted close to the study area, and a dotted line along the shoreline shows that the water was shallow in this area.

By the mid-1850s, the community of Windsor became more established and grew large enough to compete with the adjacent community of Sandwich for important industrial development. For example, the Great Western Railway chose Windsor over Sandwich as its termination point in 1854. The arrival of the railway also allowed for the foundation of Walkerville, the third oldest settlement that is now part of the City of Windsor. In 1857, Hiram Walker established his distillery in the downtown area of Windsor where the Great Western Railway first met the waterfront (Morrison 1954:26).

In 1858, both Windsor and Sandwich were incorporated as towns (Morrison 1954:42). In 1861, the Township of Sandwich was subdivided into the Townships of Sandwich West, Sandwich East, and Sandwich South (Neal 1909:12). The 1877 *Map of Essex County, Ontario* (Walling 1877) indicates that Hypolite Mailloux owned the portion of Lot 122 within the study area and Leon St. Louis owned the portion of Lot 123 within the study area. No structures are depicted on the 1861 within or adjacent to the study area, but Riverside Drive is depicted along the Detroit River shoreline up to Lot 123, and St. Rose Avenue running south and then east (Figure 9).

The 1881 Essex Supplement in the *Illustrated Atlas of the Dominion of Canada* (Belden & Co. 1881) lists Alex St. Louis as the landowner for Lot 123, and a structure is depicted near the Detroit River shoreline but not within or adjacent to the study area (Figure 10). No landowner is indicated for Lot 122. The Essex County historical atlas of 1881 documents a total population of 36,258 for Essex County at that time (Belden & Co. 1881:8). Of the total population, 25,303 settlers lived in rural settings, while 10,955 lived in urban settings (Belden & Co. 1881:8).

In discussing 18th and 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). Further, review of historical mapping has inherent accuracy difficulties due to potential error in georeferencing. Georeferencing 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 the historical cartography, historical maps may not translate accurately into real space points. This may provide obvious inconsistencies during historical map review.

1.3 ARCHAEOLOGICAL CONTEXT

1.3.1 The Natural Environment

The study area is situated in the St. Clair Clay Plains physiographic region, as identified by Chapman and Putnam (1984). This region is described as:

> *Adjoining Lake St. Clair in Essex and Kent County 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 500 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)

Original soils in the study area along the Detroit River shoreline are classified as Brookston Clay (Richards *et al.* 1949). Although these soils may have been suitable for Indigenous or Euro-Canadian agriculture, their proximity to the river would have resulted in potential flooding. The majority of the study area is composed of fill deposited between 1975 and 2000 to create and extend land north of the original shore, into the river (FAC 2020).

The closest potable water source is the Detroit River which forms the north part of the study area. The remainder of the study area is located on the south shoreline of the Detroit River. Use of the Detroit River has evolved over time from being a transportation route used by early Indigenous inhabitants and Euro-Canadian explorers and settlers, to an industrial power source to support the early mills of the area, to a commercial shipping route, and finally to a water course used for recreational purposes throughout the 20th and 21st centuries.

1.3.2 Pre-contact Indigenous Resources

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

Period	Characteristics	Time Period	Comments
Early Paleo-Indian	Fluted Projectiles	9000 – 8400 BCE	spruce parkland/caribou hunters
Late Paleo-Indian	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 Point	2500 – 1800 BCE	increasing site size
	Broad Point	1800 – 1500 BCE	large chipped lithic tools
	Small Point	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	Couture Corded Pottery	400 BCE – 500 CE	increased sedentism
	Riviere au Vase Phase	500 – 800 CE	seasonal hunting and gathering
Late Woodland	Younge Phase	800 – 1200 CE	incipient agriculture
	Springwells Phase	1200 – 1400 CE	agricultural villages
	Wolf Phase	1400 – 1550 CE	earth worked villages, warfare
Contact Indigenous	Various Algonkian and Iroquoian Groups	1600 – 1875 CE	early written records and treaties
Historical	French/Euro-Canadian	1749 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 in particular 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. Since 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 (naturally occurring pure copper metal) (Ellis 2013:42). The known 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). This change in geography coincides with the earliest evidence for cemeteries (Ellis 2013:46). By 2500 BCE, the earliest evidence exists for the construction of fishing weirs (Ellis *et al*. 1990: Figure 4.1). 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 approximately 550 CE, evidence emergences for the introduction of maize into southern Ontario. This crop would have initially only supplemented the Indigenous 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 through 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 cultural affiliation of populations within the region of the study area at this time period is debated, whether they may have spoken a form of Iroquoian language or Algonquian (Murphy and Ferris 1990). The extant archaeological record demonstrates many cultural traits similar to historical Indigenous nations (Williamson 2013:55).

By the Late Woodland period there was a distinctive cultural occupation in southwestern Ontario, including Essex, Kent, and Lambton counties. The primary Late Woodland occupants of the Windsor area were populations described by archaeologists as belonging to the 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 centered 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 into four phases based on differences in settlement and subsistence strategies and pottery attributes. By the time of increased European interaction in the last half of the 16th century and early 17th century, there were no Western Basin Tradition sites in the Essex County area, having moved west into Michigan (Ferris 2009:32-33).

1.3.3 Registered Archaeological Sites and Surveys

In Canada, archaeological sites are registered within the Borden system, a national grid system designed by Charles Borden in 1952 (Borden 1952). The grid covers the entire surface area of Canada and is divided into major units containing an area that is two degrees in latitude by four degrees in longitude. Major units are designated by upper case letters. Each major unit is subdivided into 288 basic unit areas, each containing an area of 10 minutes in latitude by 10 minutes in longitude. The width of basic units reduces as one moves north due to the curvature of the earth. In southern Ontario, each basic unit measures approximately 13.5 kilometres east-west by 18.5 kilometres north-south. In northern Ontario, adjacent to Hudson Bay, each basic unit measures approximately 10.2 kilometres east-west by 18.5 kilometres north-south. Basic units are designated by lower case letters. Individual sites are assigned a unique, sequential number as they are registered. These sequential numbers are issued by the MHSTCI who maintain the *Ontario Archaeological Sites Database*. The study area under review straddles the boundary of two Borden Block designations: AbHr and AcHr.

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 1990b). 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 MHSTCI 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 no registered archaeological sites located within a one-kilometre radius of the study area (Government Ontario 2021a). A query of the *Ontario Public Register of Archaeological Reports* (Government of Ontario 2021b) identified two archaeological assessments within 50 metres of the study area (Table 2).

Table 2: Previous Archaeological Assessment Reports

Consultant	Report Title	Project Information Form (PIF) Number	Year
Mayer Heritage Consultants Inc.	*Archaeological Assessment (Stage 1), Proposed Vista Improvement, Riverside Drive East and West, City of Windsor, County of Essex, Ontario*	P040-092	2005
Fisher Archaeological Consulting	*City of Windsor Sewer Master Plan, Type 2, City of Windsor: Archaeological Stage 1: Background Study in the Geographic Township of Sandwich, Essex County, Ontario*	P359-0117-2019	2020

In 2005, Mayer Heritage Consultants Inc. (MHCI) conducted a Stage 1 assessment along Riverside Drive from Rosedale Avenue to the eastern boundary of the City of Windsor (MHCI 2005). MHCI (2005) determined that the road corridor was disturbed and had no archaeological potential, but that adjacent parks retained archaeological potential.

In 2020, FAC conducted a Stage 1 archaeological assessment for the Windsor Sewer Master Plan, which included the St. Rose Pump Station (PS) study area (FAC 2020). This report is described in more detail in Section 1.3.4.

1.3.4 Previous Archaeological Investigations

The proposed St. Rose PS forms part of the Windsor Sewer Master Plan. A Stage 1 archaeological assessment for the Windsor Sewer Master Plan was conducted in 2020 by FAC. FAC (2020) determined that the majority of the St. Rose PS study area is situated on land artificially created between 1975 and 2000 by infilling along the south shore of the Detroit River, and therefore retains no to low archaeological potential. However, FAC (2020) determined that a portion of the St. Rose PS study area, between an existing disturbed and artificial berm and the northern edge of Riverside Drive, may represent the original shoreline of the Detroit River and retains archaeological potential. FAC (2020) also noted that the St. Rose PS property is located within 100 metres of pre-1800 Euro-Canadian settlement and adjacent to a historical road. FAC (2020) recommended Stage 2 archaeological assessment be undertaken on the south portion of the St. Rose PS study area prior to any construction impacts. In addition, FAC (2020) recommended that a marine archaeology assessment be undertaken for the portion of the study area extending into the Detroit River.

1.4 EXISTING CONDITIONS

The study area for the Stage 2 assessment of the Project is approximately 0.7 hectares and is located on part of Lots 122 and 123, Concession 1 Petite Côte, Geographic Township of Sandwich East, former Essex County, now City of Windsor, Ontario. The study area is located on the south shore of the Detroit River, north of Riverside Drive. The study area contains a portion of the river and a municipal park with manicured lawn and paved sidewalks. Most of the park was artificially created in the late 20th century by filling in the river shoreline (FAC 2020). The original river shoreline is marked by an extensively disturbed and artificial berm which crosses the study area, which is the southern border of the fill.

2.0 FIELD METHODS

Stage 2 archaeological assessment of the study area was conducted on October 1, 2021, under PIF number P256-0697-2021 issued to Parker Dickson, MA of Stantec by the MHSTCI. Overall, the study area is approximately 0.7 hectares and comprises part of Lots 122 and 123, Concession 1 Petite Côte, Geographic Township of Sandwich East, former Essex County, now City of Windsor, Ontario. Prior to the start of the Stage 2 archaeological assessment, the study area mapping from the Stage 1 archaeological assessment (FAC 2020) was geo-referenced by Stantec's Geographical Information Services (GIS) team and a digital file (i.e., a shape file) was created of the study area. The digital file was uploaded to handheld Global Positioning Service (GPS) devices for use in the field.

During the Stage 2 survey, assessment conditions were adequate and at no time was the archaeological assessment conducted when the field, weather, or lighting conditions were detrimental to the identification and recovery of archaeological resources (Table 3). Photographic documentation in Section 8.1 of this report confirms that field conditions met the requirements for a Stage 1-2 archaeological assessment, as per the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* (Section 7.8.6 Standard 1a; Government of Ontario 2011). An overview of the Stage 2 assessment methodology, as well as photograph locations and directions, is depicted on Figure 11 in Section 9.0 of this report.

Table 3: Weather and Ground Conditions

Date	Field Director	Weather	Comment
October 1, 2021	Darren Kipping (P422)	Sunny, warm	Soil is dry to slightly damp and friable; screens well

Approximately 13.5% of the study area comprises manicured lawn that was inaccessible for ploughing. This area was subject to test pit survey in accordance with Section 2.1.2 of the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The excavated test pits were at least 30 centimetres in diameter and excavated five centimetres into sterile subsoil. The soils were examined for stratigraphy, cultural features, or evidence of fill. The soil was screened through six-millimetre mesh hardware cloth to facilitate the recovery of small artifacts and then used to backfill the pit. No archaeological resources were recovered during the test pit survey of the study area and so no further test pit methodology was required. Photographs illustrating the test pit survey of the study area are provided in Section 8.2 accordance with Section 7.8.6 Standard 1b of the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

Approximately 40.9% of the study area was previously assessed by FAC (2020) as disturbed. This portion of the study area was not subject to Stage 2 archaeological assessment.

Approximately 45.6% of the study area is located in the Detroit River. As it relates to the land-based archaeological assessment, this area is low and permanently wet and retains low to no archaeological potential (FAC 2020) and was not subject to Stage 2 archaeological assessment. However, FAC (2020) recommended marine archaeology assessment for the portion of the study area within the Detroit River.

3.0 RECORD OF FINDS

The Stage 2 archaeological assessment was conducted employing the methods described in Section 2.0. An inventory of the documentary record generated by fieldwork is provided in Table 3.

Table 4: Inventory of Documentary Record

Document Type	Current Location of Document Type	Additional Comments
1 page of field notes	Stantec office, London, Ontario	In original field book and digitized on server
1 digital map	Stantec office, London, Ontario	Stored digitally in the cloud
1 map provided by the City	Stantec office, London, Ontario	Hard and digital copies in project file
16 digital photographs	Stantec office, London, Ontario	Stored digitally in project file

No archaeological resources were identified within the study area and so no material culture was collected. As a result, no artifact storage arrangements were required.

4.0 ANALYSIS AND CONCLUSIONS

Stantec was retained by the City to conduct Stage 2 archaeological assessment of the study area associated with the Project. The previous Stage 1 archaeological assessment determined that portions of the study area retained potential for the identification and recovery of archaeological resources and Stage 2 archaeological assessment was required (FAC 2020). The Stage 2 archaeological assessment was conducted on October 1, 2021. No archaeological resources were identified during the Stage 2 survey.

In addition to the above, while the Detroit River represents a low and permanently wet area and retains low to no potential for land-based archaeological resources, it may retain potential for the identification of marine archaeological resources. FAC (2020) recommended that a marine archaeology assessment be undertaken for the portion of the study area extending into the Detroit River.

5.0 RECOMMENDATIONS

No archaeological resources were identified during the Stage 2 archaeological assessment of the study area. Thus, in accordance with Section 2.2 and Section 7.8.4 of the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **no further land-based archaeological assessment of the study area is required (Figure 11)**.

The portion of the study area containing the Detroit River retains potential for the identification of marine archaeological resources (FAC 2020; see Figure 11). The in-water portion of the study area requires marine archaeological assessment as recommended by the Stage 1 assessment of the study area for the Project (FAC 2020). Thus, further archaeological assessment of the marine portion of the study area is required. As portions of the St. Rose PS study area overlap the Detroit River, Project components and anticipated construction may impact the riverbed. These activities have the potential to impact submerged cultural resources. **Stantec recommends that a Marine Archaeological Overview Assessment (MAOA) be completed for the portion of the study area which includes the Detroit River**.

The MAOA is a desktop-based assessment, similar to a land-based Stage 1 archaeological assessment. The objective of the MAOA will be to gather information about the study area's geography, history, current conditions, registered/listed marine archaeological resources, and previous archaeological research within the vicinity of the study area. This assessment will provide a description and detailed evaluation of features of marine archaeological potential noted for the study area. The MAOA will also identify any areas within the study area that have been subject to extensive and deep land alterations (e.g., disturbances such as dredging, waterway modification, etc.) that have eradicated any potential for the identification and documentation of submerged archaeological resources.

The MHSTCI is asked to review the results presented and to accept this report into the *Ontario Public Register of Archaeological Reports*.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

In accordance with Section 7.5.9 of the MHSTCI'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 verbatim from the MHSTCI's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011).

This report is submitted to the Minister of Heritage, Sport, Tourism and Culture Industries 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 1990c). 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 Heritage, Sport, Tourism and Culture Industries, 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 1990c) 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 1990c).

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 1990c). 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 1990c).

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 Government and Consumer Services.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the *Ontario Heritage Act* (Government of Ontario 1990c) and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

7.0 BIBLIOGRAPHY AND SOURCES

Archives of Ontario. 2014. Detroit. In *French Ontario in the 17th and 18th Centuries*. Electronic document: http://www.archives.gov.on.ca/en/explore/online/franco_ontarian/detroit.aspx. Last accessed October 8, 2021.

Belden, H. & Co. 1881. Essex Supplement. In *Illustrated Atlas of the Dominion of Canada.* Toronto: H. Belden and Co.

Birch, Jennifer and Ronald F. Williamson. 2013. *The Mantle Site: An Archaeological History of an Ancestral Huron Wendat Community*. Lanham: Altamira Press.

Blackbird, Andrew J. 1887. *History of the Ottawa and Chippewa Indians of Michigan*. Ypsilanti: The Ypsilantian Job Print House. Electronic document: http://eco.canadiana.ca/view/oocihm.00429#oocihm.00429/3?r=0&s=1&_suid=142558197786609233669627186604. Last accessed October 8, 2021.

Borden, Charles E. 1952. A Uniform Site Designation Scheme for Canada. *Anthropology in British Columbia* 3:44-48.

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

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

Chaussegros de Léry, Gaspard-Joseph. 1752. *Carte de La Rivière du Detroit*. Paris: Department of Marine.

Clarke, John. 2010. *The Ordinary People of Essex: Environment, Culture, and Economy on the Frontier of Upper Canada.* Montreal and Kingston: McGill-Queen's University Press.

Cultural Resource Management Group Limited, Fisher Archaeological Consulting, Historic Horizon Inc., and Dillon Consulting Limited. 2005. *Archaeological Master Plan Study Report for the City of Windsor*. Report submitted to the City of Windsor, Windsor.

Detroit Historical Society. n.d. Belle Isle Park. Encyclopedia of Detroit. Electronic document: https://detroithistorical.org/learn/encyclopedia-of-detroit/belle-isle-park. Last accessed October 5, 2021.

Ellis, Chris J. 2013. Before Pottery: Paleoindian and Archaic Hunter-Gatherers. In *Before Ontario: The Archaeology of a Province,* edited by Marit K. Munson and Susan M. Jamieson, pp. 35-47. Montreal and Kingston: McGill-Queen's University Press.

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

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

Fisher Archaeological Consulting. 2020. *City of Windsor Sewer Master Plan, Type 2, City of Windsor: Archaeological Stage 1: Background Study in the Geographic Township of Sandwich, Essex County, Ontario*. Report on file with the Ministry of Heritage, Sport, Tourism and Culture Industries, Toronto. PIF Number P359-0117-2019.

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

Fuller, R.M. 1972. *Windsor Heritage.* Windsor: Herald Press Limited.

Garrad, Charles. 2014. *Petun to Wyandot: The Ontario Petun from the Sixteenth Century*. Edited by Jean-Luc Pilon and William Fox. Mercury Series, Archaeology Paper 174. Ottawa: University of Ottawa Press and Canadian Museum of History.

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

Government of Canada. 2010. *McKee's Purchase / L'achat de McKee*. Erected by the Historic Sites and Monuments Board of Canada. Electronic document: https://www.pc.gc.ca/apps/dfhd/page_nhs_eng.aspx?id=1183. Last accessed October 8, 2021.

Government of Ontario. 1990a. *Environmental Assessment Act, R.S.O. 1990, c. E.18*. Electronic document: https://www.ontario.ca/laws/statute/90e18. Last accessed October 8, 2021.

Government of Ontario. 1990b. *Freedom of Information and Protection of Privacy Act, R.S.O. 1990, CHAPTER F.31*. Electronic document: https://www.ontario.ca/laws/statute/90f31. Last accessed October 8, 2021.

Government of Ontario. 1990c. *Ontario Heritage Act, R.S.O. 1990, CHAPTER O.18.* Electronic document: https://www.ontario.ca/laws/statute/90o18. Last accessed October 8, 2021.

Government of Ontario. 2002. *Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, CHAPTER 33*. Electronic document: https://www.ontario.ca/laws/statute/02f33. Last accessed October 8, 2021.

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

Government of Ontario. 2021a. *Ontario Archaeological Sites Database Files, PastPortal.* Toronto: Ministry of Heritage, Sport, Tourism and Culture Industries. Last accessed October 8, 2021.

Government of Ontario. 2021b. *Ontario Public Register of Archaeological Reports, PastPortal.* Ministry of Heritage, Sport, Tourism and Culture Industries. Last accessed October 8, 2021.

Heidenreich, Conrad E. 1978. Huron. In *Handbook of North American Indians. Volume 15, Northeast*, edited by Bruce G. Trigger, pp. 368-388. Washington: Smithsonian Institution Press.

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

Iredell, Abraham. 1803. *Sandwich*. Map A35. Map on file with the Ministry of Natural Resources Crown Land Survey Records Office, Peterborough.

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

Lajeunesse, Ernest. 1960. *The Windsor Border Region: Canada's Southernmost Frontier.* Toronto: University of Toronto Press.

Lennox, Paul A. and William R. Fitzgerald. 1990. The Culture History and Archaeology of the Neutral Iroquoians. In Ellis and Ferris 1990, pp. 405-456.

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

Lytwyn, Victor P. 2009. *Walpole Island First Nation: Traditional Ecological Knowledge Study: Dawn Gateway Project*. Walpole Island First Nation: Walpole Island Heritage Centre.

Mayer Heritage Consultants Inc. 2005. *Archaeological Assessment (Stage 1), Proposed Vista Improvement, Riverside Drive East and West, City of Windsor, County of Essex, Ontario*. Report on file, Toronto: Ministry of Heritage, Sport, Tourism and Culture Industries. PIF number P040-092.

McNiff, Patrick. 1956. *Patrick McNiff's Plan of the Settlements at Detroit, 1796*. Ann Arbor: University of Michigan Press.

Morris, J.L. 1929. *Memorandum for Suveyor-General. Re Sandwich Township Notes. Lots 1 to 156. Front Concession. File Number FNB 612*. Unpublished memorandum on file with the Ministry of Northern Development, Mines, Natural Resources and Forestry, Crown Land Survey Records Office, Peterborough, Ontario.

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

Morrison, Neil F. 1954. *Garden Gateway to Canada: One Hundred Years of Windsor and Essex County*. Toronto: Ryerson Press.

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

Neal, Frederick. 1909. *The Township of Sandwich, Past and Present*. Windsor: The Record Printing Co.

Owen, W.F.W.. 1828. *A Survey of the River Detroit: From Lake Erie to Lake St. Clair by Capt. W. F. W. Owen & Assistants in 1815*. London: J. & C. Sculpt.

Richards, N. R., A. G. Caldwell, and F. F. Morwick. 1949. *Soil Survey of Essex County. Report No. 11 of the Ontario Soil Survey*. Experimental Farms Service, Dominion Department of Agriculture and the Ontario Agricultural College.

Rogers, Edward S. 1978. Southeastern Ojibwa. In *Handbook of North American Indians, Volume 15 Northeast*. Edited by Bruce G. Trigger, pp. 760-771. Washington: Smithsonian Institution Press.

Steckley, John. 2014. *The Eighteenth Century Wyandot: A Clan-Based Study*. Waterloo: Wilfrid Laurier University Press.

Stewart, Andrew M. 2013. Water and Land. In *Before Ontario: The Archaeology of a Province,* edited by Marit K. Munson and Susan M. Jamieson, pp. 24-34. Montreal and Kingston: McGill-Queen's University Press.

Tooker, Elisabeth. 1978. Wyandot. In *Handbook of North American Indians. Volume 15, Northeast*, edited by Bruce G. Trigger, pp.418-441. Washington: Smithsonian Institution Press.

Trigger, Bruce G. 1978. Early Iroquoian Contacts with Europeans. In *Handbook of North American Indians*. *Volume 15, Northeast*, edited by Bruce G. Trigger, pp. 344-356. Washington: Smithsonian Institution Press.

Walling, H.F. 1877. *Map of Essex County, Ontario*. Toronto: R.M. Tackabury.

Walpole Island First Nation. n.d. *Bkejwanong Walpole Island First Nation*. Online resource: http://walpoleislandfirstnation.ca/ Last accessed October 8, 2021.

Williamson, Ronald F. 2013. The Woodland Period, 900 BCE to 1700 CE. In *Before Ontario: The Archaeology of a Province,* edited by Marit K. Munson and Susan M. Jamieson, pp. 48-61. Montreal and Kingston: McGill-Queen's University Press.

8.0 IMAGES

8.1 PHOTOGRAPHS

Photo 1: Test pit survey, facing southwest

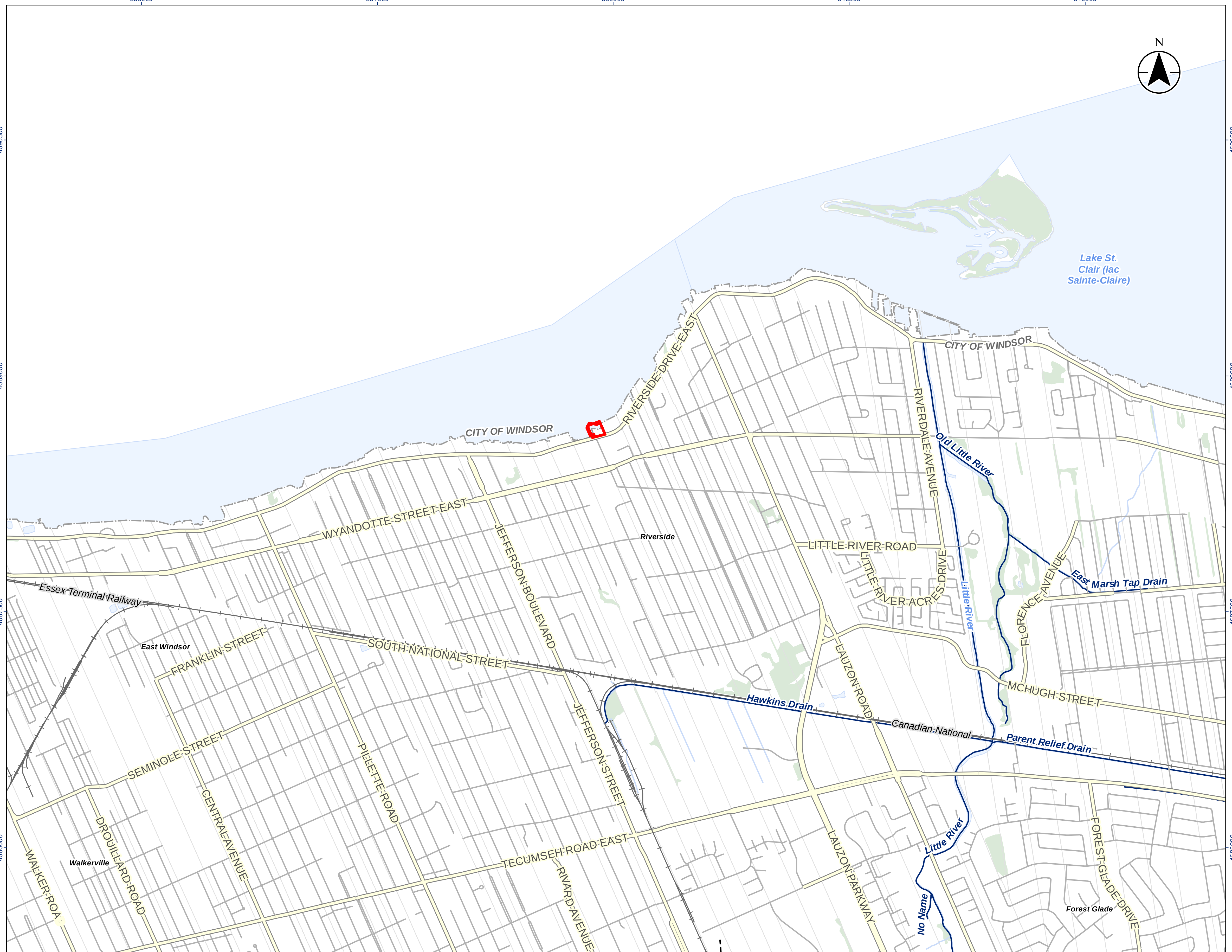
Photo 2: Test pit survey, facing northeast

Photo 3: Test pit survey, facing northwest

Photo 4: View of previously assessed area, facing northwest

9.0 MAPS

General maps of the study area follow on succeeding pages.



Stantec

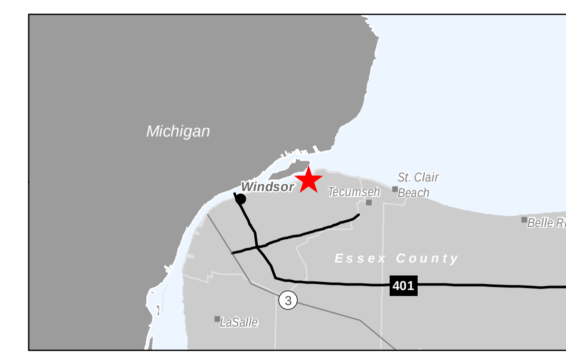
Legend

- Study Area
- Constructed Drain
- Gas Pipeline
- Major Road
- Minor Road
- Railway
- Watercourse
- Lot/Concession Boundary
- Municipal Boundary, Lower
- Waterbody
- Wooded Area

0 0.5 1 km

1:25,000 (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, 2021.



Project Location
City of Windsor

160961439 REVA
Prepared by KB on 2021-10-22
Technical Review by BC on 2021-10-22

Client/Project
STAGE 2 ARCHAEOLOGICAL ASSESSMENT: ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
1

Title
Project Location

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Stantec

Legend

Study Area

0 25 50 Meters

1:1,000 (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, 2021.
3. Orthoimagery © First Base Solutions, 2021. Imagery Date, 2019.

Project Location
City of Windsor

160961439 REVA
Prepared by KB on 2021-10-22
Technical Review by BC on 2021-10-22

Client/Project
STAGE 2 ARCHAEOLOGICAL ASSESSMENT: ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
2

Title
Location of Study Area

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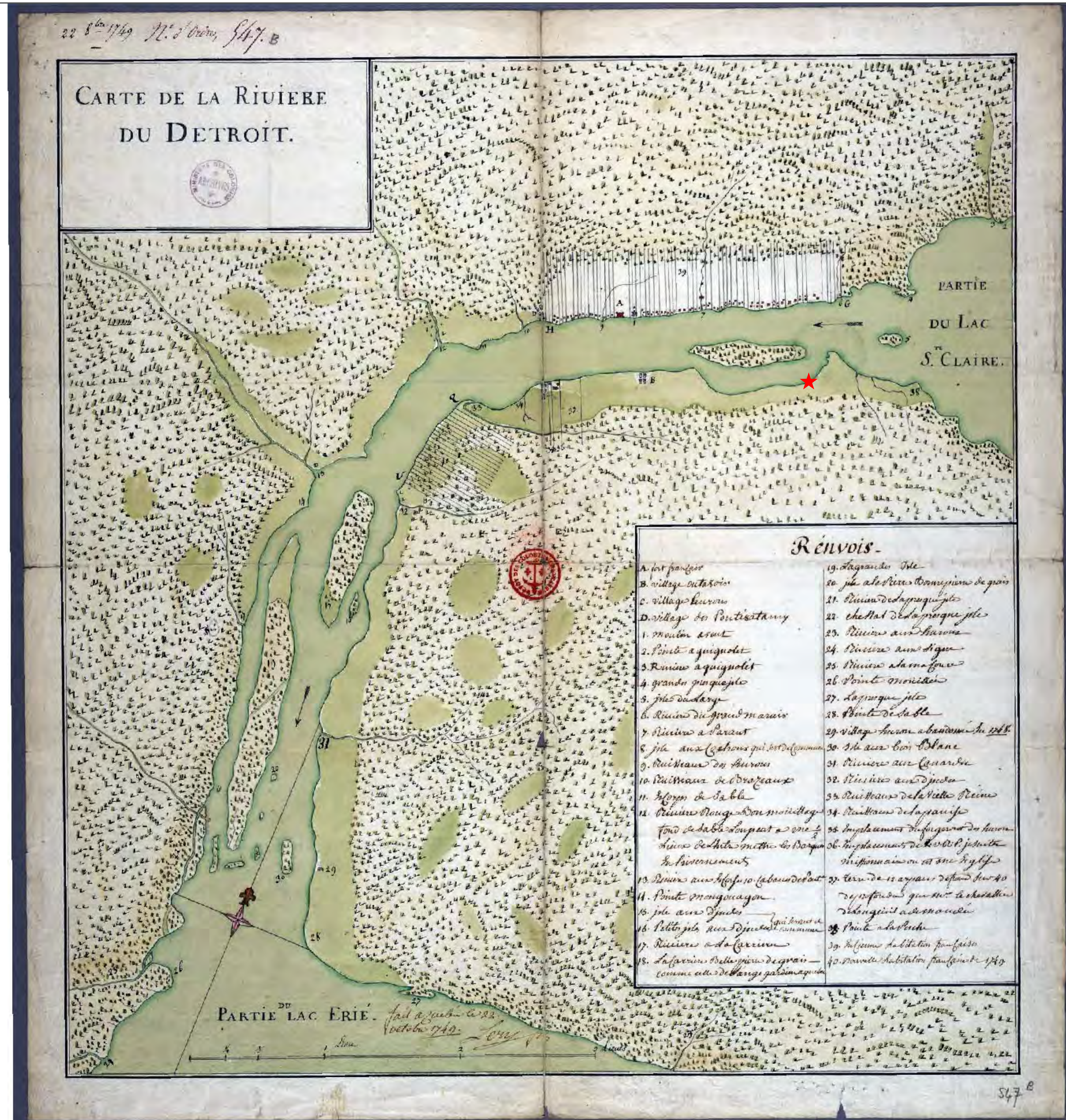

Stantec

Legend

★ Study Area

Figure Not to Scale

Notes

1. Reference: Chaussegros de Lery, Gaspar-Joseph. 1752. Carte de La Riviere du Detroit depuis de le Lac Erie jusques au Lac S. Claire. Department of Marine, Paris.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2021-10-22
Technical Review by BC on 2021-10-22

Client/Project
STAGE 2 ARCHAEOLOGICAL ASSESSMENT:
ST. ROSE PUMPING STATION MUNICIPAL CLASS
ENVIRONMENTAL ASSESSMENT

Figure No.
3

Title
Portion of the 1749 Map of the Detroit River

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Stantec

Legend

★ Study Area

Figure Not to Scale

Notes

1. Reference: Government of Canda. n.d.a. Map of Treaty Areas in Upper Canada. Ottawa: Department of Indian Affairs. Survey Branch.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2021-10-22
Technical Review by BC on 2021-10-22

Client/Project
STAGE 2 ARCHAEOLOGICAL ASSESSMENT:
ST. ROSE PUMPING STATION MUNICIPAL CLASS
ENVIRONMENTAL ASSESSMENT

Figure No.
4

Title
Map of Treaty Areas of Upper Canada

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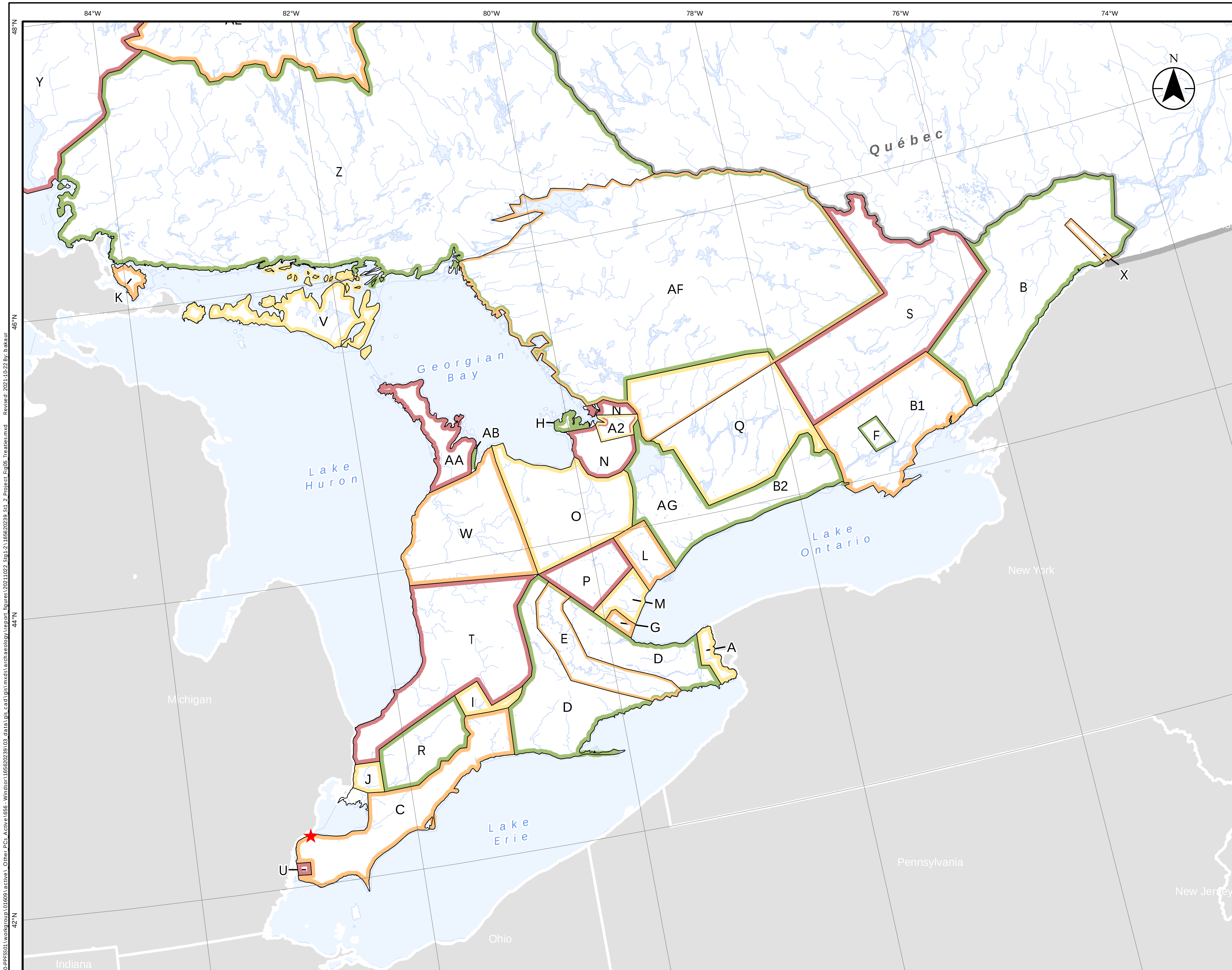

Stantec

Legend

Study Area

Waterbody

- **A** Treaty No. 381, May 9th, 1781 (Mississauga and Chippewa)
- **AA** Treaty No. 72, October 30th, 1854 (Chippewa)
- **AB** Treaty No. 82, February 9th, 1857 (Chippewa)
- **AE** Treaty No. 9, James Bay 1905, 1906 (Ojibway and Cree)
- **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. 6, September 7th, 1796 (Chippewa)
- **J** Treaty No. 7, September 7th, 1796 (Chippewa)
- **K** Treaty No. 11, June 30th, 1798 (Chippewa)
- **L** Treaty No. 13, August 1st, 1805 (Mississauga)
- **M** Treaty No. 13A, August 2nd, 1805 (Mississauga)
- **N** Treaty No. 16, November 18th, 1815 (Chippewa)
- **O** Treaty No. 18, October 17th, 1818 (Chippewa)
- **P** Treaty No. 19, October 28th 1818 (Chippewa)
- **Q** Treaty No. 20, November 5th, 1818 (Chippewa)
- **R** Treaty No. 21, March 9th, 1819 (Chippewa)
- **S** Treaty No. 27, May 31st, 1819 (Mississauga)
- **T** Treaty No. 27½, April 25th, 1825 (Ojibwa and Chippewa)
- **U** Treaty No. 35, August 13th, 1833 (Wyandot or Huron)
- **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
City of Windsor

165620239 REVA
Prepared by KB on 2021-10-22
Technical Review by BC on 2021-10-22

Client/Project
STAGE 2 ARCHAEOLOGICAL ASSESSMENT:
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
5

Title
Treaties and Purchases (Adapted from Morris 1943)

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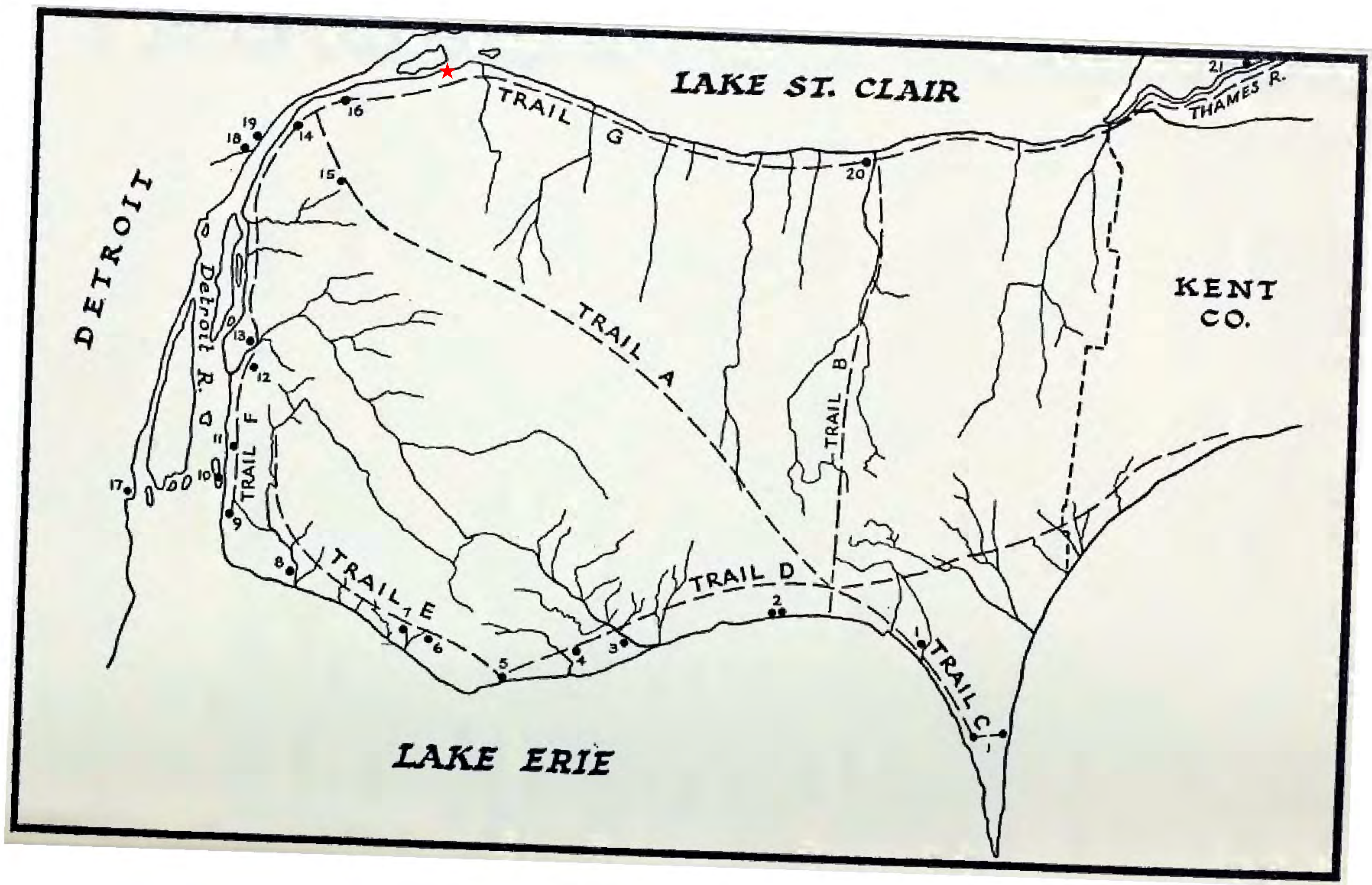

Legend

★ Study Area

Figure Not to Scale

Notes

1. Reference: Lajeunesse, Ernest J. 1960. The Windsor Border Region: Canada's Southernmost Frontier. The Champlain Society. Toronto: University of Toronto Press.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2021-10-22
Technical Review by BC on 2021-10-22

Client/Project
STAGE 2 ARCHAEOLOGICAL ASSESSMENT:
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
6

Title
Documented Indigenous Activity in Essex County

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Legend

Study Area

Figure Not to Scale

Notes

1. Reference: Iredell, Abraham. 1803. Sandwich. Map A35. Unpublished map, on file with the Ministry of Natural Resources Crown Land Survey Records Office, Peterborough, Ontario.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2021-10-28

Client/Project
STAGE 2 ARCHAEOLOGICAL ASSESSMENT:
ST. ROSE PUMPING STATION MUNICIPAL CLASS
ENVIRONMENTAL ASSESSMENT

Figure No.
7

Title
Portion of the 1803 Plan of Sandwich Township

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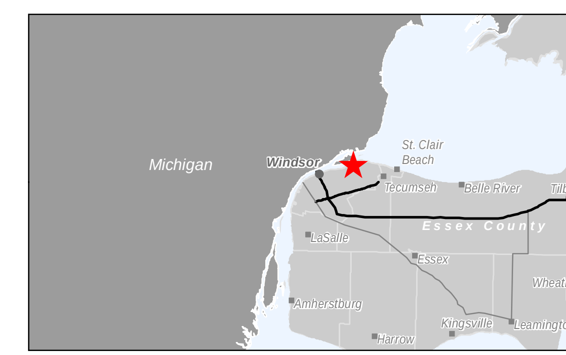
Legend

Study Area

Figure Not to Scale

Notes
1. Reference: Owen, W.F.W., Captain R.N. 1828 A Survey of the River Detroit: From Lake Erie to Lake St. Clair. J and C Walker. Library and Archives Canada.



Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2021-10-27
Technical Review by BC on 2021-10-22

Client/Project
STAGE 2 ARCHAEOLOGICAL ASSESSMENT:
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
8

Title
Portion of the 1828 Map of a Survey of the Detroit River

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Stantec

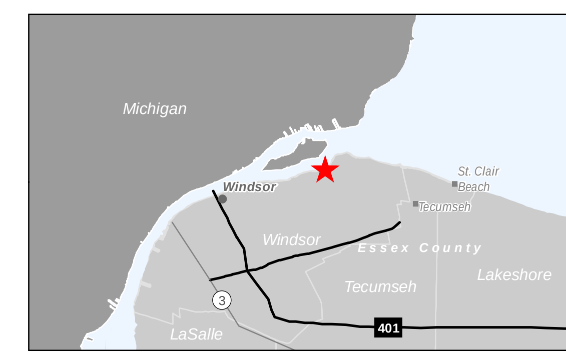
Legend

Study Area

Figure Not to Scale

Notes

1. Reference: Walling, H.F. 1877. Map of Essex County, Ontario. R.M. Tackabury.



Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2021-10-28
Technical Review by BC on 2021-10-22

Client/Project
STAGE 2 ARCHAEOLOGICAL ASSESSMENT:
ST. ROSE PUMPING STATION MUNICIPAL CLASS
ENVIRONMENTAL ASSESSMENT

Figure No.
9

Title
Portion of the 1877 Map of Essex County

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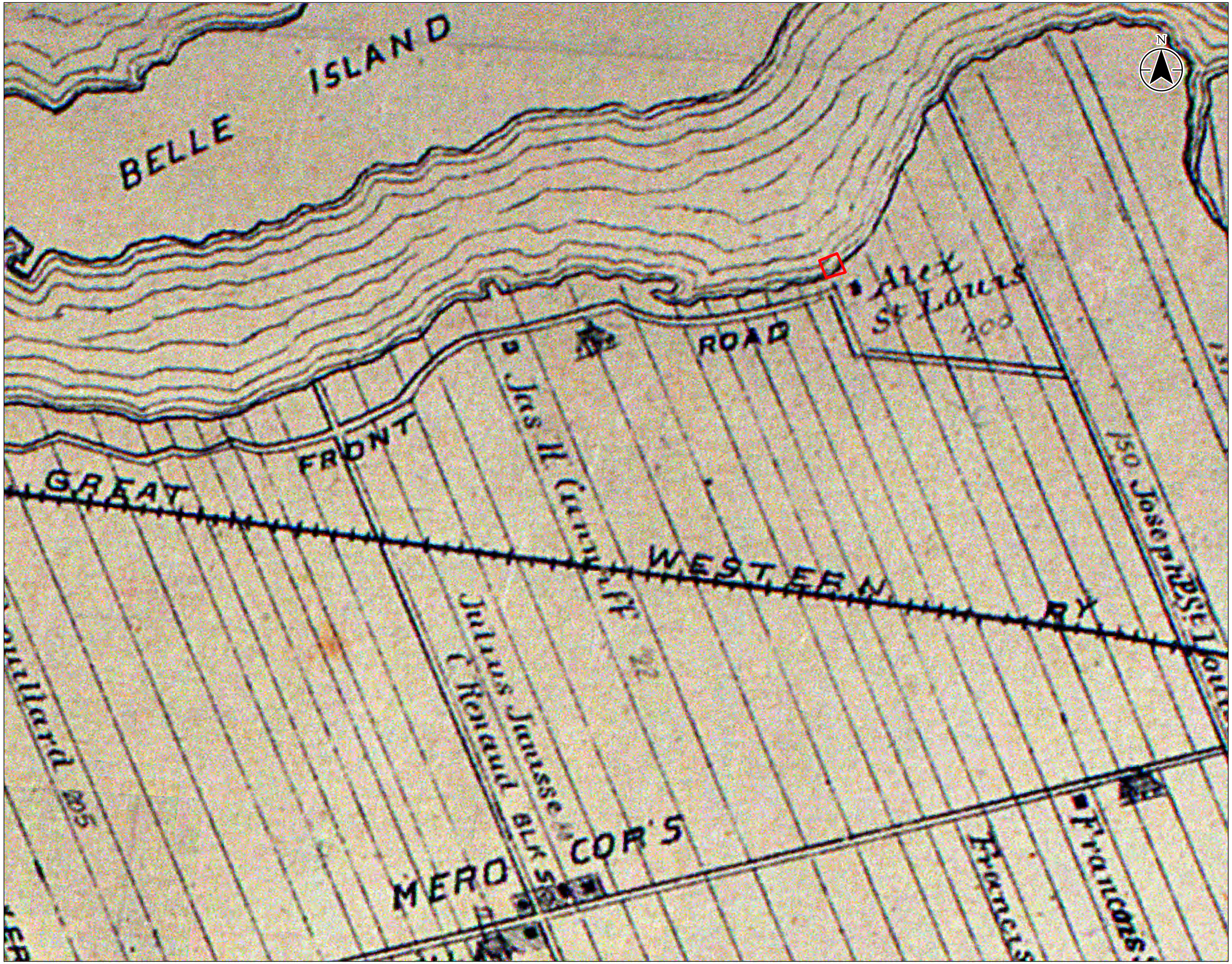
\\CA0220-PPFSS01\workgroup\01609\active_Other_PCs_Active\656 - Windsor\165620239\03_data\gis_cad\gis\mxds\archaeology\report_figures\20211022_Stg1-2\165620239_St1_2_Project_Fig09_1877Historic.mxd Revised: 2021-10-28 By: bakaur



Stantec

Legend

Study Area

Figure Not to Scale

Notes

1. Reference: Belden, H. and Co. 1881. Essex Supplement in Illustrated Historical Atlas of the Dominion of Canada. Toronto: Belden and Co.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2021-10-28
Technical Review by BC on 2021-10-22

Client/Project
STAGE 2 ARCHAEOLOGICAL ASSESSMENT: ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
10

Title
Portion of the 1881 Map of Sandwich Township

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Stantec

Legend

Study Area

Photo Location and Direction

Assessment_method

Marine Assessment Required (FAC 2020)

Previously Assessed (FAC 2020)

Test Pit Survey, 5 m Intervals

0 10 20 Metres

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

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2021.
3. Orthoimagery © First Base Solutions, 2021. Imagery Date, 2019.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2021-10-28
Technical Review by BC on 2021-10-22

Client/Project
STAGE 2 ARCHAEOLOGICAL ASSESSMENT: ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
11

Title
Stage 2 Methods and Results

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10.0 CLOSURE

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

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

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available and the results of the work. The conclusions are based on the conditions encountered by Stantec at the time the work was performed. Due to the nature of archaeological assessment, which consists of systematic sampling, Stantec does not warrant against undiscovered environmental liabilities or that the sampling results are indicative of the condition of the entire property.

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

Quality Review ___________________________________

(signature)

Parker Dickson – Senior Associate, Senior Archaeologist

Independent Review________________________________

(signature)

Tracie Carmichael – Managing Principal, Environmental Services

APPENDIX D

Ministry of Tourism, Culture and Sport Letter Affirming Entry of 'Stage 2 Archaeological Assessment Report' into the Ontario Public Register

Ministry of Tourism, Culture and Sport (MTCS)

Archaeology Program Unit
Programs and Services Branch
Heritage, Tourism and Culture Division
5th Floor, 400 University Ave.
Toronto ON M7A 2R9
Tel.: (416) 418-0949
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Ministère du Tourisme, de la Culture et du Sport (MTCS)

Unité des programme d'archéologie
Direction des programmes et des services
Division du patrimoine, du tourisme et de la culture
5e étage, 400 ave. University
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Email: Zeeshan.Abedin@ontario.ca

Ontario

Jul 6, 2022

Parker S. Dickson (P256)
Stantec Consulting
171 Queens London ON N6A 5J7

RE: Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "Stage 2 Archaeological Assessment: St. Rose Pumping Station Municipal Class Environmental Assessment, Part of Lots 122 and 123, Concession 1 Petite Côte, Geographic Township of Sandwich East, former County of Essex, now City of Windsor, Ontario", Dated Jul 6, 2022, Filed with MHSTCI Toronto Office on N/A, MHSTCI Project Information Form Number P256-0697-2021, MHSTCI File Number 0008580

Dear Mr. Dickson:

The above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18, has been entered into the Ontario Public Register of Archaeological Reports without technical review.[1]

Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require further information, please do not hesitate to send your inquiry to Archaeology@Ontario.ca

cc. Archaeology Licensing Officer
Janelle Combs,City of Windsor
Anna Godo,City of Windsor

1 *In no way will the ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report(s) or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or the Report(s) is otherwise found to be inaccurate, incomplete, misleading or fraudulent.*

APPENDIX D

Marine Archaeological Assessment Report

Marine Archaeological Overview Assessment: St. Rose Pumping Station Municipal Class Environmental Assessment

Part of the Detroit River, Adjacent to Part of Lots 122 and 123, Concession 1 Petite Côte, Geographic Township of Sandwich East, former County of Essex, now City of Windsor, Ontario

July 5, 2022

Prepared for:

Janelle Coombs
Engineering – Corporate Projects
305 City Hall Square West, Suite 310
P.O. Box 150
Windsor, Ontario N9A 6S1
Tel: 519-255-6100 ext. 6004

Prepared by:

Stantec Consulting Ltd.
600 – 171 Queens Avenue
London, Ontario N6A 5J7

Licensee: Darren Kipping, MA
Marine Archaeology Licence Number: 2022-02

Project Number: 165620239

ORIGINAL REPORT

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Executive Summary

Stantec Consulting Ltd. (Stantec) was retained by the City of Windsor (the City) to complete a Marine Archaeological Overview Assessment (MAOA) for the area to be impacted by the proposed St. Rose Pumping Station (PS) (the Project) which forms part of the City's Sewer Master Plan. The MAOA was undertaken by Stantec, on behalf of the City, as part of the preliminary planning and design process as part of the Municipal Class Environmental Assessment (Class EA) for the Project under the Ontario *Environmental Assessment Act* (Government of Ontario 1990a).

The Project study area is approximately 0.7 hectares and is located on Lots 122 and 123, Concession 1 Petite Côte, Geographic Township of Sandwich East, former Essex County, now City of Windsor, Ontario. The municipal address of the Project study area is 6902 Riverside Drive East, Windsor, Ontario. The in-water or marine portion of the Project study area, the Marine Study Area, is approximately 0.3 hectares within the Detroit River. A Stage 1 archaeological assessment of the Project study area was previously completed by Fisher Archaeological Consulting (FAC) in 2020 which recommended a marine archaeological assessment for the in-water impacts of the study area (FAC 2020). Stantec conducted a Stage 2 archaeological assessment for the terrestrial portion of the Project study area in 2021, which complements the MAOA presented herein (Stantec 2021).

As portions of the marine study area overlap with the Detroit River, potential in-water construction components may impact potential submerged cultural resources and the marine archaeological potential of the study area is being considered. Marine archaeological potential is established by determining the likelihood that marine archaeological resources may be present within the study area. *Ontario Regulation 170/04* (Government of Ontario 2004), issued under *Ontario Heritage Act* (Government of Ontario 1990c), defines a marine archaeological site as "…an archaeological site that is fully or partially submerged or that lies below or partially below the high-water mark". Marine archaeological potential criteria can include proximity to registered archaeological sites (terrestrial and marine), proximity to reported or registered wreck sites, proximity to active or historical harbours or marine terminals, proximity to watercourses and associated narrows, rapids, waterfalls, or portage routes, and also includes proximity to inundated landscapes (Government of Ontario 2016).

Due to deep and extensive river-bed disturbance from land reclamation activities, as well as a lack of any additional indicators of marine archaeological potential, it has been determined that the marine study area retains low to no potential for the identification and documentation of *in situ* Indigenous and Euro-Canadian marine archaeological resources. Therefore, **no further marine archaeological work is required for the study area.**

The MHSTCI 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.

Project Personnel

Project Manager:	Jian Li, Ph.D., P.Eng., PE
Licensed Archaeologist:	Darren Kipping, MA (P422)
GIS Specialist:	Baljeet Kaur, MA
Report Writer:	Darren Kipping, MA (P422)
Quality Review:	Tracie Carmichael, BA, B.Ed. (R140)
Independent Review:	Parker Dickson, MA (P256)

Acknowledgments

The City of Windsor:	Janelle Coombs, B.A.Sc. – Engineering – Corporate Projects
Ministry of Heritage, Sport, Tourism and Culture Industries:	Robert von Bitter – Archaeological Data Coordinator Andrea Williams – Archaeological Review Officer and Marine Licensing Officer

1.0 PROJECT CONTEXT

Stantec Consulting Ltd. (Stantec) was retained by the City of Windsor (the City) to complete a Marine Archaeological Overview Assessment (MAOA) for the area to be impacted by the proposed St. Rose Pumping Station (the Project) which forms part of the City's Sewer Master Plan (Figure 1). The MAOA was undertaken by Stantec, on behalf of the City, as part of the preliminary planning and design process as part of the Municipal Class Environmental Assessment (Class EA) for the Project under the Ontario *Environmental Assessment Act* (Government of Ontario 1990a).

The study area for the Project comprises approximately 0.7 hectares and is located on Lots 122 and 123, Concession 1 Petite Côte, Geographic Township of Sandwich East, former Essex County, now City of Windsor, Ontario. The municipal address of the Project study area is 6902 Riverside Drive East, Windsor, Ontario. The in-water or marine portion of the Project study area (the Marine Study Area) comprises approximately 0.3 hectares within the Detroit River (Figure 2). A Stage 1 archaeological assessment of the Project study area was previously completed by Fisher Archaeological Consulting (FAC) in 2020 which recommended a marine archaeological assessment for the in-water impacts of the study area (FAC 2020). Stantec conducted a Stage 2 archaeological assessment for the terrestrial portion of the Project study area in 2021, which complements the MAOA presented herein (Stantec 2021). Additional information related to the previous archaeological assessment of the study area is provided in Section 1.3.3.

As portions of the marine study area overlap with the Detroit River, potential in-water construction components may impact potential submerged cultural resources and the marine archaeological potential of the study area is being considered. Marine archaeological potential is established by determining the likelihood that marine archaeological resources may be present within the study area. *Ontario Regulation 170/04* (Government of Ontario 2004), issued under *Ontario Heritage Act* (Government of Ontario 1990c), defines a marine archaeological site as "…an archaeological site that is fully or partially submerged or that lies below or partially below the high-water mark". Marine archaeological potential criteria can include proximity to previously identified archaeological sites (terrestrial and marine), proximity to reported or registered wreck sites, proximity to active or historical harbours or marine terminals, proximity to significant watercourses and associated narrows, rapids, waterfalls, or portage routes, and also includes proximity to inundated landscapes (Government of Ontario 2016).

1.1.1 Objectives

As there are no provincial standards and guidelines for marine archaeology in Ontario, Stantec will apply criteria commonly used by the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) for terrestrial archaeological potential to determine areas of marine archaeological potential within the Project's anticipated footprint. The objectives of the MAOA/Background Study are as follows:

- To provide information about the study area's geography, history, recorded and registered, marine archaeological resources, previous archaeological fieldwork, and current marine conditions.

- To evaluate the study area's marine archaeological potential which will support recommendations for further marine archaeological survey for all or parts of the study area.
- To recommend appropriate strategies, if applicable, for further marine archaeological investigation.

To meet these objectives, Stantec's marine archaeologist employed the following research strategies:

- Review of relevant archaeological, historical, and environmental literature pertaining to the study area.
- Review of relevant historical, ethnographic, and scientific literature relevant to inundated landscapes and changes in shorelines within the study area.
- Review of relevant historical information for possible unknown wrecks within the vicinity of the study area.
- Query the *Ontario Archaeological Sites Database* to identify registered marine and terrestrial archaeological sites within the vicinity of the study area
- Query the *Ontario Public Register of Archaeological Reports* to identify registered marine and terrestrial archaeological assessment and investigations within the vicinity of the study area.
- Review of remote sensing studies, if available (e.g., hydrographic, bathymetric).
- Review of the Ontario Underwater Council (OUC), Save Ontario Shipwrecks (SOS), and National Oceanic and Atmospheric Association (NOAA) archives of submerged sites and shipwrecks.

Permission to enter the study area to conduct the archaeological assessment was provided by the City.

1.2 HISTORICAL CONTEXT

1.2.1 Post-contact Indigenous Resources

"Contact" is typically used as a chronological benchmark when discussing Indigenous archaeology in Canada and describes the contact between Indigenous and European cultures. 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).

At the turn of the 16th century, the study area is documented to have been occupied by the Western Basin Tradition archaeological culture (see Section 1.3.2). 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 Algonkian group occupying the western end of Lake Erie. It is argued, however, that the Attiwandaron (Neutral) expanded extensively westward, displacing the Fire Nation (Lennox and Fitzgerald 1990: 418-419). 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 oral tradition states that the Three Fires (a political confederacy constituted of the Potawatomi, Ojibwa, and Ottawa) have occupied the delta of the St. Clair River and the surrounding region continually for thousands of years (Walpole Island First Nation [WIFN] n.d.). In 1649, the Seneca, with the Mohawk, led a campaign into southern Ontario and dispersed the resident populations, and the Seneca used the lower Great Lakes basin as a prolific hinterland for beaver hunting (Heidenreich 1978; Trigger 1978:345).

By 1690, Ojibwa-speaking people had begun to displace the Seneca from southern Ontario. 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). 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 (Lytwyn 2009), and the Deshkaan Ziibing Anishnaabeg (Chippewas of the Thames First Nation). Some populations of Wyandot (an Indigenous population of historically amalgamated Petun and Huron-Wendat individuals) 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 Ottawa 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, 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). A 1749 French map of the Detroit River region (Chaussegros de Léry 1752) depicts Ottawa and Huron villages on the waterfront of the Windsor region (Figure 3).

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 still 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).

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

Following the American Revolutionary War, Britain (the Crown) focused on the settlement of European immigrants into what became the province of Upper Canada in 1791. To enable widespread settlement, the Crown negotiated a series of treaties with Indigenous peoples. One of the earliest treaties involving lands located in close proximity to the study area was made on May 19, 1790 (Figure 4). Originally identified as the Detroit Treaty, the chiefs of the Ottawa, Chippewa, Potawatomi, and Huron nations 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, Del[a]ware 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 Blenheim Memorial Park in Blenheim, Ontario reads:

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

(Government of Canada 2010)

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. The study area for the Project is located near Trail G. Trail G represents an early path along the south shore of Lake St. Clair, connecting the Thames River to Sandwich (now, the City of Windsor). This road was travelled by Governor Simcoe in 1793 (Lajeunesse 1960:xxxix).

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.

1.2.2 Euro-Canadian Resources

The first European passages along the Detroit River were likely completed by Jesuit missionaries in the 1640s and 1650s, as the strait (Detroit River) and Jesuit missions near the current spot of the city of Windsor are depicted on early maps of the area from this time (Lajeunesse 1960). However, the first exploration of the Detroit River was likely completed by Louis Jolliet on a return journey from surveying the copper mines of Lake Superior for the Governor of New France from 1669 to 1670 (Kellogg 1917:191). Although French missionaries, and certainly Jolliet, must have travelled along the Detroit River by canoe, no account of traversing the river exists until François Dollier de Casson and René Bréhent de Galinée did so in 1670 (Kellogg 1917:204). On Jolliet's return journey from Lake Superior, he happened to encounter Rene Robert Cavelier, Sieur de La Salle and two Sulpician missionaries Dollier and Galinée (Kellogg 1917:191). Jolliet shared his observations and maps with the Sulpician missionaries who split from La Salle to travel into the interior of the Great Lakes region, intending to follow the route suggested by Jolliet.

Travelling along the north shore of Lake Erie, Dollier and Galinée provided the first known written description of the Detroit River:

> *We pursued our journey accordingly towards the west, and after making about 100 leagues on Lake Erie arrived at the place where the Lake of the Hurons, otherwise called the Fresh Water Sea of the Hurons, or Michigan, discharges into this lake. This outlet is perhaps half a league in width and turns sharp to the northeast, so that we were almost retracing our path.*
>
> (Kellogg 1917:203)

The first European vessel to sail the Detroit River was *Le Griffon* in 1679, a seven-cannon barque (three-masted ship). *Le Griffon* was commissioned by La Salle, the governor of Fort Frontenac (present day Kingston, Ontario) from 1673 to 1679. The ship was constructed to explore the relatively unknown northwest regions of the Great Lakes for trade and collection of furs.

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 Detroit River (Fuller 1972:6-8). 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). The street pattern of the City of Windsor still reflects the French method of agricultural land division; for example, the long narrow parcels fronting the river where the "Petite côte" was located (Morrison 1954:3-4). In 1796, the original townsite of Sandwich was established to accommodate new immigrants of both French and British origin from the United States who wished to remain under British rule following American occupation of Detroit. This constituted the first urban settlement in what is now the City of Windsor and the first significant migration of English-speaking people into the Windsor area (Neal 1909:86-87).

Essex County was originally part of the District of Hesse, and in 1792 was renamed the Western District. On January 1, 1800, in the *Act for the Better Division of the Province*, the townships of Rochester, Mersea, Gosfield, Maidstone, Sandwich, and Malden were created as part of the County of Essex. The townships of Essex County were surveyed by Patrick McNiff, Abraham Iredell, and Thomas Smith (Clarke 2010).

As the area began to attract more Euro-Canadian interest, Patrick McNiff was assigned to survey and organize the area into a township, also to be named Sandwich. His survey of the township was completed in 1793. The form of the concessions noted as “Petite côte” were dictated by the land divisions already used by the French farmers in the “Petite côte” area, in what was to become Concession 1 Petite Côte. In fact, on his original township map where he measured the Concession 1 lots, Patrick McNiff notes that “on my measuring the farms in front from No. 1 to No. 154 found their division Lines to run in the very irregular manner they appear on the Plan” (McNiff 1956). The most accurate maps produced of the township at this time was completed by Abraham Iredell between 1797 and 1803, who resurveyed the area and renumbered the lots from Lot 82 onwards in Concessions 1 to 3 Petite Côte (Iredell 1803; Morris 1929). No landowner names are provided for Lots 122 and 123 on Iredell’s 1803 map (Figure 7). Belle Isle, across from the study area within the Detroit River, was originally called “Isle aux Cochons qui sert de Commune” (Hog Island now Belle Isle) by the French since the island was common land used for keeping livestock (Figure 7). In 1879, the City of Detroit bought the island from the Campau family and created a park, which eventually became known as Belle Isle (Detroit Historical Society n.d.).

The 1815 Royal Navy survey of the Detroit River by Captain W.F.W. Owen, published in 1828 (Owen 1828), depicts a relatively developed township and illustrates various structures/buildings, windmills, and roads/trails focused along the river’s edge (Figure 8). A structure is depicted close to the study area, and a dotted line along the shoreline shows that the water was shallow in this area.

The opening of the Welland Canal in 1829 connected Lake Erie to Lake Ontario and the St. Lawrence River (Desjardins 2003). During this period, commercial sailing flourished in the Great Lakes and the Detroit River until the introduction of large, steam-powered bulk carriers appeared in 1870 (Bamford 2007).

By the mid-1850s, the community of Windsor became more established and grew large enough to compete with the adjacent community of Sandwich for important industrial development. For example, the Great Western Railway chose Windsor over Sandwich as its termination point in 1854. The arrival of the railway also allowed for the foundation of Walkerville, the third oldest settlement that is now part of the City of Windsor. In 1857, Hiram Walker established his distillery in the downtown area of Windsor where the Great Western Railway first met the waterfront (Morrison 1954:26).

In 1858, both Windsor and Sandwich were incorporated as towns (Morrison 1954:42). In 1861, the Township of Sandwich was subdivided into the Townships of Sandwich West, Sandwich East, and Sandwich South (Neal 1909:12). The 1877 *Map of Essex County, Ontario* (Walling 1877) indicates that Hypolite Mailloux owned the portion of Lot 122 within the study area and Leon St. Louis owned the portion of Lot 123 within the study area (Figure 9). No structures are depicted on the 1861 within or adjacent to the study area, but Riverside Drive is depicted along the Detroit River shoreline up to Lot 123, and St. Rose Avenue running south and then east (Figure 9).

The 1881 Essex Supplement in the *Illustrated Atlas of the Dominion of Canada* (Belden & Co. 1881) lists Alex St. Louis as the landowner for Lot 123, and a structure is depicted near the Detroit River shoreline but not within or adjacent to the study area (Figure 10). No landowner is indicated for Lot 122. The Essex County historical atlas of 1881 documents a total population of 36,258 for Essex County at that time (Belden & Co. 1881:8). Of the total population, 25,303 settlers lived in rural settings, while 10,955 lived in urban settings (Belden & Co. 1881:8).

In discussing 18th and 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). Further, review of historical mapping has inherent accuracy difficulties due to potential error in georeferencing. Georeferencing 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 the historical cartography, historical maps may not translate accurately into real space points. This may provide obvious inconsistencies during historical map review.

In 1959, the opening of the St. Lawrence Seaway significantly changed the size of the bulk carriers that plied the Detroit River. Prior to the construction of the St. Lawrence Seaway, the canals of the St. Lawrence could only handle 250 foot (76.2 metre) vessels with drafts less than 14 feet (4.3 metres). The St. Lawrence Seaway allowed for 730 foot (220 metre) vessels with drafts of 25 feet (7.6 metres) (Jenish 2009). Large lake freighters could now operate freely from the Great Lakes, through the Detroit River and up the St. Lawrence. The main commercial shipping channel in the Detroit River is north of the study area on the south side of Belle Isle, known as the Fleming Channel (International Upper Great Lakes Study 2009).

Overall, the Detroit River in general, has been used as a major transportation route throughout the history of the region. It continues to be used today for large-scale commercial operations, as well as recreational activities and fishing.

1.2.2.1 Historical Aerial Photography

The proposed St. Rose Pumping Station (PS) study area is partially located on reclaimed land from the Detroit River, adjacent to a public park known as St. Rose Beach. Historical aerial photography from 1931 to 1997 details the development of the study area (Figure 11 and Figure 12).

In 1931, the Detroit River shoreline was further south, almost abutting Riverside Drive. The reclaimed land that the proposed St. Rose PS will be constructed on has not yet been developed and a private dock is seen near the southeast portion of the study area (Figure 11-1). By 1949, land reclamation activities created a rectangular-shaped peninsula of land to the east of the study area (Figure 11-2). By 1952, houses are constructed on the reclaimed peninsula to the east of the study area, and it appears as though the study area was subject to high-water conditions as little of the beach or land are visible above the high-water mark north of Riverside Drive. The private dock near the southeast portion of the study area also appears to have been removed (Figure 11-3). By 1956, additional houses have been constructed on the reclaimed land, and the water levels appear lower, showing a more prominent shoreline (Figure 11-4).

The historical aerial photo from 1961 highlights the extensive reclamation activities that occurred to create the current lands of the Project study area. The study area is almost completely impacted by deposited sediment and fill, creating an irregular rectangle of land protruding into the Detroit River (Figure 12-1). The reclaimed land within the study area appears more established and covered in vegetation by 1967 (Figure 12-2). It is also at this time, in 1967, that the City acquired the property to the west of the study area to create St. Rose Beach. As described in the Department of Parks and Recreation *A History of Windsor's Parks* (City of Windsor No Date [n.d.]), St. Rose Beach park land was acquired piecemeal by the City between 1967 and 1975. In 1972, a local group was working on plans to convert St. Rose Beach to a municipal landfill site, however environmental concerns and Department of Parks and Recreation intervention put an end to the proposal (City of Windsor n.d.). In 1975, the area was used as a storage yard for a large construction project nearby, which impacted the lawn and vegetation covering the park. In 1976, the City installed a break wall along the shoreline and re-landscaped the park following a large flood in the same year. A storm sewer outfall was constructed at the park and reinforced steel retaining walls were installed in 1979 (City of Windsor n.d.). These various improvements can be seen in the 1981 historical air photo (Figure 12-3). The study area appears to remain the same between 1981 and 1997, with the exception of the removal of a private dock west of the study area (Figure 12-4). Additional improvements to St. Rose Beach were completed in 2000 and 2001 to enhance the fish habitat and protect the park from river dynamics (City of Windsor n.d.).

1.3 ARCHAEOLOGICAL CONTEXT

1.3.1 The Natural Environment

The natural environment is an important indicator of archaeological potential. From Belle Isle to further downstream at Fighting Island, the underwater environment of the river consists of sand and clay and is generally broad and deep (International Upper Great Lakes Study 2009). In the case of submerged landscapes, the former and adjacent natural environment is also of relevance. Accordingly, a description of the study area's surrounding geography, physiography, and soils is provided below.

The study area is situated in the St. Clair Clay Plains physiographic region, as identified by Chapman and Putnam (1984). This region is described as:

> *Adjoining Lake St. Clair in Essex and Kent County 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 500 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)

Original soils in the study area along the Detroit River shoreline are classified as Brookston Clay (Richards *et al.* 1949). Although these soils may have been suitable for Indigenous or Euro-Canadian agriculture, their proximity to the river would have resulted in potential flooding. The majority of the study area is composed of fill, deposited between 1975 and 2000 to create and extend land north of the original shore into the river (see Figures 11 and 12; FAC 2020).

The Detroit River served as a potable water source to early Indigenous habitants and Euro-Canadian settlers. The Detroit River was designated as both a Canadian and American Heritage River in 2001. Use of the Detroit River has evolved over time, from being a transportation route used by early Indigenous inhabitants and Euro-Canadian explorers and settlers, to an industrial power source to support the early mills of the area, to a commercial shipping route, and finally to a water course used for recreational purposes throughout the 20th and 21st centuries.

1.3.2 Pre-contact Indigenous Resources

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

Period	Characteristics	Time Period	Comments
Early Paleo-Indian	Fluted Projectiles	9000 – 8400 BCE	spruce parkland/caribou hunters
Late Paleo-Indian	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 Point	2500 – 1800 BCE	increasing site size

Period	Characteristics	Time Period	Comments
	Broad Point	1800 – 1500 BCE	large chipped lithic tools
	Small Point	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	Couture Corded Pottery	400 BCE – 500 CE	increased sedentism
	Riviere au Vase Phase	500 – 800 CE	seasonal hunting and gathering
Late Woodland	Younge Phase	800 – 1200 CE	incipient agriculture
	Springwells Phase	1200 – 1400 CE	agricultural villages
	Wolf Phase	1400 – 1550 CE	earth worked villages, warfare
Contact Indigenous	Various Algonkian and Iroquoian Groups	1600 – 1875 CE	early written records and treaties
Historical	French/Euro-Canadian	1749 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 in particular 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. Since 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 (naturally occurring pure copper metal) (Ellis 2013:42). The known 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). 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 approximately 550 CE, evidence emergences for the introduction of maize into southern Ontario. This crop would have initially only supplemented the Indigenous 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 through 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 cultural affiliation of populations within the region of the study area at this time period is debated, whether they may have spoken a form of Iroquoian language or Algonquian (Murphy and Ferris 1990). The extant archaeological record demonstrates many cultural traits similar to historical Indigenous nations (Williamson 2013:55).

By the Late Woodland period there was a distinctive cultural occupation in southwestern Ontario, including Essex, Kent, and Lambton counties. The primary Late Woodland occupants of the Windsor area were populations described by archaeologists as belonging to the 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 centered 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 into four phases based on differences in settlement and subsistence strategies and pottery attributes. By the time of increased European interaction in the last half of the 16th century and early 17th century, there were no Western Basin Tradition sites in the Essex County area, having moved west into Michigan (Ferris 2009:32-33).

1.3.3 Registered Archaeological Sites and Surveys

In Canada, archaeological sites are registered within the Borden system, a national grid system designed by Charles Borden in 1952 (Borden 1952). The grid covers the entire surface area of Canada and is divided into major units containing an area that is two degrees in latitude by four degrees in longitude. Major units are designated by upper case letters. Each major unit is subdivided into 288 basic unit areas, each containing an area of 10 minutes in latitude by 10 minutes in longitude. The width of basic units reduces as one moves north due to the curvature of the earth. In southern Ontario, each basic unit measures approximately 13.5 kilometres east-west by 18.5 kilometres north-south. In northern Ontario, adjacent to Hudson Bay, each basic unit measures approximately 10.2 kilometres east-west by 18.5 kilometres north-south. Basic units are designated by lower case letters. Individual sites are assigned a unique, sequential number as they are registered. These sequential numbers are issued by the MHSTCI who maintain the *Ontario Archaeological Sites Database*. The study area under review straddles the boundary of two Borden Block designations: AbHr and AcHr.

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 1990b). 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 MHSTCI 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 no registered archaeological sites located within a one-kilometre radius of the study area (Government Ontario 2021a). A query of the *Ontario Public Register of Archaeological Reports* (Government of Ontario 2021b) identified three archaeological assessments within 50 metres of the study area (Table 2).

Table 2: Previous Archaeological Assessment Reports

Consultant	Report Title	Project Information Form (PIF) Number	Year
Mayer Heritage Consultants Inc.	*Archaeological Assessment (Stage 1), Proposed Vista Improvement, Riverside Drive East and West, City of Windsor, County of Essex, Ontario*	P040-092	2005
FAC	*City of Windsor Sewer Master Plan, Type 2, City of Windsor: Archaeological Stage 1: Background Study in the Geographic Township of Sandwich, Essex County, Ontario*	P359-0117-2019	2020
Stantec	*Stage 2 Archaeological Assessment: St. Rose Pumping Station Municipal Class Environmental Assessment Part of Lots 122 and 123, Concession 1 Petite Côte, Geographic Township of Sandwich East, former County of Essex, now City of Windsor, Ontario*	P256-0697-2021	2021

In 2005, Mayer Heritage Consultants Inc. (MHCI) conducted a Stage 1 assessment along Riverside Drive from Rosedale Avenue to the eastern boundary of the City of Windsor (MHCI 2005). MHCI (2005) determined that the road corridor was disturbed and had no archaeological potential, but that adjacent parks retained archaeological potential.

In 2020, FAC conducted a Stage 1 archaeological assessment for the Windsor Sewer Master Plan, which included the St. Rose PS study area (FAC 2020). FAC (2020) determined that the majority of the St. Rose PS study area was situated on land artificially created between 1975 and 2000 by infilling along the south shore of the Detroit River, and therefore retained no to low archaeological potential. However, a portion of the study area, between an existing disturbed and artificial and the edge northern edge of Riverside Drive, was determined to potentially represent the original shoreline of the Detroit River and retained archaeological potential. FAC (2020) also noted that the St. Rose PS property is located within 100 metres of pre-1800 Euro-Canadian settlement and adjacent to a historical road. FAC (2020) recommended Stage 2 archaeological assessment be undertaken on the south portion of the St. Rose PS study area prior to any construction impacts. In addition, FAC (2020) recommended that a marine archaeology assessment be undertaken for the portion of the study area extending into the Detroit River.

In 2021, Stantec was retained by the City of Windsor to complete a Stage 2 archaeological assessment for the area to be impacted by the proposed St. Rose PS as part of this Project (Stantec 2021). The Stage 2 archaeological assessment consisted of a test pit survey of the areas determined to retain archaeological potential by FAC (2020). No archaeological resources were identified during the Stage 2 archaeological assessment, and no further land-based archaeological assessment of the study area was recommended. The in-water portion of study area was identified as still requiring a marine archaeological assessment (Stantec 2021).

1.3.4 Marine Archaeological Resources

Early Indigenous peoples would have used the Detroit River for transportation and resource extraction. Travel by canoe, fishing, net fishing, and possible clam garden development activities likely would have occurred on or near the river. However, there are no registered Indigenous terrestrial or marine archaeological sites within one kilometre of the study area.

The earliest Euro-Canadian occupants of southern Ontario relied on Indigenous peoples to guide and supply watercraft and to transport people and materials. The first European vessel to sail the St. Clair River was *Le Griffon*, a seven-cannon barque (three-masted ship). The ship was commissioned by La Salle, and it was designed to sail from the Niagara River to Florida via Lake Erie to Lake Huron and Lake Michigan then down the Mississippi River (Thwaites 1896-1901, 58:103-105). *Le Griffon* sailed as far as Lake Michigan where it was lost in a storm at an unknown location (Bamford 2007).

An examination of the *Ontario Archaeological Sites Database*, the Ontario Underwater Council's wreck archive, SOS' *Marine Heritage Database* (SOS 2022), NOAA's *Wrecks and Obstructions Database* (NOAA 2022), and a review of relevant nautical literature (Heden 1966; Kohl 2008; Mills 1979; Swayze 1992) revealed one documented wreck within five kilometres of the study area. Little information is available regarding the wreck. The positional data was derived from NOAA's Automated Wreck and

Obstruction System (AWOIS) (NOAA 2022). The wreck is located approximately 4.8 kilometres northwest of the study area along the northern part of the Detroit River shoreline. The NOAA AWOIS information indicates that the wreck is likely modern and is 18 feet (5.48 metres) in length (NOAA 2022).

Further, an examination of relevant historical maritime and nautical literature and SOS' *Marine Heritage Database* (SOS 2022) identified an additional four vessels which have wrecked near the study area and whose locations have yet to be identified or were potentially salvaged. These vessels are believed to have wrecked off of or in the vicinity of Belle Isle, Michigan. It should be mentioned that there is the possibility of additional vessels which have wrecked near the study area whose provenience and historical background have not been documented. A list of the vessels which have wrecked near the study area is provided in Table 3 below, along with their type and year of loss.

Table 3: Vessels Wrecked Near the Study Area, Location Unknown

Vessel	Type	Year of Loss	Cause of Accident	Source
America	Salvage tug	1941	Capsized while pulling a stranded freighter off a sandbar near Belle Isle. Likely salvaged but not documented.	SOS 2022; Swayze 1992
Montpelier	Schooner	1907	Began to leak while transiting Detroit River near Belle Isle and sank.	SOS 2022; Swayze 1992
Oregon	Steamer	1855	Boiler exploded and sank near Belle Isle. Hull salvaged and rebuilt.	MHGL 2022; SOS 2022; Swayze 1992
Pine Lake	Steamer, dredge	1912	Sank following a collision with another vessel near Belle Isle. Wreck was dynamited to clear the navigation hazard.	SOS 2022; Swayze 1992

The background research for the study area did not identify any historical harbours, shipbuilding enterprises, terminals, marinas, maritime infrastructure, or lighthouses.

1.4 EXISTING CONDITIONS

The marine study area for the MAOA comprises approximately 0.3 hectares of shallow water of the near-shore portion of the Detroit River, located adjacent to part of Lots 122 and 123, Concession 1 Petite Côte, Geographic Township of Sandwich East, former Essex County, now City of Windsor, Ontario. The study area is located on the south part of the Detroit River, encompassed by retaining walls adjacent to St. Rose beach.

2.0 FIELD METHODS

No marine archaeological survey was conducted for the MAOA. However, photos taken during Stantec's terrestrial Stage 2 archaeological assessment are used in this report to provide context to the study area. Stantec's terrestrial Stage 2 archaeological assessment of the study area was conducted on October 1, 2021, under PIF number P256-0697-2021 issued to Parker Dickson, MA of Stantec by the MHSTCI (Stantec 2021).

Photographic documentation of the study area is provided in Section 7.1 of this report.

3.0 ANALYSIS AND CONCLUSIONS

Marine archaeological potential is established by determining the likelihood that archaeological resources may be present, submerged, partially submerged, and/or inundated within the study area. *Ontario Regulation 170/04* (Government of Ontario 2004), issued under the *Ontario Heritage Act* (Government of Ontario 1990c), defines a marine archaeological site as "…an archaeological site that is fully or partially submerged or that lies below or partially below the high-water mark". The marine archaeological potential modelling considers Indigenous and Euro-Canadian archaeological resources.

In the case of a marine archaeological assessment, the typical terrestrial archaeological potential criteria noted by the MHSTCI are used (Government of Ontario 2011), in conjunction with the potential criteria noted by the MHSTCI's *Criteria for Evaluating Marine Archaeological Potential, A Checklist for Non-Marine Archaeologists* (Government of Ontario 2016). These variables include proximity to registered archaeological sites (terrestrial and marine), proximity to reported or registered shipwrecks, proximity to active or historical harbours or marine terminals, proximity to navigable watercourses and associated narrows, rapids, or waterfalls, and proximity to possible inundated landscapes (Government of Ontario 2016). However, it is worth noting that extensive disturbance, including river and lakebed disturbance (e.g., dredging, engineered channeling, land reclamation, etc.), can eradicate archaeological potential as stated in Section 1.3.2 of the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

In addition to the factors noted above, Stantec also considers the following as indicators of marine archaeological potential:

- Proximity to reported lost ships/aircraft.
- Proximity to resource procurement areas (e.g., fishing, waterfowl hunting, plant collection zones, etc.).
- Proximity to inundated lakeshores, beaches, ridges, bluffs, streams, or riverbanks.
- Areas of early Euro-Canadian settlement and/or industry (e.g., early wharf, early dock or port complexes, shipbuilding, harbours, fishing villages, pioneer homesteads, etc.).
- Presence of transportation routes (e.g., navigable watercourses, portages, etc.).

Marine archaeological potential can also be extended to areas in, and adjacent to, the Detroit River that are associated with Indigenous and Euro-Canadian settlement that local histories or informants have identified with possible historical events, activities, or occupations.

Based on the above, the study area is associated with some indicators of marine archaeological potential. The study area is within a portion of the Detroit River, a primary source of potable water and a significant navigable watercourse. The Detroit River would have been a transportation route for Indigenous and early Euro-Canadian travelers. As described in Section 1.3.4, one wreck location and four vessels whose locations have yet to be identified were identified in proximity to the study area.

However, an examination of the *Ontario Archaeological Sites Database* showed that there are no terrestrial or marine archaeological sites registered within a one-kilometre radius of the study area. Background research did not identify any historical shipbuilding operations, marine terminals, harbours, marinas, lighthouses, occupations, or other maritime-related infrastructure within vicinity of the study area. Deep and extensive land reclamation operations within the study area in the early 1960s and installation of breakwaters and steel seawalls significantly altered the study area.

In summary, despite the existence of wrecked vessels within proximity to the study area, modern disturbances (i.e., land reclamation, construction activities), in combination with a lack of other marine archaeological potential indicators, it has been determined that the preservation of *in situ* marine archaeological resources is unlikely, and the potential for marine archaeological resources within the study area is considered low. Thus, it has been determined that the marine study area retains low to no potential for the identification of Indigenous and Euro-Canadian marine archaeological resources (Figure 13).

4.0 RECOMMENDATIONS

As mentioned above in Section 3.0, the Project study area exhibits indicators of marine archaeological potential, mainly due to the known and unknown wreck sites identified nearby. However, due to deep and extensive river-bed disturbance from land reclamation activities, as well as a lack of any additional indicators of marine archaeological potential, it has been determined that the marine study area retains low to no potential for the identification and documentation of *in situ* Indigenous and Euro-Canadian marine archaeological resources. Therefore, **no further marine archaeological work is required for the study area (Figure 13).**

However, if marine archaeological resources or potential marine archaeological resources are identified during pre-inspection of preliminary design work, or during any in-water related activities associated with the proposed construction, all activity in the vicinity should cease, and the MHSTCI should be contacted. The potential marine archaeological resources should be subject to examination by a marine archaeologist and further marine archaeological assessment may be conducted to document the remaining portions of the study area to prevent any further disturbance to *in situ* marine archaeological resources and to determine whether these archaeological resources require further evaluation.

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

5.0 ADVICE ON COMPLIANCE WITH LEGISLATION

In accordance with the MHSTCI'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 verbatim from the MHSTCI's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011).

This report is submitted to the Minister of Heritage, Sport, Tourism and Culture Industries 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 1990c). 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 Heritage, Sport, Tourism and Culture Industries, 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 1990c) 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 1990c).

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 1990c). 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 1990c).

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 Government and Consumer Services.

6.0 BIBLIOGRAPHY AND SOURCES

Archives of Ontario. 2014. Detroit. In *French Ontario in the 17th and 18th Centuries*. Electronic document: http://www.archives.gov.on.ca/en/explore/online/franco_ontarian/detroit.aspx. Last accessed January 19, 2022.

Bamford, D.A. 2007. *Freshwater Heritage: a History of Sail on the Great Lakes, 1670-1918*. Toronto: Natural Heritage Books.

Belden, H. & Co. 1881. Essex Supplement. In *Illustrated Atlas of the Dominion of Canada.* Toronto: H. Belden and Co.

Birch, Jennifer and Ronald F. Williamson. 2013. *The Mantle Site: An Archaeological History of an Ancestral Huron Wendat Community*. Lanham: Altamira Press.

Blackbird, Andrew J. 1887. *History of the Ottawa and Chippewa Indians of Michigan*. Ypsilanti: The Ypsilantian Job Print House. Electronic document: http://eco.canadiana.ca/view/oocihm.00429#oocihm.00429/3?r=0&s=1&_suid=142558197786609233669627186604. Last accessed January 19, 2022.

Borden, Charles E. 1952. A Uniform Site Designation Scheme for Canada. *Anthropology in British Columbia* 3:44-48.

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

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

Chaussegros de Léry, Gaspard-Joseph. 1752. *Carte de La Rivière du Detroit*. Paris: Department of Marine.

City of Windsor. No Date (n.d.). *A History of Windsor's Parks*. Department of Parks and Recreation. Electronic document: https://www.citywindsor.ca/residents/parksandforestry/City-Parks/Documents/CityofWindsorParksHistory.pdf. Last accessed January 20, 2022.

Clarke, John. 2010. *The Ordinary People of Essex: Environment, Culture, and Economy on the Frontier of Upper Canada.* Montreal and Kingston: McGill-Queen's University Press.

Cultural Resource Management Group Limited, Fisher Archaeological Consulting, Historic Horizon Inc., and Dillon Consulting Limited. 2005. *Archaeological Master Plan Study Report for the City of Windsor*. Report submitted to the City of Windsor, Windsor.

Desjardins, P. 2003. Navigation and Waterpower: Adaptation and Technology on Canadian Canals. *Industrial Archaeology* 29 (1), pp. 21-47.

Detroit Historical Society. n.d. Belle Isle Park. Encyclopedia of Detroit. Electronic document: https://detroithistorical.org/learn/encyclopedia-of-detroit/belle-isle-park. Last accessed January 19, 2022.

Ellis, Chris J. 2013. Before Pottery: Paleoindian and Archaic Hunter-Gatherers. In *Before Ontario: The Archaeology of a Province,* edited by Marit K. Munson and Susan M. Jamieson, pp. 35-47. Montreal and Kingston: McGill-Queen's University Press.

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

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

Fisher Archaeological Consulting. 2020. *City of Windsor Sewer Master Plan, Type 2, City of Windsor: Archaeological Stage 1: Background Study in the Geographic Township of Sandwich, Essex County, Ontario*. Report on file with the Ministry of Heritage, Sport, Tourism and Culture Industries, Toronto. PIF Number P359-0117-2019.

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

Fuller, R.M. 1972. *Windsor Heritage.* Windsor: Herald Press Limited.

Garrad, Charles. 2014. *Petun to Wyandot: The Ontario Petun from the Sixteenth Century*. Edited by Jean-Luc Pilon and William Fox. Mercury Series, Archaeology Paper 174. Ottawa: University of Ottawa Press and Canadian Museum of History.

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

Government of Canada. 2010. *McKee's Purchase / L'achat de McKee*. Erected by the Historic Sites and Monuments Board of Canada. Electronic document: https://www.pc.gc.ca/apps/dfhd/page_nhs_eng.aspx?id=1183. Last accessed January 19, 2022.

Government of Ontario. 1990a. *Environmental Assessment Act, R.S.O. 1990, c. E.18*. Electronic document: https://www.ontario.ca/laws/statute/90e18. Last accessed January 19, 2022.

Government of Ontario. 1990b. *Freedom of Information and Protection of Privacy Act, R.S.O. 1990, CHAPTER F.31*. Electronic document: https://www.ontario.ca/laws/statute/90f31. Last accessed January 19, 2022.

Government of Ontario. 1990c. *Ontario Heritage Act, R.S.O. 1990, CHAPTER O.18.* Electronic document: https://www.ontario.ca/laws/statute/90o18. Last accessed January 19, 2022.

Government of Ontario. 2002. *Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, CHAPTER 33*. Electronic document: https://www.ontario.ca/laws/statute/02f33. Last accessed January 19, 2022.

Government of Ontario. 2004. O. Reg. 170/04: *Definitions under Ontario Heritage Act, R.S.O. 1990, c. O.18*. Electronic document: https://www.ontario.ca/laws/regulation/040170. Last accessed January 14, 2022.

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

Government of Ontario. 2016. *Criteria for Evaluating Marine Archaeological Potential, A Checklist for Non-Marine Archaeologists*. Form 021-0503E. Electronic document: http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/FormDetail?OpenForm&ACT=RDR&TAB=PROFILE&SRCH=&ENV=WWE&TIT=criteria+for+evaluating+marine&NO=021-0503E. Last accessed January 14, 2022.

Government of Ontario. 2022a. *Ontario Archaeological Sites Database Files, PastPortal.* Toronto: Ministry of Heritage, Sport, Tourism and Culture Industries. Last accessed October 8, 2021.

Government of Ontario. 2022b. *Ontario Public Register of Archaeological Reports, PastPortal.* Ministry of Heritage, Sport, Tourism and Culture Industries. Last accessed October 8, 2021.

Heden, Karl E. 1966. *Directory of Shipwrecks of the Great Lakes*. Boston: Bruce Humphries Publishers.

Heidenreich, Conrad E. 1978. Huron. In *Handbook of North American Indians. Volume 15, Northeast*, edited by Bruce G. Trigger, pp. 368-388. Washington: Smithsonian Institution Press.

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

International Upper Great Lakes Study. 2009. *History of Dredging and Compensation St. Clair and Detroit Rivers*.

Iredell, Abraham. 1803. *Sandwich*. Map A35. Map on file with the Ministry of Natural Resources Crown Land Survey Records Office, Peterborough.

Jenish, D'Arcy. 2009. *The St. Lawrence Seaway: Fifty Years and Counting*. Manotick: Penumbra Press.

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

Kohl, Chris. 2008. *The Great Lakes Diving Guide Second Edition*. Chicago: Seawolf Communications Inc.

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

Lajeunesse, Ernest. 1960. *The Windsor Border Region: Canada's Southernmost Frontier.* Toronto: University of Toronto Press.

Lennox, Paul A. and William R. Fitzgerald. 1990. The Culture History and Archaeology of the Neutral Iroquoians. In Ellis and Ferris 1990, pp. 405-456.

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

Lytwyn, Victor P. 2009. *Walpole Island First Nation: Traditional Ecological Knowledge Study: Dawn Gateway Project*. Walpole Island First Nation: Walpole Island Heritage Centre.

Maritime History of the Great Lakes (MHGL). 2022. *Search*. Electronic Document: http://images.maritimehistoryofthegreatlakes.ca/search. Last accessed January 14, 2022.

Mayer Heritage Consultants Inc. 2005. *Archaeological Assessment (Stage 1), Proposed Vista Improvement, Riverside Drive East and West, City of Windsor, County of Essex, Ontario*. Report on file, Toronto: Ministry of Heritage, Sport, Tourism and Culture Industries. PIF number P040-092.

McNiff, Patrick. 1956. *Patrick McNiff's Plan of the Settlements at Detroit, 1796*. Ann Arbor: University of Michigan Press.

Mills, John M. 1979. *Canadian Coastal and Inland Steam Vessels, 1809-1930*. Providence: The Steamship Historical Society of America, Inc.

Morris, J.L. 1929. *Memorandum for Suveyor-General. Re Sandwich Township Notes. Lots 1 to 156. Front Concession. File Number FNB 612*. Unpublished memorandum on file with the Ministry of Northern Development, Mines, Natural Resources and Forestry, Crown Land Survey Records Office, Peterborough, Ontario.

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

Morrison, Neil F. 1954. *Garden Gateway to Canada: One Hundred Years of Windsor and Essex County*. Toronto: Ryerson Press.

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

National Oceanic and Atmospheric Association (NOAA). 2022. *Wrecks and Obstruction Database*. Electronic document: https://nauticalcharts.noaa.gov/data/wrecks-and-obstructions.html. Last accessed January 14, 2022.

Neal, Frederick. 1909. *The Township of Sandwich, Past and Present*. Windsor: The Record Printing Co.

Owen, W.F.W.. 1828. *A Survey of the River Detroit: From Lake Erie to Lake St. Clair by Capt. W. F. W. Owen & Assistants in 1815*. London: J. & C. Sculpt.

Richards, N. R., A. G. Caldwell, and F. F. Morwick. 1949. *Soil Survey of Essex County. Report No. 11 of the Ontario Soil Survey*. Experimental Farms Service, Dominion Department of Agriculture and the Ontario Agricultural College.

Rogers, Edward S. 1978. Southeastern Ojibwa. In *Handbook of North American Indians, Volume 15 Northeast*. Edited by Bruce G. Trigger, pp. 760-771. Washington: Smithsonian Institution Press.

Save Ontario Shipwrecks (SOS). 2022. *Marine Heritage Database*. Electronic document: https://saveontarioshipwrecks.ca/resources/marine-heritage-database/search/. Last accessed January 14, 2022.

Stantec Consulting Ltd. 2021. *Stage 2 Archaeological Assessment: St. Rose Pumping Station Municipal Class Environmental Assessment, Part of Lots 122 and 123, Concession 1, Petite Côte, Geographic Township of Sandwich East, former County of Essex, now City of Windsor, Ontario*. Report on file with the Ministry of Heritage, Sport, Tourism and Culture Industries, Toronto. PIF #: P256-0697-2021.

Steckley, John. 2014. *The Eighteenth Century Wyandot: A Clan-Based Study*. Waterloo: Wilfrid Laurier University Press.

Stewart, Andrew M. 2013. Water and Land. In *Before Ontario: The Archaeology of a Province,* edited by Marit K. Munson and Susan M. Jamieson, pp. 24-34. Montreal and Kingston: McGill-Queen’s University Press.

Stevens, E.W. 2004. *First Nations underwater archaeology of the Trent-Severn Waterway*. Copy on file at Parks Canada, Ottawa.

Swayze, David D. 1992. *Shipwreck! A Comprehensive Directory of Over 3,700 Shipwrecks on the Great Lakes*. Boyne City: Harbor House Publishers.

Thwaites, R.G. 1896-1901. *The Jesuit Relations and Allied Documents: Travel and Explorations of the Jesuit Missionaries in New France, 1610-1791*; the Original French, Latin, and Italian Texts, with English Translations and Notes. 73 volumes. Cleveland: Burrows Brothers.

Tooker, Elisabeth. 1978. Wyandot. In *Handbook of North American Indians. Volume 15, Northeast*, edited by Bruce G. Trigger, pp.418-441. Washington: Smithsonian Institution Press.

Trigger, Bruce G. 1978. Early Iroquoian Contacts with Europeans. In *Handbook of North American Indians*. *Volume 15, Northeast*, edited by Bruce G. Trigger, pp. 344-356. Washington: Smithsonian Institution Press.

Walling, H.F. 1877. *Map of Essex County, Ontario*. Toronto: R.M. Tackabury.

Walpole Island First Nation. n.d. *Bkejwanong Walpole Island First Nation*. Online resource: http://walpoleislandfirstnation.ca/ Last accessed January 19, 2022.

Williamson, Ronald F. 2013. The Woodland Period, 900 BCE to 1700 CE. In *Before Ontario: The Archaeology of a Province,* edited by Marit K. Munson and Susan M. Jamieson, pp. 48-61. Montreal and Kingston: McGill-Queen's University Press.

7.0 IMAGES

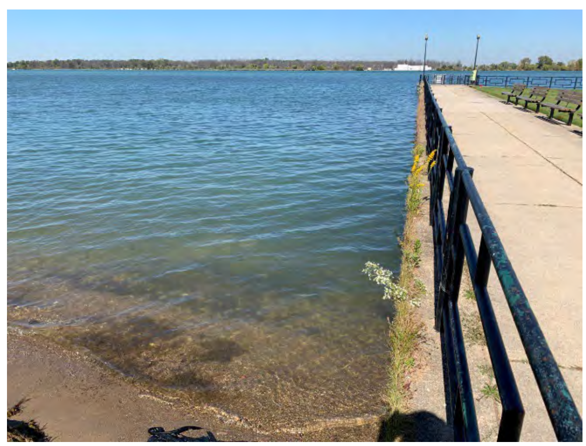
7.1 PHOTOGRAPHS

Photo 1: Showing retaining wall and portion of marine study area, facing southwest

Photo 2: Showing retaining wall and portion of marine study area, facing southeast

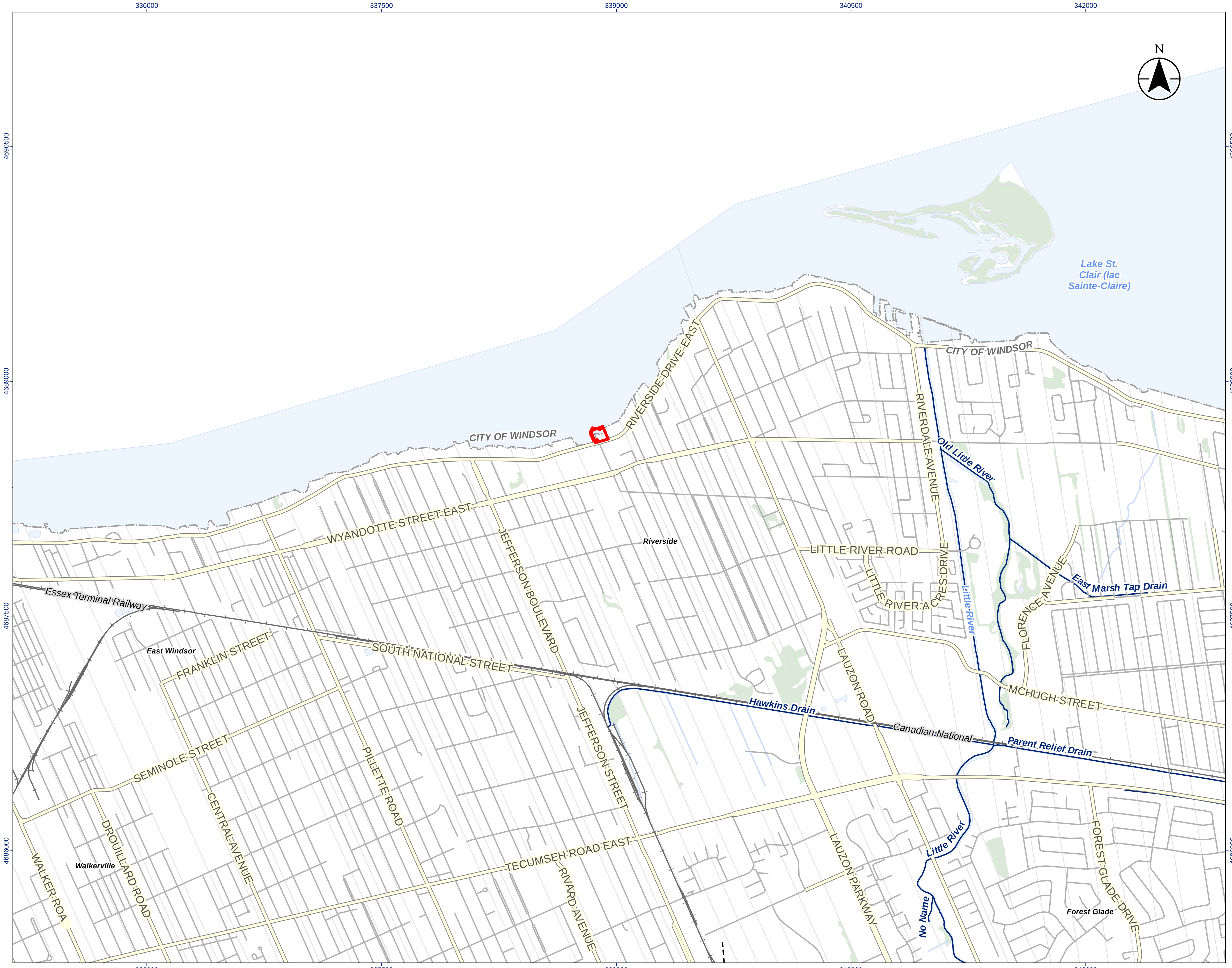
Photo 3: Showing retaining wall and portion of marine study area, facing south-southeast

Photo 4: Showing retaining wall and portion of marine study area, facing north-northwest



8.0 MAPS

General maps of the study area will follow on succeeding pages.



Stantec

Legend

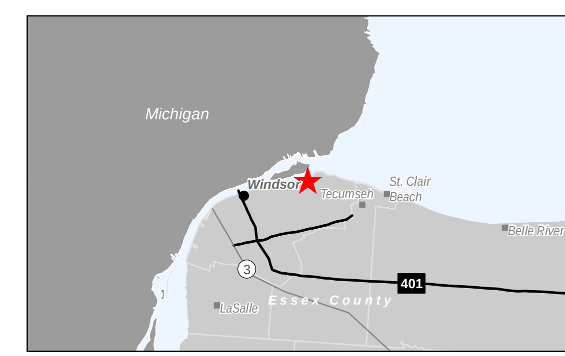
- Project Study Area
- Constructed Drain
- GAS Gas Pipeline
- Major Road
- Minor Road
- Railway
- Watercourse
- Lot/Concession Boundary
- Municipal Boundary, Lower
- Waterbody
- Wooded Area

0 500 1,000 m

1:25,000 (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, 2022.



Project Location
City of Windsor

160961439 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
1

Title
Project Location

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Legend

- Project Study Area
- Marine Study Area
- Terrestrial Study Area

0 25 50 m

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

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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3. Orthoimagery © First Base Solutions, 2021. Imagery Date, 2019.

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City of Windsor

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CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
2

Title
Location of Study Area

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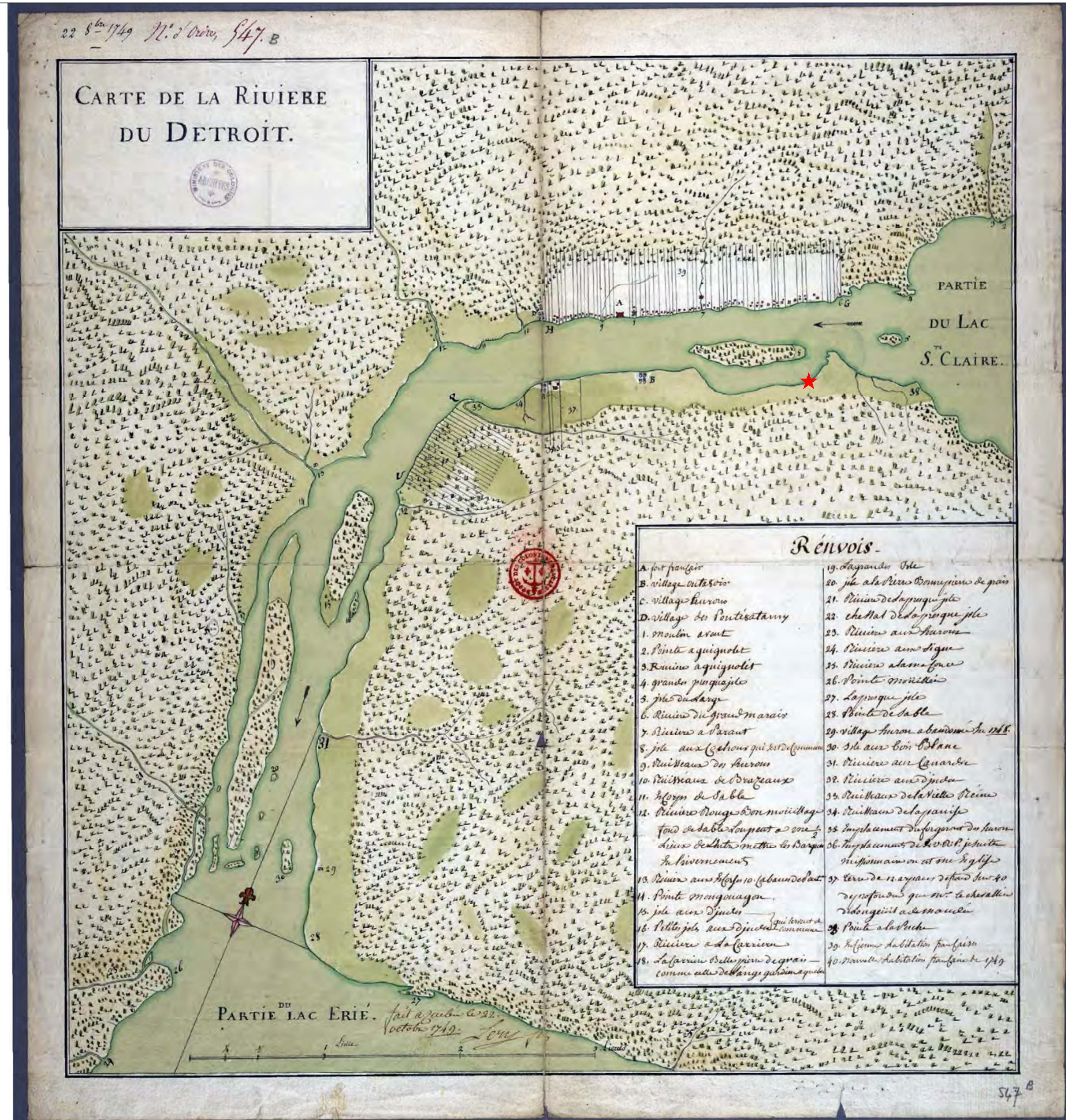

N

Stantec

Legend

★ Project Study Area (Approximate)

Figure Not to Scale

Notes

1. Reference: Chaussegros de Lery, Gaspar-Joseph. 1752. Carte de La Riviere du Detroit depuis de le Lac Erie jusques au Lac S. Claire. Department of Marine, Paris.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
3

Title
Portion of the 1749 Map of the Detroit River

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Legend

★ Project Study Area (Approximate)

Figure Not to Scale

Notes

1. Reference: Government of Canda. n.d.a. Map of Treaty Areas in Upper Canada. Ottawa: Department of Indian Affairs. Survey Branch.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
4

Title
Map of Treaty Areas of Upper Canada

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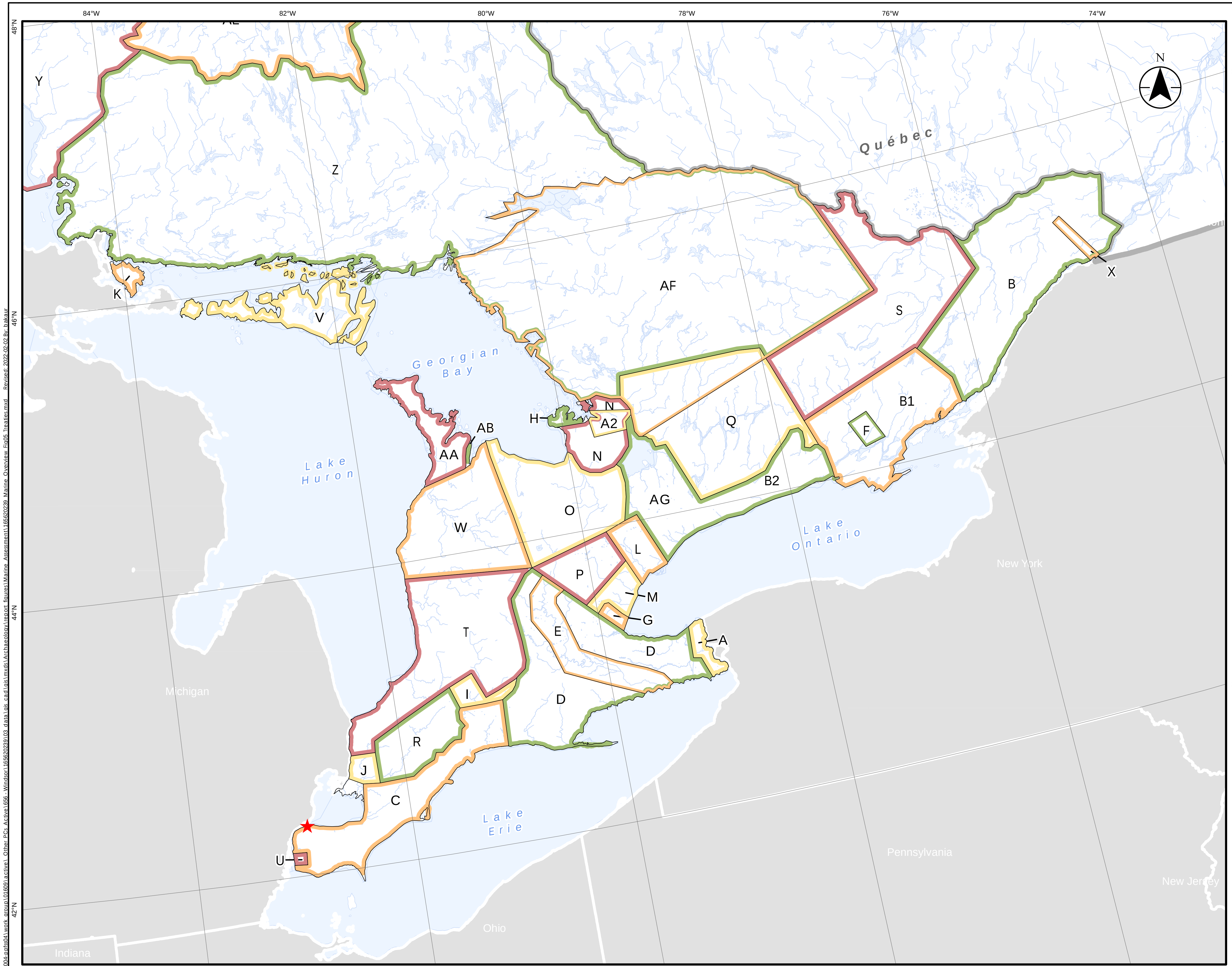

Stantec

Legend

Project Study Area

Waterbody

A Treaty No. 381, May 9th, 1781 (Mississauga and Chippewa)
AA Treaty No. 72, October 30th, 1854 (Chippewa)
AB Treaty No. 82, February 9th, 1857 (Chippewa)
AE Treaty No. 9, James Bay 1905, 1906 (Ojibway and Cree)
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. 6, September 7th, 1796 (Chippewa)
J Treaty No. 7, September 7th, 1796 (Chippewa)
K Treaty No. 11, June 30th, 1798 (Chippewa)
L Treaty No. 13, August 1st, 1805 (Mississauga)
M Treaty No. 13A, August 2nd, 1805 (Mississauga)
N Treaty No. 16, November 18th, 1815 (Chippewa)
O Treaty No. 18, October 17th, 1818 (Chippewa)
P Treaty No. 19, October 28th 1818 (Chippewa)
Q Treaty No. 20, November 5th, 1818 (Chippewa)
R Treaty No. 21, March 9th, 1819 (Chippewa)
S Treaty No. 27, May 31st, 1819 (Mississauga)
T Treaty No. 27½, April 25th, 1825 (Ojibwa and
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)

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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, 2022.
3. Treaty boundaries adapted from Morris 1943 (1964 reprint). For cartographic representation only.

Project Location: City of Windsor
165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW

Figure No.
5

Title
Treaties and Purchases (Adapted from Morris 1943)

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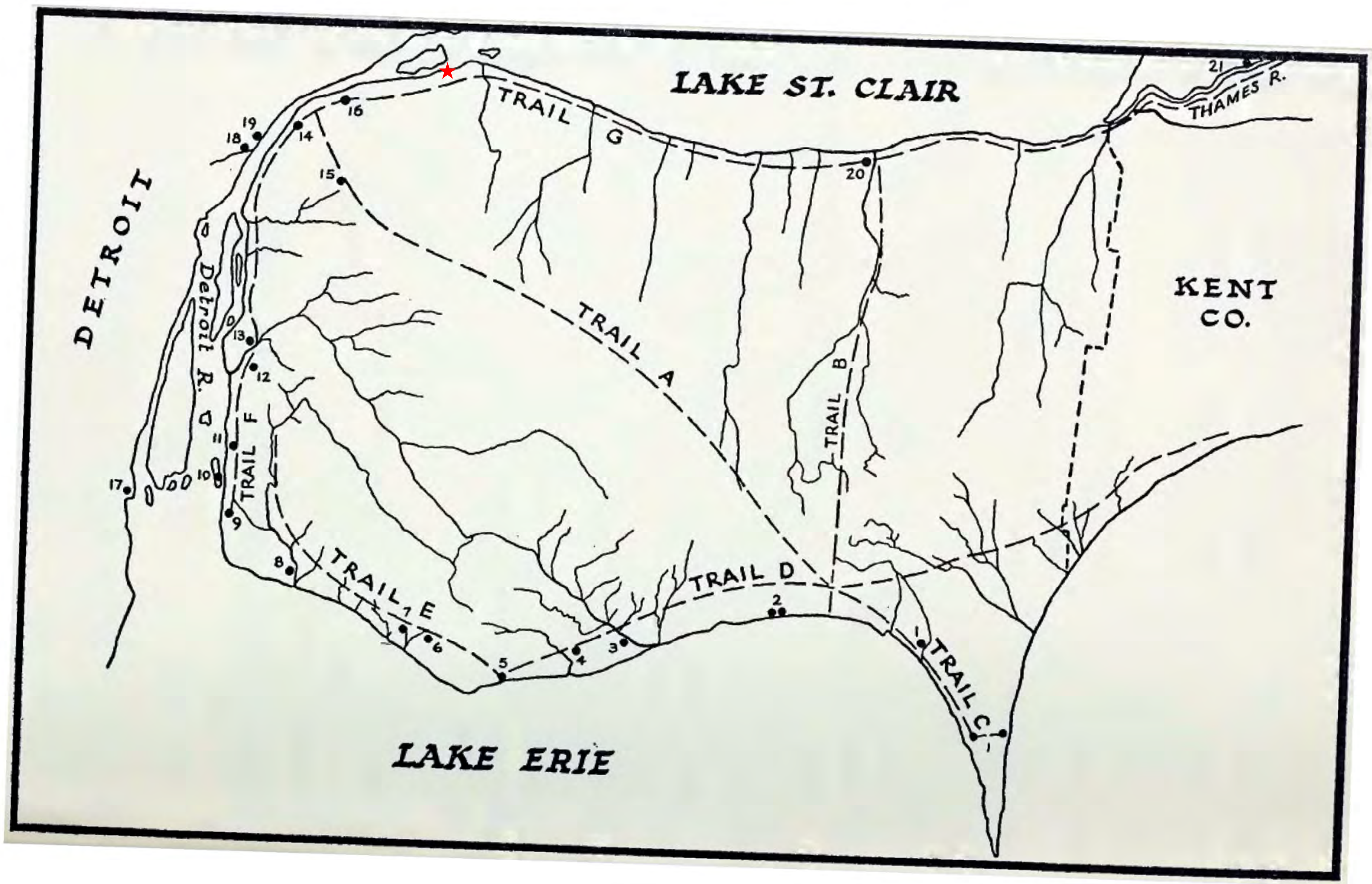

Stantec

Legend

★ Project Study Area (Approximate)

Figure Not to Scale

Notes
1. Reference: Lajeunesse, Ernest J. 1960. The Windsor Border Region: Canada's Southernmost Frontier. The Champlain Society. Toronto: University of Toronto Press.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
6

Title
Documented Indigenous Activity in Essex County

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Legend

Project Study Area (Approximate)

Figure Not to Scale

Notes

1. Reference: Iredell, Abraham. 1803. Sandwich. Map A35. Unpublished map, on file with the Ministry of Natural Resources Crown Land Survey Records Office, Peterborough, Ontario.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
7

Title
Portion of the 1803 Plan of a Portion of Sandwich Township

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Stantec

Legend

Project Study Area (Approximate)

Figure Not to Scale

Notes
1. Reference: Owen, W.F.W., Captain R.N. 1828 A Survey of the River Detroit: From Lake Erie to Lake St. Clair. J and C Walker. Library and Archives Canada.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
8

Title
Portion of the 1828 Historical Map of a Survey of the Detroit River

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Stantec

Legend

Project Study Area (Approximate)

Figure Not to Scale

Notes

1. Reference: Walling, H.F. 1877. Map of Essex County, Ontario. R.M. Tackabury.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
9

Title
Portion of the 1877 Historical Map of Essex County

\\ca0004-ppfss04\work group\01609\active\ Other PCs Active\656 - Windsor\165620239\03 data\gis cad\gis\mxds\Archaeology\report figures\Marine Assessment\165620239 Marine Overview Fig09 1877Historic.mxd Revised: 2022-02-02 By: bakaur

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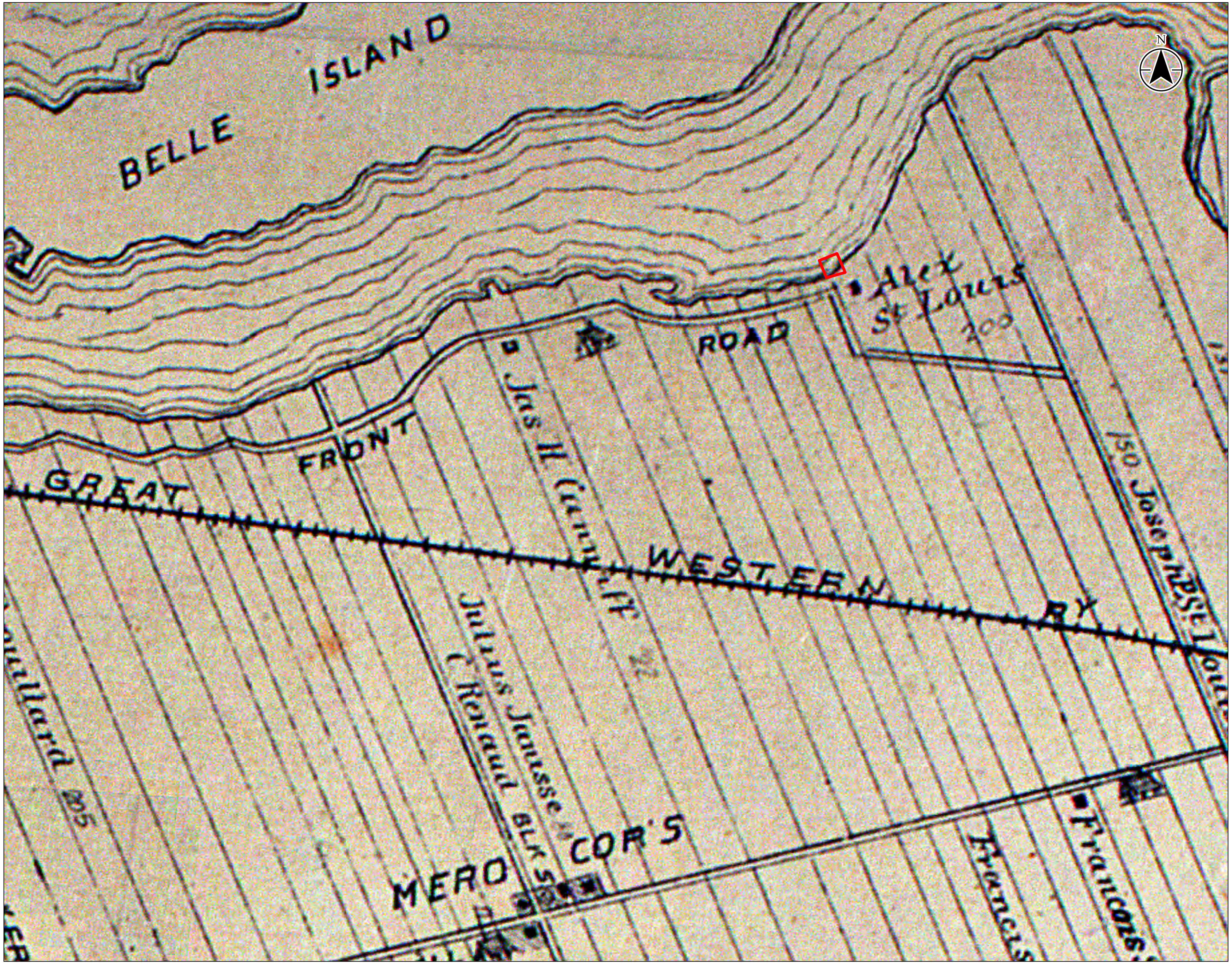

Stantec

Legend

Project Study Area (Approximate)

Figure Not to Scale

Notes

1. Reference: Belden, H. and Co. 1881. Essex Supplement in Illustrated Historical Atlas of the Dominion of Canada. Toronto: Belden and Co.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2021-10-22

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
10

Title
Portion of the 1881 Historical Map of Sandwich Township

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Stantec

Legend

Project Study Area (Approximate)

Figure Not to Scale

Notes
1. Reference:
(a) DTE Aerial Photo Collection at Wayne State University.
(b) Essex Region Conservation Authority Public Interactive Mapping

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
11-1

Title
Historical Aerial Photography -1931

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Stantec

Legend

Project Study Area (Approximate)

Figure Not to Scale

Notes
1. Reference:
(a) DTE Aerial Photo Collection at Wayne State University.
(b) Essex Region Conservation Authority Public Interactive Mapping

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
11-2

Title
Historical Aerial Photography -1949

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Stantec

Legend

Project Study Area (Approximate)

Figure Not to Scale

Notes
1. Reference:
(a) DTE Aerial Photo Collection at Wayne State University.
(b) Essex Region Conservation Authority Public Interactive Mapping

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
11-3

Title
Historical Aerial Photography -1952

\\ca0004-ppfss04\work_group\01609\active\Other_PCs_Active\656 - Windsor\165620239\03_data\gis_cad\gis\mxds\Archaeology\report_figures\Marine_Assessment\165620239_Marine_Overview_Fig11_Aerial_Historic.mxd Revised: 2022-02-02 By: bakaur

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Stantec

Legend

Project Study Area (Approximate)

Figure Not to Scale

Notes
1. Reference:
(a) DTE Aerial Photo Collection at Wayne State University.
(b) Essex Region Conservation Authority Public Interactive Mapping

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
11-4

Title
Historical Aerial Photography -1956

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Legend

Project Study Area (Approximate)

Figure Not to Scale

Notes
1. Reference:
(a) DTE Aerial Photo Collection at Wayne State University.
(b) Essex Region Conservation Authority Public Interactive Mapping

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
12-1

Title
Historical Aerial Photography -1961

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Legend

Project Study Area (Approximate)

Figure Not to Scale

Notes
1. Reference:
(a) DTE Aerial Photo Collection at Wayne State University.
(b) Essex Region Conservation Authority Public Interactive Mapping

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
12-2

Title
Historical Aerial Photography -1967

\\ca0004-ppfss04\work_group\01609\active_Other PCs_Active\656 - Windsor\165620239\03_data\gis_cad\gis\mxds\Archaeology\report_figures\Marine_Assessment\165620239_Marine_Overview_Fig12_Aerial_Historic.mxd Revised: 2022-02-02 By: bakaur

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Legend

Project Study Area (Approximate)

Figure Not to Scale

Notes

1. Reference:
(a) DTE Aerial Photo Collection at Wayne State University.
(b) Essex Region Conservation Authority Public Interactive Mapping

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
12-3

Title
Historical Aerial Photography -1981

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Stantec

Legend

Project Study Area (Approximate)

Figure Not to Scale

Notes
1. Reference:
(a) DTE Aerial Photo Collection at Wayne State University.
(b) Essex Region Conservation Authority Public Interactive Mapping

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
12-4

Title
Historical Aerial Photography -1997

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Stantec

Legend

Photo Location and Direction

Project Study Area

Assessment Method

Low to No Marine Archaeological Potential, No Further Archaeological Work Required

Previously Assessed (FAC 2020)

Previously Assessed (Stantec 2021)

0 10 20 m

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

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. Orthoimagery © First Base Solutions, 2021. Imagery Date, 2019.

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-02-02
Technical Review by SE on 2022-01-28

Client/Project
CITY OF WINDSOR
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT: MARINE ARCHAEOLOGICAL OVERVIEW ASSESSMENT

Figure No.
13

Title
Marine Archaeological Overview Assessment Results

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9.0 CLOSURE

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

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

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available and the results of the work. The conclusions are based on the conditions encountered by Stantec at the time the work was performed. Due to the nature of archaeological assessment, which consists of systematic sampling, Stantec does not warrant against undiscovered environmental liabilities or that the sampling results are indicative of the condition of the entire property.

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

Quality Review ___________________________________
(signature)

Tracie Carmichael – Managing Principal, Environmental Services

Independent Review________________________________
(signature)

Parker Dickson – Associate, Senior Archaeologist

APPENDIX D

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

Clear Form Print Form

Ontario

Ministry of Tourism,
Culture and Sport

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

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

A Checklist for the Non-Specialist

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

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

Processes covered under this checklist, such as:

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

Cultural Heritage Evaluation Report (CHER)

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

The CHER will help you:

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

Other checklists

Please use a separate checklist for your project, if:

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

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

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Project or Property Name

St. Rose Stormwater Pumping Station, Class Environmental Assessment - Schedule 'C'

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

St. Rose Beach Park, 6902 Riverside Drive East, Windsor, Ontario

Proponent Name

Corporation of the City of Windsor

Proponent Contact Information

Janelle Coombs (jcoombs@citywindsor.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

Instructions

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

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

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

In this context, the following definitions apply:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

i. designated under the *Ontario Heritage Act*

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

Individual Designation – Part IV

A property that is designated:

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

Heritage Conservation District – Part V

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

For more information on Parts IV and V, contact:

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

---

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

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

The primary purpose of the agreement is to:

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

For more information, contact:

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

---

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

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

Registers include:

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

For more information, contact:

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

---

iv. subject to a notice of:

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

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

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

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

For more information, contact:

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

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

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

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

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

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

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

For more information, see the National Historic Sites website.

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

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

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

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

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

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

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

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

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

See a directory of all federal heritage designations.

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

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

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

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

Part B: Screening for potential Cultural Heritage Value

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

Heritage resources are often recognized with formal plaques or markers.

Plaques are prepared by:

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

For more information, contact:

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

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

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

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

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

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

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

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

For more information, contact the Canadian Heritage River System.

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

- your conservation authority
- municipal staff

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

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

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

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

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

A building or structure can include:

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

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

Part C: Other Considerations

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

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

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

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

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

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

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

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

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

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

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

An internet search may find helpful resources, including:

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

Information specific to trails may be obtained through Ontario Trails.

APPENDIX D

Natural Heritage Impact Assessment Report

ENGINEERING SERVICES FOR ST. ROSE PUMPING STATION – NATURAL HERITAGE IMPACT ASSESSMENT

Final Report

November 2, 2022

Prepared for:
The City of Windsor

Prepared by:
Stantec Consulting Ltd

Project Number:
165620239

The conclusions in the Report titled Engineering Services for St. Rose Pumping Station – Natural Heritage Impact 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 document was published ando 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.

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1 Introduction

Stantec Consulting Ltd. (Stantec) was retained by the City of Windsor (the City) to complete a natural heritage impact assessment in support of the Schedule C Class Assessment for Engineering Services for the St. Rose Outlet Sewer and Pumping Station.

The City has experienced an increase in extreme storm events in recent years and also record high water levels in Lake St. Clair and the Detroit River. These climatic and hydrological factors have caused basement, coastal, and surface level flooding throughout the city and in surrounding municipalities. Coastal zones and low-lying areas, which includes the neighbourhood of Riverside and a majority of East Windsor, are at considerable risk for flood events, which can cause damage to municipal infrastructure, residential / commercial properties, and local transportation networks. To address widespread flooding issues during extreme storm events, the City completed a comprehensive Sewer & Coastal Flood Protection Master Plan (SMP) (City of Windsor 2020). The SMP identified the need for a new stormwater pumping station and new storm sewer outlet to the Detroit River to service the St. Rose drainage area.

The SMP recommended that the St. Rose Pumping Station be located in the St. Rose Beach Park greenspace on the north side of Riverside Drive East within the existing sheet pile / break wall area of the park (the Site). The Site location is shown on **Figure 1, Appendix A**. This location is close to the existing outfall and does not require displacement of any existing residences. This results in relatively straightforward means of construction and operation, low requirements and extent of maintenance, minimal time requirements for implementation, minimal disruption during construction, and should result in a low capital cost compared to other potential sites

For this natural heritage impact assessment, the Study Area includes all areas within 2 km from the Site as shown on **Figure 1**. The Aquatic Study Area includes the Detroit River up to 25 m from the shoreline as shown on **Figure 1** and **Figure 2, Appendix A**.

2 Methods

2.1 Background Data Collection Sources

The following background sources were reviewed to identify natural heritage features and constraints in the Study Area:

- Ministry of Natural Resources Forestry's (MNRF) Land Information Ontario (LIO) digital mapping of natural heritage features (MNRF 2022a)
- MNRF's Constructed Drains digital dataset (MNRF 2022b)
- City of Windsor Official Plan Volume 1 (City of Windsor 2013)
- Satellite imagery (Google Earth Pro 2022)
- Essex Region Conservation Authority (ERCA) Regulation Mapping (ERCA 2022)
- ERCA Regulatory Floodplain (ERCA 2022)

A list of species at risk (SAR) and species of conservation concern (SOCC) that may occur in the Study Area was prepared by reviewing the following sources:

- MNRF's Natural Heritage Information Centre (NHIC) Biodiversity Explorer database (MNRF 2022c)
- Fisheries and Oceans Canada's (DFO) Aquatic SAR Maps (DFO 2022a)
- Species at Risk in Ontario (SARO) List Schedule 2 & 3 (MECP 2022)
- *Species at Risk Act*, 2002 (SARA), Schedule 1 (Government of Canada 2022a)
- eBird online database of bird distribution and abundance (eBird 2022)
- Atlas of Mammals of Ontario (Dobbyn 1994)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2022)
- Ontario Breeding Bird Atlas (Cadman et al. 2007)
- Ontario Butterfly Atlas (TEA 2021)
- Ontario Odonata Atlas Database (Ontario Odonata Atlas 2022).

These resources generally do not provide specific locations of species; accuracy ranges from 1 km^2 (NHIC database) to 10 km^2 (wildlife atlases) or to municipal boundaries or watersheds. Results were screened to assess the relevance of records to the Study Area and species were removed from consideration if there was no suitable habitat in the Study Area (e.g., open water aquatic species).

For this report, SAR were defined as:

- Endangered and threatened species that are on the SARO List and protected by the provincial *Endangered Species Act,* 2007 (ESA)

- Endangered and threatened aquatic species and migratory birds that are listed on Schedule 1 of the federal SARA and protected by the SARA.

Non-aquatic species and non-migratory birds listed on Schedule 1 of SARA are excluded because protection under SARA is generally not provided outside of federal lands.

SOCC are defined as:

- Special concern species on the SARO List
- Species assessed as special concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) regardless of its listing on Schedule 1 of SARA
- Species with provincial ranks of S1 to S3.

Provincial ranks (S ranks) are used by the NHIC to set protection priorities for rare species and vegetation communities. They are based on the number of occurrences in Ontario and are not legal designations. Species with provincial ranks of S1 to S3 are tracked by the MNRF and considered SOCC. Provincial S ranks are defined as follows:

S1: Critically imperiled; usually fewer than 5 occurrences
S2: Imperiled; usually fewer than 20 occurrences
S3: Vulnerable; usually fewer than 100 occurrences
S4: Apparently secure; uncommon but not rare, usually more than 100 occurrences
S5: Secure, common, widespread and abundant.

2.2 Agency Consultation

Consultation with the agency responsible for provincially regulated SAR (i.e., the Ministry of the Environment, Conservation and Parks (MECP)) has moved to a proponent driven process; proponents are directed to review the background documentation and related information sources outlined above. As such, information requests were not submitted for provincially designated features, SOCC and/or SAR.

Municipal agencies have also placed data regarding natural heritage features and constraints on publicly accessible geoportals or web viewers and encourage proponents to complete their own background data reviews. The following data sources were reviewed:

- City of Windsor Official Plan Schedule ‘B’ – Greenway System (City of Windsor 2013)
- ERCA Regulation Mapping (ERCA 2021)

2.3 Field Investigations

Stantec completed site visits on October 15, 2021 to document existing natural heritage conditions in the Study Area. Surveys included Ecological Land Classification (ELC) of vegetation communities, a SAR habitat assessment of terrestrial features, and a fish habitat assessment of the Detroit River shoreline. The natural heritage features that were identified through the background review were also confirmed in the field. **Table 2.1** summarizes the field surveys completed.

Table 2.1: Field Survey Details – St. Rose Pumping Station

Purpose of Investigation	Date	Start/End Time (24 hours)	Weather Conditions	Biologists
• ELC • SAR Habitat Suitability Assessment • Fish Habitat Assessment	October 15, 2021	11:00 – 15:00	Temperature: 13°C Wind (km/hr): 19 Precipitation: 19.6 mm 24/hr Precipitation: 31mm*	Kayla Ellis / Marc Faiella

* Source: Climate data for NAVCAN Station 'Windsor A' - Government of Canada (2022b) Environmental Canada Historical Weather web application

2.3.1 Ecological Land Classification Assessment

Vegetation communities were initially characterized using aerial imagery. Vegetation was identified, and communities were then verified and assessed in the field. Community characterizations (ecosites and vegetation types) were based on the Ontario ELC system (Lee et al. 1998). Dominant vegetation species within each community were recorded. Common names and scientific nomenclature of the species observed followed the provincial *Ontario Species List - Vascular Plants* provided by the NHIC (MNRF 2022d). Provincial significance of vegetation communities and plant species was based on the rankings assigned by the NHIC (MNRF 2020c).

2.3.2 Species at Risk Habitat Suitability Assessment

A SAR habitat suitability assessment was completed in the Study Area. The assessment focused on identifying potential SAR habitat features (e.g., SAR bat maternity roost trees) or occurrences (e.g., butternut (*Juglans cinerea*)). SAR habitat suitability assessments were completed for species protected under the ESA that were identified in the NHIC database and Ontario wildlife atlases during the background review. If encountered, these features were recorded and assessed for potential use by SAR; wildlife species occurrences were observed by sight, sound and/or through distinctive signs (e.g., tracks, scat).

As the timing of the survey was outside of the wildlife active season and the presence of wildlife, specifically SAR (e.g., breeding birds), was anticipated to be limited, the ELC characterization of the Study Area was also used to assess habitat suitability for SAR.

2.3.3 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. Habitats of SOCC (excluding the habitats of Endangered or Threatened species)
4. Animal movement corridors.

Habitats within the Study Area were assessed for candidate SWH, as defined in the Ecoregion 7E-1 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 completed, identified SWH features were considered candidate, unless they were confirmed through direct observations or background review.

2.3.4 Fish Habitat Assessment

A fish habitat assessment was completed at the Site on October 15, 2021. The assessment was completed using a jon boat in the Detroit River within the aquatic Study Area (i.e., within 25 m from the shoreline). Sediment was collected using a Petite Ponar at several locations. Water depth was recorded at each location. Fish sampling was not completed as fish community data are available for the Detroit River. A photographic record was made of aquatic habitat conditions (**Appendix B**).

3 Results

3.1 Background Data Collection

3.1.1 Natural Heritage and Planning Documentation

Significant natural features were identified within the Study Area (MNRF 2021a). The Detroit River is within the Study Area and supports critical habitat for aquatic SAR (DFO 2022) (see **Figure 1**). Peche Island and other Provincially Significant Wetlands (PSW) are located over 2 km from the Site.

3.1.2 Species at Risk

There were 17 SAR identified in the 1 x 1 km NHIC squares that overlap the Study Area. Ten additional SAR with potential to be present in the Study Area were identified in the background review. A list of the SAR identified during the background review is provided in Error! Reference source not found..

Table 3.1: Records of SAR in the Vicinity of the St. Rose Pumping Station Study Area

Common Name	Latin Name	Provincial S-Rank	SARO Status	SARA Schedule 1
Birds				
Acadian Flycatcher[2]	*Empidonax virescens*	S1B	Endangered	Threatened
Barn Swallow[1,2,5]	*Hirundo rustica*	S4B	Threatened	Threatened
Bobolink[2]	*Dolichonyx oryzivorus*	S4B	Threatened	Threatened
Chimney Swift[2,5]	*Chaetura pelagica*	S3B	Threatened	Threatened
Eastern Meadowlark[1,2]	*Sturnella magna*	S4B, S3N	Threatened	Threatened
Mammals				
Eastern Small-footed Myotis[8]	*Myotis leibii*	S2S3	Endangered	
Little Brown Myotis[6]	*Myotis lucifugus*	S3	Endangered	Endangered
Northern Myotis[8]	*Myotis septentrionalis*	S3	Endangered	Endangered
Tricolored Bat[8]	*Perimyotis subflavus*	S3?	Endangered	Endangered
Reptiles				
Blanding's Turtle[3]	*Emydoidea blandingii*	S3	Threatened	Endangered
Butler's Gartersnake[1,3]	*Thamnophis butleri*	S2	Endangered	Endangered
Five-lined Skink (Carolinian population) [3]	*Plestiodon fasciatus pop. 1*	S3	Endangered	Endangered

Table 3.1: Records of SAR in the Vicinity of the St. Rose Pumping Station Study Area

Common Name	Latin Name	Provincial S-Rank	SARO Status	SARA Schedule 1
Eastern Foxsnake (Carolinian population) [3]	*Pantherophis vulpinus pop. 2*	S2	Endangered	Endangered
Spiny Softshell[1]	*Apalone spinifera*	S2	Endangered	Endangered
Plants				
Butternut[1]	*Juglans cinerea*	S2?	Endangered	Endangered
Aquatic Species				
Eastern Pondmussel[1]	*Ligumia nasuta*	S1	Endangered	Special Concern
Eastern Sand Darter[1]	*Ammocrypta pellucida*	S2	Endangered	Threatened
Fawnsfoot[1]	*Truncilla donaciformis*	S1	Endangered	Endangered
Kidneyshell[1]	*Ptychobranchus fasciolaris*	S1	Endangered	Endangered
Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)[1]	*Acipenser fulvescens pop. 3*	S2	Threatened	
Mapleleaf Mussel[1]	*Quadrula quadrula*	S2	Threatened	Special Concern
Northern Madtom[1]	*Noturus stigmosus*	S1	Endangered	Endangered
Northern Riffleshell[1]	*Epioblasma rangiana*	S1	Endangered	Endangered
Pugnose Shiner[1]	*Notropis anogenus*	S2	Threatened	Threatened
Round Hickorynut[1]	*Obovaria subrotunda*	S1	Endangered	Endangered
Round Pigtoe[1]	*Pleurobema sintoxia*	S1	Endangered	Endangered
Snuffbox[1]	*Epioblasma triquetra*	S1	Endangered	Endangered

[1] NHIC Database (MNRF 2021b)
[2] Ontario Breeding Bird Atlas (Cadman et. al., 2007)
[3] Ontario Reptile and Amphibian Atlas (Ontario Nature 2022)
[4] Ontario Butterfly Atlas (TEA 2021)
[5] eBird Database (eBird 2022)
[6] Atlas of the Mammals of Ontario (Dobbyn 1994)
[7] Ontario Odonata Atlas Database (Ontario Odonata Atlas 2022)
[8] Species at Risk in Ontario List (MECP 2022)
[9] iNaturalist (iNat 2022)

3.1.3 Species of Conservation Concern

There were 14 SOCC identified in the 1 x 1 km NHIC squares that overlap with the Study Area.

A review of species databases found 15 additional SOCC that have been previously documented or have the potential to occur within the Study Area. A list of the SOCC identified during the background review is provided in Error! Reference source not found..

Table 3.2: Recent records of SOCC (1990 – present) in the Vicinity of the St. Rose Pumping Station Study Area

Common Name	Latin Name	Provincial S-Rank	SARO Status	SARA Schedule 1
Birds				
Bald Eagle[1,2]	*Haliaeetus leucocephalus*	S4	Special Concern	
Canvasback[9]	*Aythya valisineria*	S1B, S3N, S4M		
Common Nighthawk[2]	*Chordeiles minor*	S4B	Special Concern	Threatened
Eastern Wood-pewee[2]	*Contopus virens*	S4B	Special Concern	Special Concern
Horned Grebe[9]	*Podiceps auratus*	S1B, S3N, S4M	Special Concern	Special Concern
Peregrine Falcon[2]	*Falco peregrinus*	S4	Special Concern	
Redhead[9]	*Aythya americana*	S2B, S4N, S4M		
Red-headed Woodpecker[2]	*Melanerpes erythrocephalus*	S3	Special Concern	Endangered
Short-eared Owl[2]	*Asio flammeus*	S4?B, S2S3N	Special Concern	Special Concern
Wood Thrush[2]	*Hylocichla mustelina*	S4B	Special Concern	Threatened
Reptiles				
Midland Painted Turtle[1,3]	*Chrysemys picta marginata*	S4		Special Concern
Northern Map Turtle[1,3,9]	*Graptemys geographica*	S3	Special Concern	Special Concern
Snapping Turtle[1,3]	*Chelydra serpentina*	S4	Special Concern	Special Concern
Plants				
Climbing Prairie Rose[1]	*Rosa setigera*	S2S3	Special Concern	Special Concern
Early-branching Panicgrass[1]	*Dichanthelium praecocius*	S3		
Prairie Straw Sedge[1]	*Carex suberecta*	S2		
Shrubby St. John's-wort[9]	*Hypericum prolificum*	S2		

Table 3.2: Recent records of SOCC (1990 – present) in the Vicinity of the St. Rose Pumping Station Study Area

Common Name	Latin Name	Provincial S-Rank	SARO Status	SARA Schedule 1
Aquatic Species				
Brindled Madtom[1]	*Noturus miurus*	S2	Not at Risk	
Channel Darter[1]	*Percina copelandi*	S3	Special Concern	Threatened`
Chestnut Lamprey (Great Lakes - Upper St. Lawrence populations[1])	*Ichthyomyzon castaneus pop. 1*	SU	Data Deficient	
Purple Wartyback[1]	*Cyclonaias tuberculate*	S2		
Silver Lamprey (Great Lakes - Upper St. Lawrence populations)[1]	*Ichthyomyzon unicuspis pop. 1*	S3	Special Concern	Special Concern
Insects				
American Bumble Bee[1]	*Bombus pensylvanicus*	S3S4		
Black Dash[4]	*Euphyes conspicua*	S3		
Duke's Skipper[4]	*Euphyes dukesi*	S2		
Elusive Clubtail[1,7]	*Stylurus notatus*	S3		
Hoary Edge[4]	*Achalarus lyciades*	S1		
Monarch[4]	*Danaus plexippus*	S2N, S4B	Special Concern	Special Concern
Sleepy Duskywing[4]	*Erynnis brizo*	S1		
Southern Cloudywing[4]	*Thorybes bathyllus*	S3		
Zabulon Skipper[4]	*Poanes zabulon*	S1		
Great Spreadwing[7]	*Archilestes grandis*	S1		
Swamp Darner[7]	*Epiaeschna heros*	S3S4		
Jumping Bristletail[9]	*Pedetontus saltator*	S1		

[1] NHIC Database (MNRF 2021b)
[2] Ontario Breeding Bird Atlas (Cadman et. al., 2007)
[3] Ontario Reptile and Amphibian Atlas (Ontario Nature 2022)
[4] Ontario Butterfly Atlas (TEA 2021)
[5] eBird Database (eBird 2022)
[6] Atlas of the Mammals of Ontario (Dobbyn 1994)
[7] Ontario Odonata Atlas Database (Ontario Odonata Atlas 2021)
[8] Species at Risk in Ontario List (MECP 2022)
[9] iNaturalist (iNat 2022)

3.1.4 Fish and Fish Habitat

The Study Area includes the Detroit River. As a major watercourse that connects Lake St. Clair with Lake Huron, this river provides habitat for a diverse fish community. As many as 139 native species have been documented in the Great Lakes by the Great Lakes Fishery Commission (GLFC 2022). At least 34 non-native fish species are present in the Great Lakes, including Round Goby and Sea Lamprey (GLFC 2022).

As many as 60 fish species were captured in the Detroit River between 2007 and 2103 by Fisheries and Oceans Canada (Kindree & Mandrak 2020). The Detroit River supports habitat for numerous aquatic SAR, including Lake Sturgeon, Eastern Sand Darter and several freshwater mussel species (see **Section 3.1.2** and **3.1.3**). Critical habitat for an aquatic SAR, Northern Madtom, is mapped within the Study Area (DFO 2022).

The habitat preferences of this species are described by Scott & Crossman (1998) as follows:

"*The Northern madtom usually lives in large creeks and rivers with a moderate to swift current, and a sand, gravel, or mud bottom. This fish has also been captured in the deeper waters of Lake St. Clair and the Detroit River. It prefers clean, unpolluted water but can tolerate slightly muddy water.*"

There are no other watercourses or constructed drains in the aquatic Study Area (MNRF 2022a; MNRF 2022b).

3.2 Field Investigations

3.2.1 Ecological Land Classification

The Study Area is comprised of parkland and aquatic habitat. Descriptions of vegetation communities identified in the Study Area are in **Table 3.3**. Vegetation communities located within the Study Area are shown on **Figure 2**, **Appendix A**.

Table 3.3: ELC Types in the St. Rose Pumping Station Study Area

ELC Type	Community Description
Aquatic System (AQ)	
Open Water (OA)	Aquatic system defined by depth > 2 m.
Submerged Shallow Aquatic (SAS)	Shallow aquatic system with a mix of submerged species. Species composition characterized by American Eelgrass (*Vallisneria americana*) with Flat-stemmed Pondweed (*Potamogeton zosteriformis*) and Curly-leaved Pondweed (*Potamogeton crispus*) to a lesser extent.
Constructed (CV)	
Greenlands (CGL)	
Recreational (CGL_4)	Parkland with artificial shoreline composed of cobble, boulders, cement. Grass is maintained.

3.2.2 Fish Habitat Assessment

The Study Area for aquatic habitat investigations includes areas within 25 m from the Detroit River shoreline. The Detroit River is a large waterbody and the shoreline is exposed to the forces of wind, waves and ice movement. Within the Study Area the shoreline is entirely constructed with steel sheet piles with a concrete walkway. To the west of the Study Area there is a gradual beach with coarse substrates (i.e., cobbles and sand). A photographic record of the Study Area is included in **Appendix B**.

The average water depth within the Study Area was 1.5 m. Maximum depth observed was 2.5 m. Substrate in most (80-90%) of the areas consisted of a mixture of sand and silt. Coarser substrates including gravel, cobble and boulders were observed along the shoreline. The substrates composition in the Study Area is listed in **Table 2.1** and shown on **Figure 2, Appendix A**.

Table 3.4: Substrate Composition in the Aquatic Portion of the St. Rose Pumping Station Study Area

Substate Type	Percent Area Coverage
Sand/ Silt	80 - 90%
Cobble/ Gravel	5 - 10 %
Cobble/ Boulder	5 - 10 %
Boulder	< 1 %

Submergent aquatic macrophyte growth (i.e., Slender Leaf Pondweed (*Potamogeton pusillus*)) was observed throughout the Study Area with larger densities observed in the deeper areas (see **Photo 6, Appendix B**).

4 Assessment of Significance

4.1 Ecological Land Classification

All of the ELC vegetation communities identified in the Study Area are common in southern Ontario.

4.2 Species at Risk Habitat Suitability Assessment

Potential habitat was identified in the Study Area during the SAR habitat assessment for one of the provincially threatened and endangered species identified in the background review (i.e., Barn Swallow). The SAR habitat assessment and potential presence of each species is discussed in **Table 4.1**.

Table 4.1: SAR Habitat Suitability Assessment in the St. Rose Pumping Station Study Area

Species	Habitat Description	Assessment Results
Butternut	Grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows.	**ABSENT** – No Butternuts were identified in the Study Area during the field investigation.
Acadian Flycatcher	Its preferred breeding habitat generally consists of large mature forests and deeply wooded ravines (Friesen and Stabb 2001). A minimum of 30 ha of suitable habitat are required. Acadian Flycatchers generally prefer large tracts of undisturbed forest and in Ontario, the species often breeds in black ash swamps (Whitehead and Taylor 2002).	**ABSENT** – There were no suitable mature forests idenitified in the Study Area that would support Acadian Flycatcher.
Barn Swallow	The Barn Swallow commonly nests on walls or ledges of barns, bridges, culverts or other man-made structures.	**CANDIDATE** – The artificial shoreline may provide suitable nesting habitat. Investigations recommended during the breeding bird season.
Bobolink	Nests primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures. Bobolink is an area-sensitive species, with reported lower reproductive success in small habitat fragments.	**ABSENT** – The parkland in the Study Area does not support Bobolink.
Chimney Swift	Chimney Swift uses chimneys for roosting and breeding, and less commonly, nest in large hollow trees.	**ABSENT** – There were no chimney structures identified in the Study Area and there were no suitable cavity trees that would provide suitable habitat for Chimney Swifts.
Eastern Meadowlark	Prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	**ABSENT** – The parkland in the Study Area does not support Eastern Meadowlark.

Table 4.1: SAR Habitat Suitability Assessment in the St. Rose Pumping Station Study Area

Species	Habitat Description	Assessment Results
Myotis sp. (Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis) and Tri-colored Bat	Maternity roosts are in cavity trees and under loose bark. The trees located within the park may have the potential to provide habitat for roosting endangered bats.	**ABSENT** – There were no suitable cavity trees idenitified in the Study Area that would provide suitable habitat for bat maternity roosts.
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).	**ABSENT** – No suitable habitat identified in the Study Area during the field investigation.
Butler's Gartersnake	This species is typically found in open areas such as grasslands, old fields, tall-grass prairie habitats, urban, industrial, and disturbed sites, typically in proximity to wet areas such as seasonal marshes, swales, and small waterbodies (ECCC 2018). Butler's Gartersnakes hibernate from mid-September until early April, typically near wetland or open water within crayfish or small mammal burrows, drains, log piles, and other underground sites (ECCC 2018). In Ontario, this species is found in three areas: scattered populations within 10 km of the Detroit River, Lake St. Clair, the St. Clair River, and Lake Huron in Essex and Lambton counties; Skunk's Misery, in Middlesex and Lambton counties; and Luther Marsh, in Dufferin and Wellington counties. Although its distribution is limited, the species is frequently locally abundant where it does occur (COSEWIC 2010).	**ABSENT** – The Study Area is adjacent to the Detroit River; however, the artificial shoreline does not provide suitable hibernaculum.
Five-lined Skink (Carolinian population)	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).	**ABSENT** – The parkland in the Study Area does not support Five-lined Skink.

Table 4.1: SAR Habitat Suitability Assessment in the St. Rose Pumping Station Study Area

Species	Habitat Description	Assessment Results
Eastern Foxsnake (Carolinian population)	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).	**PRESENT**– The Study Area is adjacent to the Detroit River; however, the artificial shoreline does not provide suitable hibernaculum. The rocks/boulders in the north-east corner of the Study Area, however, may be used by Eastern Foxsnake for thermoregulation.
Spiny Softshell	Spiny Softshell Sub-populations in Ontario occur in the east, associated with the Ottawa and St. Lawrence River, and south, associated with Lake Erie, especially the Sydenham and Thames Rivers (COSEWIC 2002). Spiny softshells require sandy beaches and riverbanks for nesting, shallow soft-bottomed water bodies to function as nurseries and refugia, basking areas and deep pools for thermoregulation, and riffle areas for foraging, habitat features may occur over a large area, as long as the intervening habitat doesn't prevent the turtles from travelling between them (COSEWIC 2002).	**ABSENT** – No suitable habitat identified in the Study Area during the field investigation.
Eastern Pondmussel	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.	**ABSENT** – Eastern Pondmussel has been extirpated from the main channel of the Detroit River (Schloesser etal 2006).
Eastern Sand Darter	The fish favours sandy bottoms of streams and rivers and sandy shoals in lakes. It frequents water over limestone bottoms covered with a thin layer of mud, riffles over rubble and gravel, and silted sand bottoms. The water can be clear, tea-coloured or murky. Currents can range from still to swift.	**ABSENT** – The silt and sand mix bottom found in the Study Area is not the preferred substrate for this species.
Fawnsfoot	Known to occur in areas of moderate to low flows in medium to large rivers at depths ranging from less than 1 m to greater than 5 m but can adapt to low flow environments such as lakes and reservoirs. The Fawnsfoot is usually associated with substrates of sand or mud but can also utilize coarser substrates.	**ABSENT** – Fawnsfoot has been extirpated from the main channel of the Detroit River (Schloesser etal 2006).

Table 4.1: SAR Habitat Suitability Assessment in the St. Rose Pumping Station Study Area

Species	Habitat Description	Assessment Results
Kidneyshell	The Kidneyshell is most often found in small to medium-sized rivers and streams, where it prefers shallow areas with clear, swift-flowing water and substrates of firmly packed coarse gravel and sand. It is rarely found in either large rivers or headwater creeks but has been found on gravel shoals in Lake Erie and Lake St. Clair. It is often found near beds of Water Willow, an aquatic plant. It is usually found deeply buried in the substrate.	**ABSENT** – Kidneyshell has been extirpated from the main channel of the Detroit River (Schloesser etal 2006).
Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Lake Sturgeon are bottom-dwelling fish found in large rivers and lakes, at depths generally between 5 and 10 m, sometimes greater. Spawning occurs in the spring in fast-flowing water at depths between 0.6 and 5 m over hard-pan clay, sand, gravel and boulders.	**ABSENT** – Lake Sturgeon is found at greater depths except when spawning. The aquatic and shoreline habitat in the Study Area does not provide fast flowing habitat required for spawning.
Mapleleaf Mussel	Mapleleaf generally inhabit medium to large rivers and reservoirs where currents are slow to moderate in soft or course substrates (Metcalfe-Smith et al. 2012).	**ABSENT** – Mapleleaf Mussel has been extirpated from the main channel of the Detroit River (Schloesser etal 2006).
Northern Madtom	The Northern Madtom prefers habitats ranging from large creeks to big rivers, with clear to turbid water, and moderate to swift current. The fish occurs on bottoms of sand, gravel, and stones, occasionally with silt, detritus, and accumulated debris. It is sometimes associated with large aquatic plants, and is typically collected at depths of less than 7 m.	**ABSENT** – Although this species has been documented in the American waters of the Detroit River it prefers the warm shallows. The contructed sheetpile shoreline does not provide suitable conditions for warm shallows.
Northern Riffleshell	As its name would suggest, the Northern Riffleshell is a mussel that lives mainly in highly oxygenated riffle areas of various sized watercourses. Historically, it had a much greater range, including shoals in western Lake Erie and Lake St. Clair, where wave action was sufficient to produce continuously moving water. The Northern Riffleshell prefers to live in areas where substrates range from rocky, sandy bottoms, to firmly packed sand and fine to coarse gravel (Environment Canada 2008).	**ABSENT** – Northern Riffleshell has been extirpated from the main channel of the Detroit River (Schloesser etal 2006).

Table 4.1: SAR Habitat Suitability Assessment in the St. Rose Pumping Station Study Area

Species	Habitat Description	Assessment Results
Pugnose Shiner	The strict habitat requirements of the Pugnose Shiner make it a good indicator of environmental quality. It requires areas of quiet, clear water with abundant vegetation and sand, silt, or clay bottoms. In Ontario, it has been found in large lakes, stagnant channels, and large rivers — primarily on sand bottoms with a lot of decomposing organic matter.	**ABSENT** – No suitable habitat identified in the Study Area during the field investigation.
Round Hickorynut	The preferred habitat of the Round Hickorynut is generally described as freshwater with steady, moderate flows and sand and gravel bottoms, at depths of up to 2 m. In southeastern Michigan and southwestern Ontario, however, it has mainly been found in murky, low-gradient rivers with clay/sand or clay/gravel substrates. In Lake St. Clair, it currently occupies shallow (<1 m) nearshore areas with firm, sandy substrates.	**ABSENT** – Round Hickorynut has been extirpated from the main channel of the Detroit River (Schloesser etal 2006).
Round Pigtoe	In small rivers, this species can be found in areas of moderate flow on substrates of gravel, cobble and boulder. In larger rivers, it is found in mud, sand and gravel at varying depths.	**ABSENT** – Round Pigtoe has been extirpated from the main channel of the Detroit River (Schloesser etal 2006).
Snuffbox	The Snuffbox is typically found in small to medium-sized rivers in shallow riffle areas with clean, clear, swift-flowing water and firm rubble/gravel/sand substrates that are free of silt.	**ABSENT** – Snuffbox has been extirpated from the main channel of the Detroit River (Schloesser etal 2006).

4.3 Significant Wildlife Habitat

Each of the four categories of SWH are briefly described below in the context of the Study Area.

4.3.1 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. Examples include deer yards, snake and bat hibernacula, waterfowl staging and molting areas, raptor roosts, bird nesting colonies, shorebird staging areas, and passerine migration concentrations. Only the best examples of these concentration areas are usually designated as SWH.

4.3.2 Rare or Specialized Habitat

Rare or specialized habitats are two separate components of SWH. Rare habitats are those with vegetation communities that are considered rare in the province. Specialized habitats are microhabitats that are critical to some wildlife species. The SWHTG (MNR 2000) identifies habitats that could be considered specialized habitats, such as habitat for area-sensitive species, forests providing a high diversity of habitats, amphibian woodland breeding ponds, turtle nesting habitat, highly diverse sites, seeps, and springs. High quality habitat features generally occur outside of the influence of edge effects and wildlife mortality that are associated with major roadways.

4.3.3 Habitat for Species of Conservation Concern

Data from the field site visit were used to assess the potential for habitat of SOCC to occur within the Study Area. Habitat assessments for these species were completed through a combination of satellite photo interpretation and field investigations to determine whether suitable habitat may be present in the right-of way.

No suitable habitat was identified in the Study Area during the SOCC habitat assessment for any of the SOCC species identified in the Study Area during the background review. The SOCC habitat assessment and potential presence of each species is discussed in **Table 4.2**.

Table 4.2: SOCC Habitat Suitability Assessment in the St. Rose Pumping Station Study Area

Species	Habitat Description	Assessment Results
Bald Eagle	The Bald Eagle almost always nests near water, usually on large lakes. Large stick nests are placed in trees located within mature woodlots. They usually prefer 250 ha of mature forest for breeding, however, along Lake Erie, where the lake provides a valuable food source, the eagles will nest in smaller woodlots or even single trees (Sandilands 2005).	**ABSENT** – No suitable forest habitat identified in the Study Area during the field investigation.
Canvasback	Prefers small lakes, ponds, or marshes with ample emergent vegetation for nesting and an abundance of submergent vegetation (either Sago Pondweed or Wild Celery) for feeding. Remains a very rare breeder in Ontario, at the extreme eastern edge of its range (Cadman et al. 2007)	**ABSENT** – The Study Area contains an abundance of submergent vegetation including Wild Celery; however, there is no emergent vegetation present. Suitable migration habitat only.
Common Nighthawk	Prefers open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks.	**ABSENT** – No suitable vegetation-free habitats identified in the Study Area during the field investigation

Table 4.2: SOCC Habitat Suitability Assessment in the St. Rose Pumping Station Study Area

Species	Habitat Description	Assessment Results
Eastern Wood-Pewee	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.	**ABSENT** – No suitable forest habitat identified in the Study Area during the field investigation.
Horned Grebe	Horned Grebes generally breeds in freshwater and occasionally in brackish water on small semi-permanent or permanent ponds, but it also uses marshes and shallow bays on lake borders. Breeding areas require open water rich in emerging vegetation, which provides nest materials, concealment and anchorage, and protection for the young (COSEWIC 2009).	**ABSENT** – No adequate ponds, marshes, bays or wetlands present. Suitable migration habitat only.
Peregrine Falcon	Traditionally, in Ontario, it has been a rare breeder, preferring suitable rock cliffs, particularly those adjacent to water. More recently the species has been released in various urban centers in Ontario where it successfully nests on tall buildings. Relatively recent increases in abundance and distribution are owing to now established populations in natural areas and urban environments, both of which are separate and distinct populations. These increases reflect the large-scale recovery efforts across the species range (Cadman et al. 2007).	**ABSENT** – No suitable rock cliffs or buildings identified in the Study Area during the field investigation.
Redhead	Redheads breed mainly in the seasonal ponds and other wetlands (Cadman et al. 2007).	**ABSENT** – No seasonal ponds or wetlands present. Suitable migration habitat only.
Red-headed Woodpecker	Prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks.	**ABSENT** – No suitable forest habitat identified in the Study Area during the field investigation.
Short-eared Owl	These owls inhabit open habitats such as agricultural lands, wetlands, and grasslands. This area sensitive species nests on the ground usually in tall vegetation and typically prefers 75 ha of suitable habitat in order for nesting to occur. Breeding area on any given year is strongly correlated to small rodent abundances (Clark 1975).	**ABSENT** – No suitable open habitat identified in the Study Area during the field investigation.

Table 4.2: SOCC Habitat Suitability Assessment in the St. Rose Pumping Station Study Area

Species	Habitat Description	Assessment Results
Wood Thrush	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.	**ABSENT** – No suitable forest habitat identified in the Study Area during the field investigation.
Midland Painted Turtle	Painted turtles inhabit waterbodies, such as ponds, marshes, lakes and slow-moving creeks, that have a soft bottom and provide abundant basking sites and aquatic vegetation. These turtles often bask on shorelines or on logs and rocks that protrude from the water. The midland painted turtle hibernates on the bottom of waterbodies (Ontario Nature 2022).	**ABSENT** – No suitable waterbodies identified in the Study Area during the field investigation.
Northern Map Turtle	Inhabits both lakes and rivers, showing a preference for slow moving currents, muddy bottoms, and abundant aquatic vegetation. These turtles need suitable basking sites (such as rocks and logs) and exposure to the sun for at least part of the day.	**ABSENT** – Detroit River may act as a movement corridor for Map Turtle.
Snapping Turtle	Inhabits 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.	**ABSENT** – Detroit River does not provide shallow water with an abundance of soft mud.
Climbing Prairie Rose	Climbing Prairie rose occurs only in close proximity to the great lakes, primarily in Essex County, with additional populations in Chatham-Kent, Lambton County, and Middlesex County. It colonizes open habitats including agricultural land and unoccupied urban habitat, showing a preference for those with moist heavier soils (COSEWIC 2003).	**ABSENT** – No individuals were identified in the Study Area during the field investigation.
Early-branching Panicgrass	Dry open, usually sandy ground; prairies, open oak savannas, borders and fields (Rezniek et al. 2011).	**ABSENT** – No individuals were identified in the Study Area during the field investigation.
Prairie Straw Sedge	Fens; calcareous sedge meadows, lake shores, and wet prairies, very local (Rezniek et al. 2011).	**ABSENT** – No individuals were identified in the Study Area during the field investigation.
Shrubby St. John's-wort	Swamp borders, thickets, meadows, fields, roadsides, sandy open forests (oak); in drier sites generally *than Hypericum kalmianum*, often in successional shrubby fields (Rezniek et al. 2011).	**ABSENT** – No suitable habitat identified in the Study Area during the field investigation.

Table 4.2: SOCC Habitat Suitability Assessment in the St. Rose Pumping Station Study Area

Species	Habitat Description	Assessment Results
American Bumble Bee	The American Bumblebee occurs in a range of open habitats including farmlands, meadows and grasslands. It predominantly nests above ground in dense mats of long grass, but is also known to opportunistically nest in abandoned rodent burrows and abandoned bird nests well above the ground surface (COSEWIC 2018).	**ABSENT** – No suitable habitat identified in the Study Area during the field investigation.
Black Dash	Boggy marshes, wet meadows, and marshy stream banks (Lotts and Naberhaus 2017).	**ABSENT** – No suitable habitat identified in the Study Area during the field investigation.
Duke's Skipper	The Duke's Skipper inhabits woodland clearings, forest edges, ditches and along riverbanks, most important foodplants include Shoreline Sedge (*Carex hyalinolepis*) and Lake Sedge (*Carex lacustris*) (Hall 2014).	**ABSENT** – No suitable habitat identified in the Study Area during the field investigation.
Elusive Clubtail	The Elusive Clubtail often likes large rivers and large lakes with sandy bottoms, sometimes also with silt and gravel (WATRI 2021).	**ABSENT** – The landscaped conditions and contructed sheetpile shoreline does not provide suitable conditions for this species which spends most of it’s time on open water or perched in tree tops.
Hoary Edge	The Hoary Edge inhabits open, dry, sandy woodlands (Hall 2014).	**ABSENT** – No suitable woodland habitat identified in the Study Area during the field investigation.
Monarch	Exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	**ABSENT** – No suitable meadow habitat with abundance of Common Milkweed identified in the Study Area during the field investigation.
Sleepy Duskywing	Sleepy Duskywing (*Erynnis brizo*) Larvae can be found in leaf-nests in species of oak; adults occur in oak woods and can be seen on flowers or in mud puddles (Layberry et al. 1998).	**ABSENT** – No suitable woodland habitat identified in the Study Area during the field investigation.
Southern Cloudywing	The Southern Cloudywing inhabits open, dry areas, restricted to southwestern Ontario (Hall 2014).	**ABSENT** – No suitable habitat identified in the Study Area during the field investigation.
Zabulon Skipper	The Zabulon Skipper occurs in second-growth, woodland clearings, roadsides, parks and gardens. It is a rare resident breeding on Pelee Island, and has been reported twice within the Ojibway Prairie in Windsor (Hall et al. 2014).	**ABSENT** – No suitable habitat identified in the Study Area during the field investigation.
Great Spreadwing	The Great Spreadwing prefers slow small streams, often with alder or willows, wetlands, ponds and temporary pools (WATRI 2021).	**ABSENT** – No suitable wetland habitat identified in the Study Area during the field investigation.

Table 4.2: SOCC Habitat Suitability Assessment in the St. Rose Pumping Station Study Area

Species	Habitat Description	Assessment Results
Swamp Darner	Swamp Darners (*Epiaeschna heros*) can be found near forest pools, ponds and ditches (Caitling and Brownell 2000)	**ABSENT** – No suitable wetland habitat identified in the Study Area during the field investigation.
Jumping Bristletail	The Jumping Bristletail occurs in crevices in limestone cliffs, on boulders, leaf litter between boulders, in old stone walls (from close to the surface to at least 2 feet (0.6 m) below the top of the stone wall) (Wygodzinsky and Schmidt 1980).	**ABSENT** – No suitable wetland habitat identified in the Study Area during the field investigation. The stones situated along the parkland are unlikely to provide suitable habitat as this species requires terrestrial subterranean habitat.
Brindled Madtom	The Brindled Madtom lives on bottoms of sand, gravel, and wood debris in the warm shallows of slow moving streams.	**ABSENT** –The contructed sheetpile shoreline does not provide suitable conditions preferred by this species i.e. warm shallows.
Channel Darter	The Channel Darter may inhabit smaller channels and tributaries, but is found most frequently in larger river systems. The fish may stay in water over 1 m deep during the day, and move to very shallow areas at night. It is commonly found over sand and gravel shoals of larger rivers or beaches, where the current is slow. In rivers, the Channel Darter inhabits deeper pools or sluggish riffles where there is sufficient current to keep the gravel bottom free of silt. It migrates to moderate or fast-flowing riffles for spawning. In Ontario streams, Channel Darter habitat has been characterized as rock, sand, and rubble bottoms in water over 1 m deep, with slow to sluggish flow.	**ABSENT** –The contructed sheetpile shoreline does not provide suitable conditions preferred by this species (i.e. warm shallows).
Chestnut Lamprey - Great Lakes - Upper St. Lawrence populations	The Chestnut Lamprey lives its entire life in coolwater streams, mostly as an ammocoete buried in soft bottoms of silt and sand.(Holm et al. 2022).	**ABSENT** –The Detroit River does not provide the coolwater conditions preferreed by this species.
Purple Wartyback	The species occupies small to large rivers with a range of flow conditions and favours a substrate comprised of cobble, gravel, and sand.	**ABSENT** – Purple Wartyback is believed to be extirpated from its historical distribution in the Detroit River and Lake Erie (Government of Canada website 2022).
Silver Lamprey (Great Lakes - Upper St. Lawrence populations)	Adults live primarily in the cool waters of lakes. Ammocoete spend most of their lives in streams, buried in soft bottoms of silt and sand (Holm et al. 2022). The Silver Lamprey inhabits larger rivers and lakes	**ABSENT** –The nearshore areas of the Detroit River does not provide the coolwater conditions preferred by this species.

4.3.4 Animal Movement Corridors

Migration corridors are areas that are traditionally used by wildlife to move from one habitat to 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. This corridor is identified after amphibian breeding habitat (woodlands) areas are confirmed. Amphibian breeding surveys were not conducted for the Project and are beyond the scope of this assessment.

A summary of the SWH assessment for the Study Area is documented in **Table 4.3**. The Detroit River provides a much-needed winter stopover spot for waterfowl as they pass through the area when temperatures are frigid (U.S. Fish & Wildlife Service 2022).

Table 4.3: Significant Wildlife Habitat Assessment for the St. Rose Pumping Station Study Area

Type	Habitat Type (MNRF 2015)	Habitat Description	Candidate SWH in Study Area and Right-of-Way?
Seasonal Concentration Areas	Bat hibernacula	Abandoned mine shafts, underground foundations, caves, and crevices.	**ABSENT**
	Deer wintering congregation areas and deer yards	Deer yards are mapped by MNRF.	**ABSENT** - No deer yards are mapped by MNRF in the Study Area (MNRF 2021a).
	Colonially – nesting bird breeding habitat (bank and cliff)	Eroding banks, sandy hills, steep slopes, rock faces or piles. Cliff faces. Does not include disturbed soil areas such as berms, embankments, oil or aggregate stockpiles.	**ABSENT**
	Colonially – nesting bird breeding habitat (trees/shrubs)	Dead trees in large marshes and lakes, flooded timber, and shrubs, with nests of Great Blue Heron, Great Egret, Green Heron, or Black-crowned Night-Heron.	**ABSENT**
	Colonially – nesting bird breeding habitat (ground)	Rock islands and peninsulas in a lake or large river.	**ABSENT**
	Waterfowl stopover and staging areas	Fields with evidence of annual spring flooding from meltwater or runoff; aquatic habitats such as ponds, marshes, lakes, bays, and watercourses used during migration, including large marshy wetlands.	**PRESENT** - Detroit River is large enough to support large aggregations of waterfowl.
	Shorebird migratory stopover area	Muddy and unvegetated shorelines, beach areas, bars.	**ABSENT**

Table 4.3: Significant Wildlife Habitat Assessment for the St. Rose Pumping Station Study Area

Type	Habitat Type (MNRF 2015)	Habitat Description	Candidate SWH in Study Area and Right-of-Way?
	Raptor wintering areas	Combination of fields and woodland (> 20 ha).	**ABSENT**
	Bat maternity colonies	Mixed and deciduous forests and swamps with large diameter dead or dying trees with cavities.	**ABSENT**
	Reptile hibernacula	Rock piles or slopes, stone fences, crumbling foundations.	**ABSENT**
	Turtle wintering area	Permanent waterbodies and large wetlands with sufficient dissolved oxygen; man-made ponds are not considered SWH.	**ABSENT** - Detroit River is deep enough to provide suitable overwintering habitat, however there is no organic substrate or basking habitat within the Study Area to attract turtles.
	Migratory butterfly stopover area	Fields and forests that are a minimum of 10 ha and are located within 5 km of Lake Erie or Lake Ontario.	**ABSENT:** The Study Area is > 5 km from Lake Ontario or Lake Erie.
	Land bird migratory stopover area	Woodlands of a minimum size located within 5 km of Lake Erie or Lake Ontario.	**ABSENT**
Rare Vegetation Communities	Sand barren, alvar, cliffs and talus slopes	Sand barren, Alvar, Cliff and Talus ELC Community Classes, and other areas of exposed bed rock and patchy soil development, near vertical exposed bedrock and slopes of rock rubble.	**ABSENT**
	Prairie and savannah	Open canopy habitats (tree cover < 60%) dominated by prairie species.	**ABSENT**
	Old growth forest	Relatively undisturbed, structurally complex; dominant trees > 100 years old.	**ABSENT**
	Other rare vegetation communities	Vegetation communities ranked S1-S3 by the NHIC.	**ABSENT**
Specialized Habitat for Wildlife	Waterfowl nesting areas	Upland habitats adjacent to wetlands.	**ABSENT -** Wetland communities are too small to support adjacent significant waterfowl nesting areas.
	Bald Eagle and Osprey nesting, foraging and perching habitat	Treed communities adjacent to rivers, lakes, ponds, and other	**ABSENT -** No stick nests were observed during field investigations.

Table 4.3: Significant Wildlife Habitat Assessment for the St. Rose Pumping Station Study Area

Type	Habitat Type (MNRF 2015)	Habitat Description	Candidate SWH in Study Area and Right-of-Way?
		wetlands with stick nests of Bald Eagle or Osprey.	
	Woodland raptor nesting habitat	Stick nests in forested ELC communities > 30 ha with 10 ha of interior habitat.	**ABSENT**
	Turtle nesting areas	Exposed soil, including sand and gravel in open sunny areas in proximity to wetlands.	**ABSENT -** No natural turtle nesting habitat was observed.
	Seeps and springs	Any forested area with groundwater at surface within the headwaters of a stream or river system.	**ABSENT**
	Amphibian breeding habitat (woodland and wetland)	Treed uplands with vernal pools, and wetland ecosites.	**ABSENT -** No suitable wetland communities in the Study Area.
	Woodland area sensitive breeding bird habitat	Large mature forest stands, woodlots >30 ha with interior forest habitat (i.e., at least 200 m from edge).	**ABSENT**
Habitat for Species of Conservation Concern	Open country bird breeding habitat	Large grasslands and fields (>30 ha) with two or more of the following species: Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow, Northern Harrier, Savannah Sparrow OR with nesting Short-eared Owls.	**ABSENT**
	Shrub/early successional bird breeding habitat	Large shrub and thicket habitats (> 10 ha) with: • At least one Brown Thrasher or Clay-colored Sparrow breeding, OR • At least two of Field Sparrow, Black-billed Cuckoo, Eastern Towhee and Willow Flycatcher, OR • Nesting Yellow-breasted Chat or Golden-winged Warbler.	**ABSENT**

Table 4.3: Significant Wildlife Habitat Assessment for the St. Rose Pumping Station Study Area

Type	Habitat Type (MNRF 2015)	Habitat Description	Candidate SWH in Study Area and Right-of-Way?
	Marsh bird breeding habitat	Wetlands with shallow water and emergent aquatic vegetation with American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon, Sandhill Crane, Green Heron, Trumpeter Swan, Black Tern, or Yellow Rail	**ABSENT**
	Terrestrial Crayfish	Wet meadows and edges of shallow marshes with burrows or chimneys.	**ABSENT -** There were no crayfish chimneys identified.
	Special Concern and provincially rare (S1-S3) wildlife	An assessment of habitat for special concern and provincially rare wildlife is included in **Table 4.2**.	**ABSENT** - There was no suitable habitat for Common Nighthawk, Red-headed Woodpecker, Monarch, Eastern Milksnake, Map Turtle and Snapping Turtle identified in the Study Area.
Animal Movement Corridors	Amphibian movement corridors	Associated with confirmed amphibian breeding habitat.	**ABSENT -** Although this habitat type cannot be confirmed without targeted amphibian surveys, the Study Area shoreline does not provide suitable habitat for amphibian movement because vegetation in the ROW is sparse and highly disturbed.

4.4 Fish Habitat

The Detroit River provides fish habitat as defined in the *Fisheries Act*. The Detroit River supports a diverse fish community with cool, cold and warm water thermal preferences. The shallow nearshore areas in the Study Area provide habitat for fish species with warm thermal regime tolerances. The nearshore area has been mapped by DFO (2022) as critical habitat for an aquatic SAR which is the Northern Madtom. The artificial shoreline at the Site provides no fish habitat diversity and limits the potential for the area to provide important fish habitat functions. For example natural gradual shorelines usually provide important fish habitat functions resulting from a variety of substrates and depths.

5 Description of Work

To improve flood resiliency in the St. Rose drainage area, the City of Windsor SMP (City of Windsor 2020) determined a new stormwater pumping station is required near the existing gravity outfall. Through a Comparative Evaluation of Site Location (Stantec 2022), the St. Rose Beach Park was identified as the preferred site for the proposed pumping station. This alternative is in closest proximity to the existing outfall and does not require displacement of any existing residences.

The proposed St. Rose Pumping Station would house three large sized pumps and two smaller pumps, which will be designed with a total capacity of 13.5 m^3/s and provide flood relief for the 1 in 100-year storm event. Axial flow pumps are recommended based on their high efficiency in high flow – low head applications, relatively low space requirement, and relatively low capital cost in comparison to the other pumping alternatives. A stormwater outlet headwall structure is proposed on the north side of the Site. The outlet does not extend into the river and will be built into the steel sheet piles under the concrete walkway. The recommended Site layout features the pumping station and electrical equipment on the central and eastern portion of the Site. A Site Plan of the preferred design is included in **Appendix C**. A drawing of a bird's eye view of the preferred design is included in **Appendix D**.

6 Impact Assessment

Potential impacts associated with the proposed construction of the St. Rose Pumping Station include soil compaction, siltation and spills of deleterious substances into the Detroit River, noise disturbance and encounters with wildlife. The 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 as discussed in **Section 7**.

6.1 Terrestrial Environment

Installation of the St. Rose Pumping Station will not result in an impact on vegetation communities. No permanent impact to breeding birds, reptiles and other wildlife, is expected as a result of the installation of the St. Rose Pumping Station provided mitigation measures are followed as discussed in **Section 7**.

6.2 Species at Risk

The artificial shoreline may provide suitable nesting habitat for Barn Swallow. Investigations are recommended during the breeding bird season to confirm if Barn Swallows are nesting on the artificial shoreline structure. Eastern Foxsnake also have potential to be present in the Study Area; mitigation recommendations are provided in Section 7.4. No impacts to Barn Swallow or Eastern Foxsnake are expected as a result of the St. Rose Pumping Station installation provided mitigation measures described in **Section 7** are followed.

6.3 Significant Wildlife Habitat

Installation of the St. Rose Pumping Station will not result in an impact to waterfowl stopover in the Detroit River as the project does not have a footprint in the water.

6.4 Fish and Fish Habitat

Installation of the St. Rose Pumping Station will result in a short-term impact to fish habitat as a result of the temporary isolation and dewatering of the work area required to construct the outlet. No permanent impacts to fish and fish habitat are expected as a result of the installation of the St. Rose Pumping Station provided mitigation and contingency measures are followed. Installation of the St. Rose Pumping Station will not result in an impact to critical habitat for Northern Madtom in the Detroit River as the project does not have a footprint in the water. Mitigation measures for the protection of fish and fish habitat are provided in **Section 7.5**.

7 Mitigation Measures

7.1 General Mitigation Measures

The following general mitigation measures are recommended:

- Construction and tree protection fencing shall be installed prior to the start of construction, after layout, and shall be reviewed by an engineer.
- No tree removals (if required) shall be undertaken without approval from the City.
- A containment and spill management plan shall be implemented to reduce the risk of deleterious substances from entering the Detroit River.
- An emergency spill kit shall be kept on site during construction activities.
- Service equipment shall be washed, refueled and/or a minimum of 30 m from watercourses to reduce the risk of deleterious substances entering the watercourse.
- Construction machinery shall be cleaned prior to entering the site to reduce the potential for establishment of invasive species, such as *Phragmites*.

7.2 Erosion and Sediment Control

Appropriate erosion and sediment controls are required to be employed during all phases of construction to reduce erosion and sediment transport into the Detroit River to the extent possible. Mitigation measures to reduce the risk of negative effects on fish, fish habitat and water quality in the Detroit River are listed below:

- Silt fence shall be installed around the perimeter of the work area.
- Materials requiring stockpiling (fill, topsoil, etc.) shall be stabilized and kept at least 30 m from the Detroit River.
- Disturbed areas are to be restored with erosion protection/vegetative cover following disturbance.
- Erosion and sediment control materials (silt fence, strawbales, clear stone) are to be kept on site for emergencies and repairs.
- Erosion and sediment controls should be monitored and maintained, as required. Controls are to be removed only after the soils of the construction area have been stabilized and adequately protected until cover is re-established.
- Conditions of the anticipated ERCA permit under Ontario Regulation (O. Reg.) 171/06 (see **Section 8.1**) should be followed during these activities.

7.3 Protection of Migratory Birds

The *Migratory Birds Convention Act,* 1995 (MBCA) provides legal protection of migratory birds and their active nests in Canada. The loss of migratory bird nests, eggs and/or nestlings due to tree cutting or other vegetation clearing can be avoided by limiting clearing of vegetation to outside of the general nesting period for migratory birds in this region (C2) as identified by Environment and Climate Change Canada (ECCC) (i.e., between April 1 and August 31) (ECCC 2022). If work must be performed within this window, a survey for active nests or breeding activity should be conducted by a qualified biologist before work commences and additional mitigation measures (e.g., implementation of avoidance distances during construction) implemented, if required.

7.4 Wildlife Protection

Reptiles (including Eastern Foxsnake) may be active from approximately April 1 to November 30. Eastern Foxsnake is more likely to be encountered from May to mid-October when the weather is warmer and they are more mobile Avoiding this window will reduce the likelihood of encounters with reptiles.. If this period cannot be avoided, then installation of silt fencing around the work area (**Appendix D**) shall reduce the likelihood of reptiles entering the work area. Fencing materials with plastic mesh will not be used due to risk of entanglement of snakes or other wildlife. Further 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). 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 are encountered, they will be given reasonable time to flee the area on their own. If a wildlife species must be moved, a person knowledgeable in handling techniques may relocate it to a location that is both safe and suitable.

7.5 Protection of Fish and fish Habitat

In addition to the measures to protect water quality presented, in **Sections 7.1** and **7.2**, the following measures are recommended to protect fish and fish habitat:

- Avoid in-water work during the restricted activity period for spring spawning fish species in the MNRF's Southern Region (i.e., no in-water work March 15 to July 15) (MNR 2013).
- The contractor shall monitor the five-day weather forecast on a daily basis to anticipate weather conditions and shall be prepared to leave the site in a stable and secure condition should water levels rise.
- Prior to in stream construction activity, exclude fish from the work areas by implementing a fish removal and relocation plan.
- During dewatering of the in-water work area the dewatering pump inlet must be covered with filter fabric or clear stone. The outlet must discharge to a sediment bag or trap. Discharge from the bag is to be released to a relatively flat vegetated location or if vegetated location is not available, a flow dissipating structure should be provided.

- Water from dewatering and unwatering operations shall be directed to a sediment control measure and/or a vegetated discharge are 30 m away from the waterbodies or as far as practical from the top of bank of any waterbody, prior to discharge to the natural environment. No dewatering shall be sent directly to a sewer. These control measures shall be monitored for effectiveness and maintained or revised to meet the objective of reducing the risk of the entry of sediment into the watercourse.
- All water intakes used to dewater area(s) that may contain fish should be screened to reduce the risk of the impingement and entrainment of fish as per DFO's *Interim Code of Practice: End-of-Pipe Fish Protection Screens for Small Water Intakes in Freshwater* (DFO 2021c).

8 Permitting Considerations

8.1 Essex Region Conservation Authority

Conservation Authorities Act - The Study Area is located in the Essex Region Conservation Authority (ERCA) regulated area related to the Detroit River and its associated floodplain. As such, development in the ERCA regulated area is subject to the policies of O. Reg. 171/06 under the *Conservation Authorities Act*.

8.2 Ministry of the Environment, Conservation and Parks

Endangered Species Act, 2007 (ESA) - A single species at risk, Barn Swallow, was identified as having potential to occur within the Study Area, however, there is a low likelihood of occurrence because there are no recent records, and the area is heavily disturbed. Avoidance of the migratory bird nesting season (April 1 - August 31) is recommended. If this is not possible, then bird nesting surveys must be completed in advance of construction. With the implementation of this mitigation, no authorizations are needed under the ESA.

8.3 Fisheries and Oceans Canada

Fisheries Act and *Species at Risk Act* (SARA) - Under the fish and fish habitat protection provisions of the *Fisheries Act*, any works, undertaking or activity of a project must incorporate measures to avoid causing the death of fish and the harmful alteration, disruption or destruction (HADD) of fish habitat. To assist proponents with determining if their project will comply with the fish and fish habitat provisions, DFO provides measures to protect fish and fish habitat (DFO 2021b) as well as several standards and codes of practice (DFO 2021c). If it is determined that a project cannot implement the measures to protect fish and fish habitat and if there are no applicable standards and codes of practice, then it is recommended that the proponent request a review of the project by DFO. If DFO determines that a project will result in the death of fish and/or HADD of fish habitat an Authorization under the *Fisheries Act* may be required (DFO 2021d).

Based on the presence of fish habitat in the Study Area, the proposed activities, and DFO's current guidelines, Stantec recommends that a DFO Request for Review form be completed and submitted to DFO for review of the project under the *Fisheries Act*. DFO also reviews projects under the federal SARA. A SARA permit may be required by DFO for potential handling of Aquatic SAR during in water construction activities.

9 Summary

The City of Windsor identified that the recommended location for the St. Rose Pumping Station is the St. Rose Beach Park greenspace on the north side of Riverside Drive East within the existing sheet pile / break wall area of the park through the completion of the comprehensive SMP study (City of Windsor 2020) and Comparative Evaluation of Site Location (Stantec 2022).

The proposed St. Rose Pumping Station would house three large sized pumps and two smaller pumps, which will be designed with a total capacity of 13.5 m^3/s and provide flood relief for the 1 in 100-year storm event. Axial flow pumps are recommended based on their high efficiency in high flow – low head applications, relatively low space requirement, and relatively low capital cost in comparison to the other pumping alternatives. A stormwater outlet headwall structure is proposed on the north side of the Site. The outlet does not extend into the river and will be built into the steel sheet piles under the concrete walkway.

Stantec completed a desktop search for SAR records within 2 km of the Site. Stantec also completed a field visit to study the terrestrial and aquatic environment on the Site and the nearshore aquatic habitat in the Detroit River.

The proposed St. Rose Pumping Station will not have a permanent impact on fish and fish habitat. The proposed construction activities required to build the outlet may have the potential to temporarily impact warmwater fish habitat in the Detroit River including critical habitat for an aquatic SAR (Northern Madtom). Impacts to fish and fish habitat and terrestrial natural heritage resources can be avoided through mitigation measures described in **Section 7.5** of this report.

The proposed St. Rose Pumping Station will not have a permanent impact on vegetation communities or significant wildlife including waterfowl stopover and staging areas. The proposed construction activities also have the potential to impact Barn Swallow if present along the artificial shoreline. Impacts to Barn Swallow can be avoided through mitigation measures described in **Section 7** of this report.

No provincially or federally protected species will be impacted by the proposed activities provided mitigation measures described in **Section 7** can be followed.

With respect to permitting requirements, a permit will be required from ERCA under O. Reg. 171/06. Due to the need to construct below the ordinary high water mark of the Detroit River, a DFO Request for Review is recommended for review under the federal *Fisheries Act* and SARA. No permitting requirements were identified under the provincial ESA.

10 Resources

A.A. Reznicek, E. G. Voss, & B. S. Walters. 2011. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 23, 2021. http://michiganflora.net/

Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier (eds.). 2007: Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto. xxii + 706 pp. Available at: http://www.birdsontario.org/atlas/index.jsp.

Catling, P.M, and V.R.Brownell. 2000. Damselflies and Dragonflie (Odonata) of Ontario: Resource Guide and Annotated List. ProResources, Metcalfe, Ontario. 200 pp.

City of Windsor 2013 City of Windsor Official Plan Volume 1 Official Plan Amendment #85 was approved by the Ministry of Municipal Affairs and Housing on 08/28/2013

City of Windsor 2020 Sewer and Coastal Flood Protection Master Plan prepared for the City of Windsor by Dillon and Aquafor Beech November 2020

Clark, R.J. 1975. A field study of the Short-eared Owl (*Asio flammeus*) Pontoppidan in North America. Wildlife Monogr. 47: 1-67.

COSEWIC 2002. COSEWIC assessment and update status report on the spiny softshell turtle Apalone spinifera in Canada. Committee on the Status of Endangered Wildlife in Canada. Vii + 17 pp.

COSEWIC 2003. COSEWIC assessment and update status on report on the climbing prairie rose Rosa setigera in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 15 pp

COSEWIC. 2009. COSEWIC assessment and update status report on the Horned Grebe Podiceps auritus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 42 pp.

COSEWIC. 2007. COSEWIC assessment and update status report on the Five-lined Skink Eumeces fasciatus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa.iv + 42 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC, 2008. COSEWIC assessment and update status report on the Eastern Foxsnake Elaphe gloydi, Carolinian population and Great Lakes/St. Lawrence poplation, in Canada. Committeee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 45 pp. www.sararegistry.gc.ca/status/status_e.cfm

COSEWIC. 2010. COSEWIC assessment and status report on the Butler's Gartersnake Thamnophis butler in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 51 pp

COSEWIC. 2018. COSEWIC assessment and status report on the American Bumble Bee Bombus pensylvanicus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 52 pp. (http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1).

DFO (Fisheries and Oceans Canada). 2022a. Aquatic Species at Risk Maps. Available Online: https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html. Last updated April 26, 2022. Accessed July 2022.

DFO (Fisheries and Oceans Canada). 2022b. Measures to protect fish and fish habitat. Available Online: http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html. Last updated August 28, 2019. Accessed July 2022.

DFO (Fisheries and Oceans Canada). 2021c. Standards and codes of practice. Available Online: http://www.dfo-mpo.gc.ca/pnw-ppe/practice-practique-eng.html.. Last updated February 10, 2021. Accessed July 2022.

DFO (Fisheries and Oceans Canada). 2022d. Projects Near Water. Available Online: http://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/request-review-demande-d-examen-001-eng.html Last updated June 23, 2022. Accessed: July 2022.

Dobbyn, J.(S.). 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists, Don Mills, Ontario, 120 pp. ISBN 1-896059-02-3.

eBird. 2022. eBird: An online database of bird distribution and abundance [web application]. eBird, Cornell Lab of Ornithology, Ithaca, New York. Available: http://www.ebird.org. Accessed: July 19, 2022.

ECCC (Environment and Climate Change Canada). 2018. Recovery Strategy for the Butler's Gartersnake (*Thamnophis butleri*) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. viii + 51 pp.

ECCC (Environment and Climate Change Canada). 2022. General Nesting Periods of Migratory Birds in Canada. Retrieved July 19, 2022 from: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1#_05.

Friesen, Lyle and M. Stabb. 2001. Preserve Endangered Songbirds Factsheet: Acadian Flycatchers and Hooded Warblers. Bird Studies Canada. 2001.

GLFC 2022 web site Great Lakes Fishery Commission retrieved on July 19, 2022 from http://www.glfc.org/

Google Earth 2022 Google Earth Pro Web Application Ver. 7.3.3.7786. 2022. Google Earth.

Government of Canada. 2021a. Species at Risk Act. S.C. 2002, c. 29. Schedule 1. Accessed July 2022

Holm E., N. Mandrak, M. Burridge. 2022. The ROM field guide to freshwater fishes of Ontario. Royal Ontario Museum. April 2022

Hall, P. W., C. Jones, A. Guidotti, and B. Hubley. 2014. The ROM field guide to butterflies of Ontario. Toronto, Ont: Royal Ontario Museum.

Kindree, M.M. and Mandrak, N.E. 2020. Fish Assemblage Survey of the Detroit and St. Clair rivers: 2007-2014. Can. Manuscr. Rep. Fish. Aquat. Sci. 3204: viii + 70 p.

Schloesser, D.W., Janice L. Metcalfe-Smith, William P. Kovalak, Gary D. 2006. Extirpation of Freshwater Mussels (Bivalvia: Unionidae) following the Invasion of Dreissenid Mussels in an Interconnecting River of the Laurentian Great Lakes. The American Midland Naturalist , Apr., 2006, Vol. 155, No. 2 (Apr., 2006), pp. 307-320

Layberry, R.A., P.W. Hall and J.D. Lafontaine. 1998. The butterflies of Canada. University of Toronto Press, Toronto. 280pp.

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological land classification for Southern Ontario: first approximation and its application. Ontario Ministry of Natural Resources, South Central Region, Science Development and Transfer Branch. Technical Manual ELC-005.

Lotts, K., and T. Naberhaus, coordinators. 2017. Butterflies and Moths of North America. Available online: http://www.butterfliesandmoths.org/ (Version December 2018).

MacCulloch, R.D. 2002. The ROM Field Guide to Amphibians and Reptiles of Ontario. Royal Ontario Museum: Toronto, ON. 168 p.

MECP (Ministry of the Environment, Conservation and Parks). 2022 Species at Risk in Ontario (SARO) List. Available online: https://www.ontario.ca/page/species-risk-ontario

Metcalfe-Smith, J. L., MacKenzie, A., Carmichael, I., & D. McGoldrick. (2012). Photo Field Guide to the freshwater mussels of Ontario. St. Thomas Field Naturalist Club.

MNR (Ontario Ministry of Natural Resources). 2000. Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch. Queen's Printer for Ontario. October 2000.

MNR (Ontario Ministry of Natural Resources). 2013. In-water Timing Window Guidelines, Ontario Ministry of Natural Resources. March 11, 2013

MNRF (Ontario Ministry of Natural Resources and Forestry). 2015. Significant Wildlife Habitat Ecoregion 6E Criterion schedule.

MNRF [Ontario Ministry of Natural Resources and Forestry]. 2022a. Land Information Ontario Digital mapping of Aquatic resource area line segment, Ontario Ministry of Natural Resources. Available Online: https://geohub.lio.gov.on.ca/datasets/5e67132418f24488980fd19b4cbb0972/explore?location=49.291899% 2C-84.834657%2C5.30

MNRF (Ministry of Natural Resources and Forestry). 2022b. Constructed Drains digital dataset. Distributed and updated continuously by Land Information Ontario. Available at: https://www.gisapplication.lrc.gov.on.ca/AIA/index.html?viewer=AIA.AIA&locale=en-US

MNRF (Ontario Ministry of Natural Resources and Forestry). 2022c. Natural Heritage Information Centre (NHIC) Data on the Land Information Ontario mapping website. Ontario Ministry of Natural Resources and Forestry. Available Online: http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US

MNRF (Ontario Ministry of Natural Resources and Forestry). 2022d. Ontario Plant Community and Vascular Plant Lists. Natural Heritage Information Centre, Ontario Ministry of Natural Resources and Forestry, Peterborough. Available Online: https://www.ontario.ca/page/get-natural-heritage-information

Ontario Nature. 2022. Ontario Reptile and Amphibian Atlas. Available Online: http://www.ontarionature.org/protect/species/herpetofaunal_atlas.php. Accessed July 2022

Sandilands. A. 2005. Birds of Ontario. Habitat Requirements, Limiting Factors and Status. UBC Press.

Stantec 2022 St. Rose Avenue Pumping Station - Comparative Evaluation of Site Location prepared by Stantec, January 28, 2022

Scott, W.B. and E.J. Crossman, 1998. Freshwater fishes of Canada. Oakville (Ontario, Canada): Galt House Publications. xx+966 p.

U.S. Fish & Wildlife Service 2022 Detroit River International Wildlife Refuge Information Web pages accessed at https://www.fws.gov/refuge/detroit-river/species on July 28, 2022

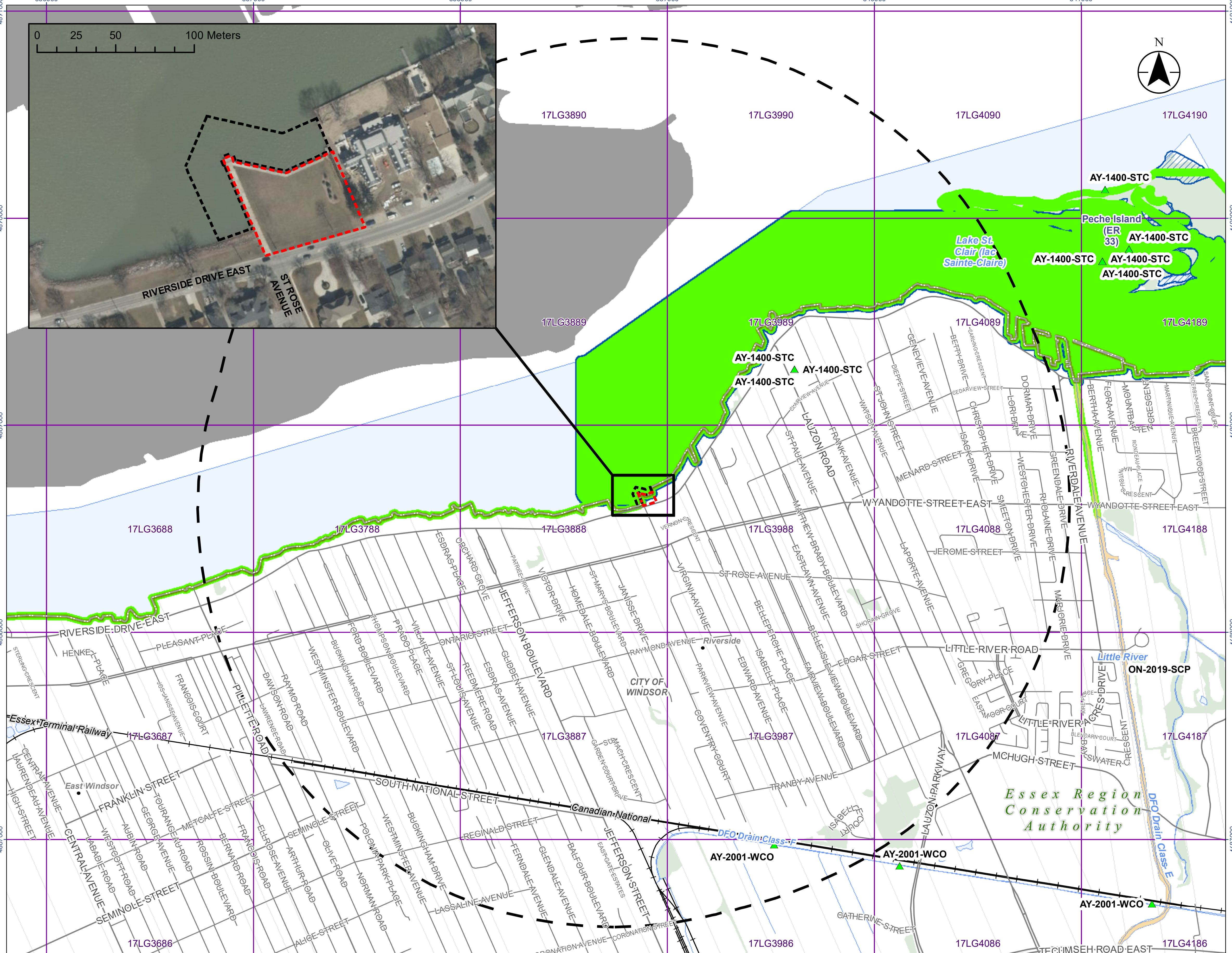
Whitehead, D. R., and T. Taylor. 2002. Acadian Flycatcher (*Empidonax virescens*). *In* The Birds of North America, No. 614 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

WATRI (Wisconsin Aquatic and Terrestrial Resources Inventory) 2021. Species Accounts. Retrieved May 17, 2021, from https://wiatri.net/inventory/odonata/speciesaccounts/

Wygodzinsky, P. W., & Schmidt, K. (1980). Survey of the Microcoryphia (Insecta) of the Northeastern United States and adjacent provinces of Canada. American Museum of Natural History.

APPENDICES

Appendix A Figures



Legend
- Study Area
- Site Boundary
- Aquatic Study Area
- Fish Survey Point (ARA)
- Constructed Drain
- Railway
- Watercourse (Permanent)
- Conservation Authority Administrative Boundary
- Thermal Regime, Warm
- Aquatic Species at Risk Distribution
- Aquatic Species at Risk Critical Habitat
- Waterbody
- Wetland, Provincially Significant
- Wooded Area
- Lot
- Municipal Boundary, Lower
- 1 km UTM Grid

0 1 km

1:19,000 (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, 2022.
3. Orthoimagery © First Base Solutions, 2022. Imagery Date, 2019.

Project Location
City of Windsor

165620239 REV4
Prepared by KB on 2022-07-20
Technical Review by DH on 2022-07-13

Client/Project
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
1

Title
Site Location and Background Data

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Stantec

Legend

- Site Boundary
- Aquatic Study Area
- Bathymetric Contour (0.4 metre intervals)
- ELC Boundary

Substrate (Approximate)

- Boulders
- Cobble/ Boulder
- Cobble/ Gravel
- Sand/ Silt

ELC Description

- **CGL_4**: Recreational
- **OA**: Open Water
- **SAS**: Submerged Shallow Aquifer

0 10 20 m

1:600 (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, 2022.
3. Orthoimagery © First Base Solutions, 2022. Imagery Date, 2019.
4. Bathymetry data was collected by Stantec and should be considered to have vertical and horizontal standard error of +/- 5 cm.
5. Bathymetry data is based on a water level elevation of 175.59 m IGLD which was obtained from NOAA station at St. Clair Shores, MI on the date of the survey (20211015).

Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-07-20
Technical Review by DH on 2022-07-12

Client/Project
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
2

Title
Terrestrial & Aquatic Habitat Exisitng Conditions

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Stantec

Legend

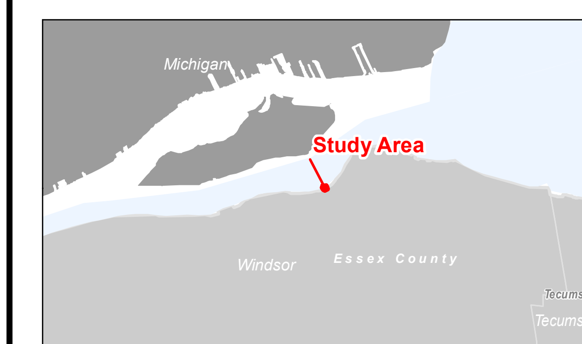
- Site Boundary
- Aquatic Study Area
- Site Plan (Approximate)

0 10 20 metres

1:600 (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, 2022.
3. Orthoimagery © First Base Solutions, 2022. Imagery Date, 2019.



Project Location
City of Windsor

165620239 REVA
Prepared by KB on 2022-07-20
Technical Review by DH on 2021-09-14

Client/Project
ST. ROSE PUMPING STATION MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
3

Title
Proposed Conditions

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Appendix B Photographic Record

Photo 1: Conditions along the shoreline facing northeast. Date: October 18, 2021.

Photo 2: Conditions along the shoreline facing east. Date: October 18, 2021.

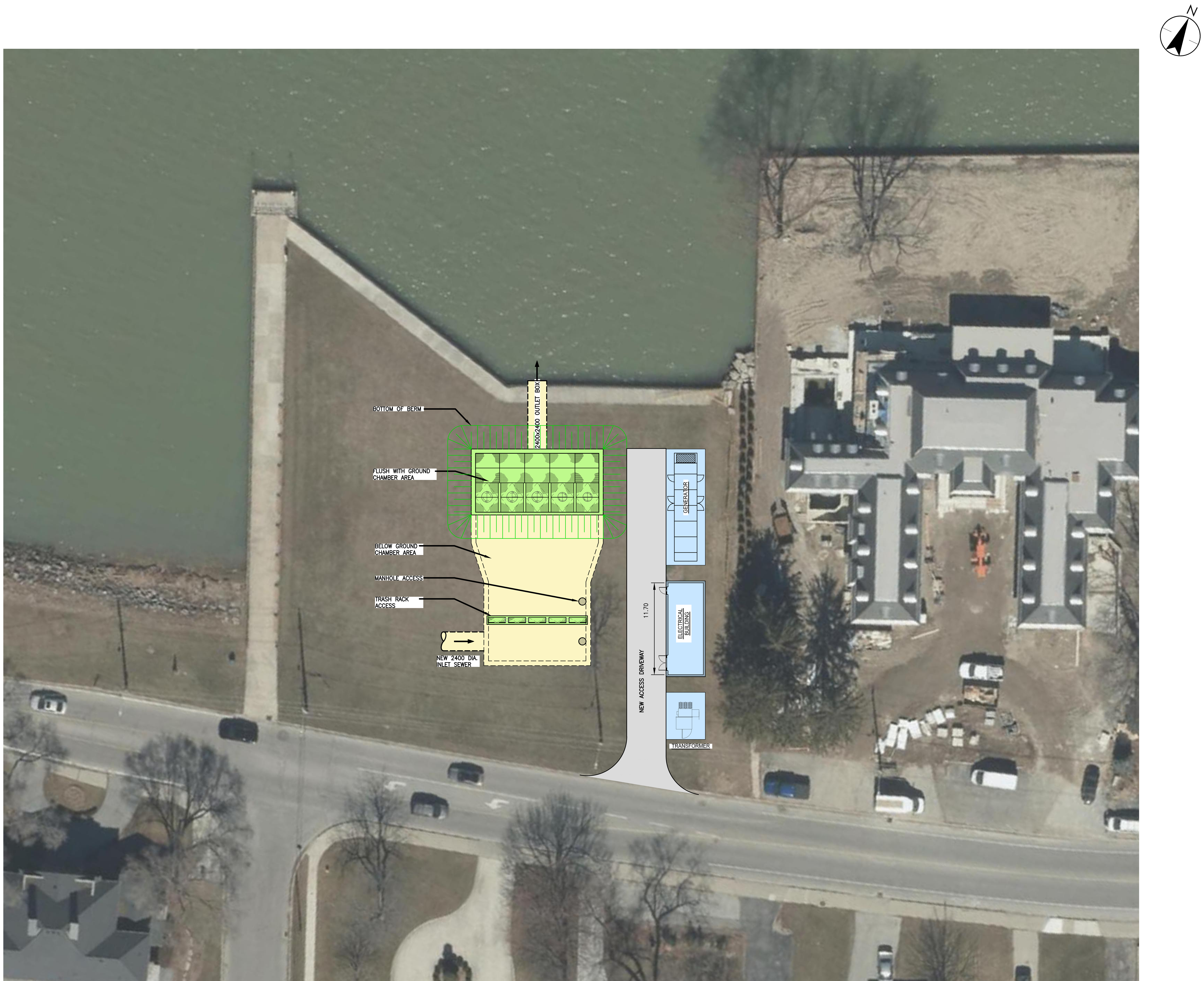
Photo 3: Conditions along the shoreline facing southwest. Date: October 18, 2021.

Photo 4: Conditions along the shoreline facing south. Date: October 18, 2021.

Photo 5: Conditions along the shoreline facing southwest. Date: October 18, 2021.

Photo 6: Aquatic macrophytes observed adjacent to steel sheet piling. Date: October 18, 2021.

Appendix C Preferred Design – Site Plan



AERIAL PLAN
SCALE: 1:250

OPTION - 1-3

Stantec
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Legend

Notes

Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD
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File Name: 165620239_SW-201	Q.K.	J.L.	J.L.	2021.09.14
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Permit/Seal

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Client/Project
CORPORATION OF THE CITY OF WINDSOR
ST. ROSE STORM WATER PUMPING STATION

NEW PUMPING STATION

City of Windsor, Ontario

Title
SITE PLAN

Project No. 165620239
Scale AS SHOWN
Revision
Sheet
Drawing No.
SW-201

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Appendix D Preferred Design – Birds Eye View