

**Stormwater Master Plan and
Municipal Class Environmental
Assessment Study**

**Detroit River Storm Sewer
Outfalls, Stage 2**

Prepared for:
Town of LaSalle

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August 2024

SIGN OFF SHEET

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EXECUTIVE SUMMARY

The Town of LaSalle (Town) has undertaken a Stormwater Master Plan (SWMP) for the Detroit River Storm Sewer Outfalls. The SWMP reviewed portions of the stormwater drainage system that connect directly to the Detroit River or have an indirect connection through the Marentette Drain and tributary drains. The main objective of the SWMP was to identify opportunities for potential infrastructure enhancements and improvements to protect public and private property from the effects of stormwater flooding, while also preserving the natural environment.

The SWMP is being completed in three stages. Improvements will be identified for each Stage, with the preferred solutions presented at Public Information Centres. The Stage 1 catchment area has been completed, and additional information is available on the Town's website. This report focuses on the Stage 2 catchment area along Front Road and connections to the Marentette Drain and its tributary drains. Stages 1 and 3 Reports are provided under separate cover.

Five alternative solutions were developed to determine the preferred solution for improvements to the Stage 2 catchment area:

- Alternative 1 – Do Nothing.
- Alternative 2 – Upsize Sewers.
- Alternative 3 – Pump Stations.
- Alternative 4 – Combined Solution.
- Alternative 5 – Private Drainage Solutions.

The alternative solutions were evaluated against criteria that considered the natural, socio-economic, cultural, and technical environments. Model results of road ponding during the two design storms under both boundary conditions shows that the existing system generally operates up to a 5-year design storm. Modelling shows that the overall reduction in ponding depths under the improvement scenarios is very minimal compared to the Do-Nothing Scenario. Alternative 4 shows improvements under the 100-year storm events, removing nearly all ponding greater than 0.5 m, but ponding remains above 0.3 m up to 0.5 m in many areas. Alternatives 2 to 4 also come with a significant cost, for relatively small performance improvements.

Alternative 5 – Private Drainage Solutions was determined to be the most preferred solution as a result of the evaluation. The improvements will have no impacts to environmental, social and cultural features as improvements would occur by property owners on private property.



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This alternative proposes a combination of measures:

- Maintaining private drainage systems.
- Downspout Disconnection.
- Adding storage capacity.
- Sump pump system with backflow preventor (check valve).

The improvements to reduce the risk of flooding includes maintaining and improving private drainage systems to ensure adequate drainage of surface, roof and groundwater around the home, towards the Town's stormwater system. The improvements on private property would provide targeted improvements that address flooding issues for residents as needed.

The improvements recommended in this Stage 2 SWMP will be completed on private property to private drainage systems. As a result, the improvements are exempt from the Municipal Class Environmental Assessment (MCEA) process, as noted in Table ES1, and no further work is required.

Table ES1: MCEA Project Classification

Project Description	MCEA Project Schedule
Private Drainage Solutions (i.e., maintaining private drainage systems, downspout disconnection, adding storage capacity, sump pump system with backflow preventor)	Exempt



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1.0 Introduction

The Town has undertaken a SWMP for the Detroit River Storm Sewer Outfalls. The SWMP reviewed portions of the stormwater drainage system that connect directly to the Detroit River or have an indirect connection through the Marentette Drain and tributary drains. The main objective of the SWMP was to identify opportunities for potential infrastructure enhancements and improvements to protect public and private property from the effects of stormwater flooding, while also preserving the natural environment.

The SWMP is being completed in three stages. Improvements will be identified for each Stage, with the preferred solutions within each stage documented in individual reports and Public Information Centres. The stages are identified below:

- Stage 1 included catchments along Front Road between Turkey Creek and Gary Avenue.
- Stage 2 included catchments serviced by the Marentette Drain.
- Stage 3 included catchments along Front Road between Victory Street and Malden Road.

Each Stage of the SWMP is documented separately summarizing findings and recommendations, while documenting the MCEA process. This report documents Stage 2 including catchments along Front Road and connections to the Marentette Drain and its tributary drains. Stages 1 and 3 Reports are provided under separate cover.

1.1 Background

The Town of LaSalle initiated the SWMP following record-breaking high-water levels in the Detroit River in 2019 and 2020. These high-water levels caused overland flooding and roadway ponding within the catchment areas due to low surface topography and heavy rainfall events.

The Detroit River water levels have a significant impact on the capacity of the LaSalle storm sewer system in the Study Area. Historic mean water levels have generally fluctuated within a 2-metre (m) range. A maximum water level of approximately 175.8 m was recorded on May 18, 2020, and mean water levels were at their maximum during the spring and summer of 2022. As a point of reference, the Front Road bridge deck at Marentette Drain is at an elevation of approximately 175.9 m.



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1.2 Study Area

The overall SWMP Study Area is displayed in Figure 1. The overall Study Area begins at Turkey Creek to the north, the Town of LaSalle Town limits to the south, and the Detroit River to the west to capture the drainage which outfalls into the river. The eastern borders of the Study Area vary, to capture the catchment areas within the Town that are serviced by the existing stormwater infrastructure. Figure 1 displays the Stage 2 SWMP Study Area.

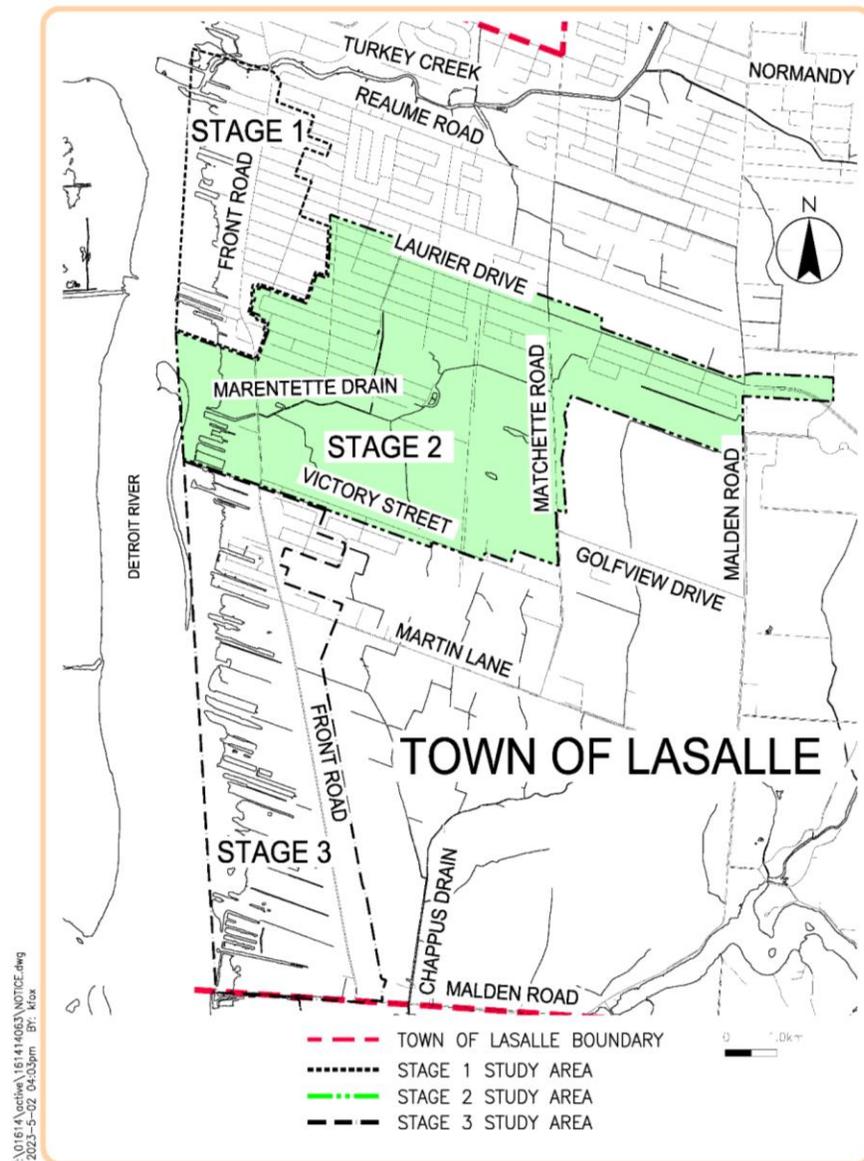


Figure 1: Overall SWMP Study Area



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1.2.1 Stage 1 Area

The Stage 1 project area includes catchments along Front Road between Turkey Creek and Gary Avenue. Five outlets are present, including one that outlets to Turkey Creek to the north, and four which discharge directly into the Detroit River.

1.2.2 Stage 2 Area

The Stage 2 project area includes multiple outlets into the Marentette Drain and its tributaries including the Lafferty Drain, Gignac Drain and North Branch Railway Drain. The Marentette Drain then outlets directly to the Detroit River just west of Front Road.

1.2.3 Stage 3 Area

The Stage 3 project area includes catchments along Front Road between Victory Street and Malden Road. 20 outfalls are present that discharge directly into the Detroit River.



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2.0 Municipal Class EA Process

The *Environmental Assessment Act of Ontario* (EAA) provides for the protection, conservation, and management of the environment in Ontario. The EAA applies to municipalities and to activities including municipal road projects. Activities with common characteristics and common potential effects may be assessed as part of a “class” and are therefore approved subject to compliance with the pre-approved Class EA process. The Ministry of the Environment, Conservation and Parks (MECP) is responsible for administration of the EA Act.

The MCEA is an approved Class EA process that applies to municipal infrastructure projects including roads, water, and wastewater. This process provides a comprehensive planning approach to consider alternative solutions and evaluate their impacts on a set of criteria (e.g., transportation, environmental, social, engineering considerations) and determine mitigating measures to arrive at a preferred alternative for addressing the problem (or opportunity). The Class EA process involves a rigorous public consultation component that includes various provincial and municipal agencies, Indigenous communities, and the public, at each of the project stages.

Projects and improvements recommended as part of this Master Plan will be subject to the MCEA process amended in 2023.

2.1 Planning Process

The MCEA process is undertaken prior to modifications or additions to municipal infrastructure, to ensure that potential impacts associated with all project aspects are considered. The MCEA process, as shown in Figure 2 below, was developed by the Municipal Engineers Association (MEA) to fulfill the requirements of the Environmental Assessment Act, R.S.O 1990, for municipal infrastructure projects, and consists of the following five (5) phases:

- **Phase 1:** Identify the problem/opportunity.
- **Phase 2:** Identify and evaluate alternative solutions.
- **Phase 3:** Identify and examine alternative design concepts for the preferred solution.
- **Phase 4:** Formally document the planning process in an Environmental Study Report (ESR).
- **Phase 5:** Proceed to implementation.

The MCEA flowchart displayed in Figure 2 follows the MCEA process amended in 2023.



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

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

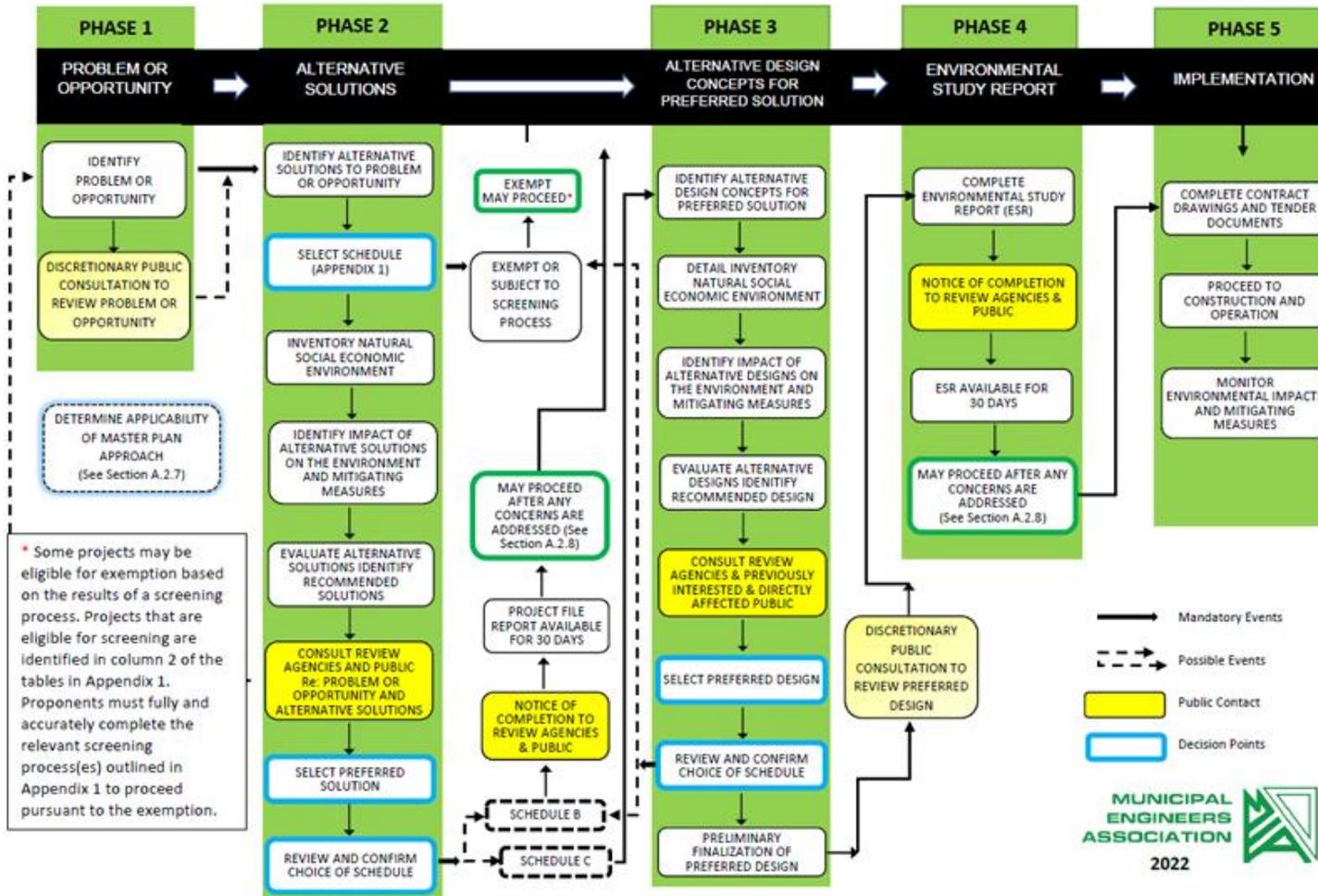


Figure 2: MCEA Process Flowchart



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Based on the nature and extent of the project, as well as its anticipated impacts to the surrounding environment, the MCEA document specifies three different schedules under which projects may be planned, and the assessment process required for each:

Exempt projects are pre-approved under the MCEA and can proceed directly to Phase 5 (implementation). Exempt projects, formerly Schedule A and A+ projects, include various municipal maintenance, operational activities, rehabilitation works, minor reconstruction or replacement of existing facilities, and new facilities that are limited in scale and have minimal adverse effects on the environment. These projects are exempt from the requirements of the *Environmental Assessment Act*.

Schedule B projects have potential for some adverse environmental impacts. These projects are required to proceed through the first two phases of the MCEA process, involving mandatory contact with directly affected public and relevant review agencies, to ensure that they are aware of the project and that their concerns are identified and considered. A Project File Report must be prepared and made available for review (30-day public review period) by any interested person or party. If there are no outstanding concerns or Section 16 Orders, then the proponent may proceed to implementation/detail design (i.e., Phase 5) once the regulatory process has been completed. Schedule B projects generally include improvements and minor expansions to existing facilities or smaller new projects.

Schedule C projects have the potential for more significant environmental impacts. These projects are required to proceed through all five stages of the MCEA process. Schedule C projects require an Environmental Study Report be completed and filed for a 30-day public review period. If there are no outstanding concerns, the proponent may proceed to implementation once the regulatory process has been completed. These projects generally include the construction of new facilities, or major expansions to existing facilities.

The selection of the appropriate project schedule to be followed is dependent on the anticipated level of environmental impact, and at times the estimated construction costs.

The MEA Class EA document also identifies different approaches to completing Master Plans corresponding to different levels of assessment. Regardless of the approach selected, Master Plans must follow at least the first two phases of the MCEA process.

Approach 1 is undertaken with a broad scope and level of assessment. This process follows Phases 1 and 2 as defined above, then uses the Master Plan as a basis for future investigations of site-specific Schedule 'B' and 'C' projects. Any Schedule 'B' and 'C' projects that need specific Phase 2 work and Phases 3 and 4 work, usually have this Phase 2, 3, and 4 deferred until the actual project is implemented.



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Approach 2 is to complete all work necessary for Schedule 'B' site-specific projects at the time they are identified. Using this approach, a municipality would identify everything it needed in the first five years and would complete all the site-specific work required, including public consultation to meet Class EA requirements. The Master Plan in such cases has to be completed with enough detail so that the public can be reasonably informed, and so that the approving government Agencies (Conservation Authorities, MECP, MCM, etc.) can be satisfied, in principal, that their concerns will be addressed before construction commences.

Approach 3 is to complete the requirements of Schedule 'B' and Schedule 'C' at the Master Plan stage.

2.2 Class EA Project Classification

This Master Plan is being undertaken in accordance with Approach #2 of the Master Planning Process, as outlined in Appendix 4 of the Municipal Class EA document (2023). Master plans are long-range plans which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles. These plans examine an infrastructure system(s) or group of related projects in order to outline a framework for planning for subsequent projects and/or developments. This report fulfills the requirements of Schedule B projects identified through the Master Planning process.

This SWMP process will be completed for Stage 1, Stage 2 and Stage 3. Three separate, independent Master Plans will be completed, where each will evaluate alternative solutions to stormwater management issues within a different stormwater catchment area. Each report will have preferred solutions that are not interdependent on the preferred solutions in the adjacent stormwater catchment areas. Each report will fulfill the requirements of Schedule B projects.

2.3 Comments and Request for Higher Level of Study

Interested persons may provide written comments to the Town of LaSalle for a response using the following contact information:

Peter Marra, P.Eng.
Deputy Chief Administrative Officer
Town of LaSalle
5950 Malden Road
LaSalle, ON N94 1S4
Tel: 519-519-969-7770 ext. 1475
Email: pmarra@lasalle.ca



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In addition, a request may be made to the Ministry of the Environment, Conservation and Parks for an order requiring a higher level of study (i.e., requiring an individual/comprehensive EA approval before being able to proceed), or that conditions be imposed (e.g., require further studies), only on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on constitutionally protected Aboriginal and Treaty Rights. Requests on other grounds will not be considered. Requests should include the requester contact information and full name for the ministry.

Requests should specify what kind of order is being requested (request for additional conditions or a request for an individual/comprehensive environmental assessment), how an order may prevent, mitigate or remedy those potential adverse impacts, and any information in support of the statements in the request. This will ensure that the ministry is able to efficiently begin reviewing the request. The request should be sent in writing by mail or by email to:

Minister of the Environment, Conservation and Parks
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

Requests should also be sent to Town of LaSalle by mail or by email.

2.4 Communications and Consultation Plan

Consultation is a vital part of the Class EA process. Active engagement with all potentially affected parties including government agencies, community members, special interest groups, and Indigenous communities ensures a transparent and responsible planning process.

At the initiation of the project, a mailing list was created which includes relevant Federal and Provincial government agencies, local government officials, Indigenous Communities, special interest groups, landowners and developers. Those who expressed interest were also included on the mailing list. Project notifications were emailed to the study contact list, mailed to local residents within the Study Area, and posted on the Town of LaSalle's PlaceSpeak website



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(<https://www.placespeak.com/en/topic/6535-lasalle-detroit-river-storm-sewer-outfalls/#/overview>).

2.5 Notice of Study Commencement

The Notice of Study Commencement and Notice of Public Information Centre (PIC) was issued on May 31, 2023. The notice was emailed to the study contact list, mailed to residents in the Study Area, and posted on the Town of LaSalle's website.

PICs serve as forums for two-way communication between the project team and members of the public. A PIC was held in-person at the LaSalle Civic Centre (5950 Malden Road, LaSalle, ON) on June 20, 2023, from 4:00pm to 7:00pm. Project materials were also made available on the Town's website, with a pre-recorded presentation available for public review. The PIC focused on the Stage 2 catchment area.

The purpose of the PIC was to present:

- Alternative solutions for improvements to the Stage 2 catchment area.
- Evaluation of alternative solutions.
- Recommended solutions.
- Next steps and project milestones.

PICs will be planned for subsequent stages of the SWMP project. Stage 3 PIC is tentatively planned for 2024 and will focus on the improvements to the Stage 3 catchment area, along Front Road between Victory Street and Malden Road.

2.6 Agency and Stakeholder Consultation

The notices were sent to relevant agencies and stakeholders to solicit feedback on the project. No comments or concerns were raised by agencies and stakeholders. A list of the agencies and stakeholders is provided below.

Provincial/Federal

- Ministry of Natural Resources and Forestry
- Ministry of Environment, Conservation and Parks
- Ministry of Citizenship and Multiculturalism
- Ministry of Transportation
- Ministry of Agriculture, Food, and Rural Affairs
- Ministry of Indigenous Relations and Reconciliation
- Department of Fisheries and Oceans Canada



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Municipal

- City of Windsor
- Town of Amherstburg
- Town of Tecumseh
- County of Essex
- Town of LaSalle Fire Services
- Town of LaSalle Police

Agencies

- Essex Region Conservation Authority
- Hydro One
- Essex Power Corporation
- Enwin Utilities
- Enbridge
- Cogeco Cable
- Bell Canada
- Greater Essex County District School Board
- Windsor-Essex Catholic District School Board
- Conseil Scolaire de District des Ecoles Catholiques du Sud-Ouest
- Canadian Pacific Railway
- Canadian National Railway
- Essex Terminal Railway
- Essex Golf and Country Club
- Student Transportation Services

2.7 Indigenous Community Engagement

Notices were sent with a cover letter to the following Indigenous communities:

- Metis Nation of Ontario
- Chippewas of the Thames First Nation
- Oneida Nation of the Thames
- Munsee-Delaware Nation
- Delaware Nation
- Bkejwanong Territory (Walpole Island First Nation)
- Caldwell First Nation
- Chippewas of Kettle and Stony Point First Nation
- Aamjiwnaang First Nation



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The following comments were received from Indigenous communities:

- Chippewas of the Thames First Nation requested to be notified if an Archaeology Assessment is conducted. The project team notified Chippewas of the Thames First Nation that a Stage 1 Archaeological Assessment will not be required as part of this study.
- Caldwell First Nation requested to review the SWMP report once completed.

Indigenous communities were contacted on February 22, 2024 by email and phone to notify them of the upcoming Master Plan report being prepared for this study. One comment was provided by Chippewas of the Thames First Nation on March 13, 2024, related to the recommendation to rely on the Town of LaSalle residents to perform upgrades on their own drainage systems. The Town of LaSalle responded on April 4, 2024, noting no concerns were raised by residents at the PIC's regarding these recommendations, and the participation of the residents is not required to prevent systemic flooding; the recommendations are to enhance flooding protection for individual lots, on an as need basis. No other comments were received.

Copies of the notification materials and all relevant correspondence are provided in **Appendix A**.

2.8 Public Consultation

One comment was provided by a member of the general public, providing support for the Town's undertaking of the study. A copy of the correspondence is provided in **Appendix A**.



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3.0 Planning and Policy Context

3.1 Planning Policies

3.1.1 Canadian Environmental Assessment Act

The *Canadian Environmental Assessment Act* (2012) focuses federal environmental review on projects which have the potential to cause significant adverse environmental effects in areas of federal jurisdiction. For the *Act* to apply, the proposed project must be designated under the “Regulations Designating Physical Activities” and specifically be listed in the “Schedule for Physical Activities”. Review of the Schedule for Physical Activities shows there is no physical activity that matches the work proposed for the construction of pumping stations and sewers. Therefore, meeting the requirements of the *Canadian Environmental Assessment Act* will not be necessary for this project.

3.1.2 Fisheries Act

The federal Fisheries Act (1985) is the primary legislation governing fish and fish habitat in Canada. The Fisheries Act defines fish habitat as “...waters frequented by fish and any other areas on which fish depend directly or indirectly in order to carry out their life processes including spawning grounds and nursery, rearing, food supply and migration areas.” The fish and fish habitat protection provisions of the Fisheries Act apply to all fish and fish habitat in Canada. The Act prohibits activities that result in the death of fish or the harmful alteration, disruption or destruction (HADD) of fish habitat unless authorized by the Minister of Fisheries, Oceans and the Canadian Coast Guard. If it is determined that the death of fish or HADD of fish habitat is unavoidable as part of the Project, an authorization under the Fisheries Act may be required.

3.1.3 Species At Risk Act

The *Species at Risk Act* (SARA) identifies wildlife species considered to be at risk in Canada and designates them as threatened, endangered, extirpated or of special concern. Species at Risk (SAR) are identified and assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which is an independent committee of wildlife experts and scientists that makes recommendations to the federal government regarding the status of wildlife species in Canada.

The purpose of SARA is to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened.



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The protection and conservation measures afforded by SARA apply to those species identified on Schedule 1 of the *Act*. Other species identified by COSEWIC as SAR that required further assessment in accordance with current assessment criteria are identified on Schedule 2 (Endangered and Threatened) and Schedule 3 (Special Concern) of the *Act*. All listed (Schedule 1) aquatic species and migratory birds in Canada are protected by SARA. Remaining listed species (plants, mammals, reptiles, amphibians) are only protected where they occur on federal lands (i.e., National Parks, First Nations Reserves).

Any activity affecting a listed species, or its critical habitat requires the prior issuance of a permit from the applicable agency, either Environment and Climate Change Canada or Fisheries and Oceans Canada (DFO). Permits may only be issued for scientific research relating to the conservation of the species, where activities are required to benefit a species or to enhance its chances of survival or for incidental impacts. Efforts to avoid, reduce, or minimize impacts must first be employed and activities will not be permitted if they would jeopardize the survival or recovery of the species.

3.1.4 The Planning Act

The *Planning Act, R.S.O. 1990, c.P13* sets the framework for land use planning in Ontario. According to the provisions within the *Act*, the Province of Ontario is the primary authority for planning matters in Ontario, and the *Act* enables the Province to delegate some of its planning authority to the upper-tier municipalities (i.e., counties and regional/district municipalities, and planning boards) while retaining control through the approval process. Municipalities must conform to approved policies of the Provincial government and its agencies. Provincial ministries, municipal councils, planners, and other stakeholders implement the *Act* when they undertake certain actions, including:

- Preparing Official Plans and planning policies that guide future development considering provincial interests, such as protecting and managing natural resources;
- Regulating and controlling land uses through zoning by-laws and minor variances; and
- Dividing land into separate lots for sale or development through Plans of Subdivision or a Land Severance.

This study considers development applications approved under the *Planning Act* and associated conditions of approval along with lands designated for future development within the Town of LaSalle.



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3.1.5 Provincial Policy Statement

The *Provincial Policy Statement (PPS)* (2020), issued under Section 3 of the *Planning Act*, sets a policy foundation for regulating the development and use of land. It provides direction on matters of provincial interest and supports the enhancement of the quality of life for all citizens of Ontario, while still maintaining environmental integrity. In accordance with Section 3 of the *Planning Act*, decisions affecting planning matters shall have regard for the PPS. The PPS establishes a framework to build strong communities while ensuring development patterns are efficient and optimize the use of land, resources, and public investment in infrastructure.

Policies relevant to water infrastructure include the requirement for infrastructure to be provided in a coordinated, efficient, and cost-effective manner that considers impacts from climate change while accommodating projected needs (Policy 1.6.1). These systems are meant to minimize erosion and changes in water balance and prepare for the impacts of a changing climate through the effective management of stormwater, including the use of green infrastructure (Policy 1.6.6). The service shall promote the efficient use and optimization of existing services, ensure the systems are reliable, promote efficiency, and integrate land use considerations throughout the process. The preferred alternatives and supporting recommendations will meet the objectives of the PPS by providing for infrastructure that is appropriate to address projected needs, protects the natural environment and protects public health and safety.

3.1.6 Endangered Species Act

The *Endangered Species Act (ESA)* (2007) identifies wildlife species considered to be at risk in Ontario and designates them as threatened, endangered, extirpated or of special concern. Provincial species at risk are identified and assessed by the Committee on the Status of Species at Risk in Ontario (COSSARO) which is a committee of wildlife experts and scientists, as well as those who provide Indigenous traditional knowledge, that classify species according to their degree of risk based on the best available scientific information, community knowledge and Indigenous traditional knowledge. When COSSARO classifies a species at risk, that classification applies throughout Ontario, unless otherwise noted.

The ESA protects species at risk and their habitats by prohibiting anyone from killing, harming, harassing or possessing protected species, as well as prohibiting any damage or destruction to the habitat of species identified on the Species at Risk in Ontario (SARO) list. Species listed as threatened or endangered on the SARO list are provided with general habitat protections under the *ESA*, which protect areas that species depend on to carry out their life processes, such as reproduction, rearing, hibernation, migration, or feeding.



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Activity that may impact a protected species or its habitat requires the prior issuance of a permit from the MECP. Such permits may only be issued under certain circumstances, which are limited to activities required to protect human health and safety, activities that will assist in the protection or recovery of the species, activities that will result in an overall benefit to the species or activities that may provide significant social or economic benefit without jeopardizing the survival or recovery of the species in Ontario.

A permit may be issued under Section 17(2) of the ESA or eligible activities can be registered under Ontario Regulation 242/08 to authorize work that is otherwise prohibited. Consultation with the ministry is recommended early in detailed design and prior to the works starting to ensure compliance with the ESA.

3.1.7 Climate Change

The MECP's guide, *Consideration of Climate Change in the Environmental Assessment Process*, outlines two approaches for considering and addressing climate change in project planning, including:

- Reducing a project's impact on climate change (climate change mitigation measures).
- Increasing the project's and local ecosystem's resilience to climate change (climate change adaptation).

As part of this study, the objectives of the climate change document have been considered and incorporated into the generation and evaluation of alternatives and mitigation measures.

3.1.8 Drainage Act

Municipal drains are created under the authority of the *Drainage Act*. Once a municipal drain has been constructed under the authority of a by-law, it becomes part of the municipality's infrastructure. The local municipality is responsible for repairing and maintaining the drain.

3.1.9 Essex Region Conservation Authority Regulation 158/06

The *Conservation Authorities Act* (CAA) was created with the purpose of conservation, restoration, development, and management of natural resources in watersheds in Ontario. The CAA is now administered by the MECP. The Ministry of Natural Resources and Forestry (MNR) is responsible for conservation authorities' activities related to natural hazard management. Conservation Authorities are enabled with regulatory responsibility within their respective jurisdictions. The Essex Region Conservation Authority (ERCA) is the CAA regulatory agency for the Study Area.



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Under Ontario Regulation 158/06, ERCA reviews projects and implements their permitting process to achieve the following under the CAA:

- Prevent the loss of life and property due to flooding and erosion.
- Prevent pollution.
- Conserve and enhance natural resources.

The regulation applied to fill placement and removal or site grading, flood prone areas, erosion prone areas, dynamic beach areas, alteration of watercourses, and interference with wetlands.

While considering projects during the review process, ERCA determines if projects are consistent with various policies and guidance documents, such as the *Windsor/Essex Region Stormwater Management Standards Manual* (Stantec 2018), which provides direction for the protection of natural hazards during the stormwater management planning process.

3.1.10 Essex Region Stormwater Management Standards Manual

In 2018, on behalf of the Windsor/Essex Region municipalities, the ERCA prepared the *Windsor/Essex Region Stormwater Management Standards Manual* to provide a clear, concise and consistent approach to stormwater design within the Region. The purpose of the manual was to identify the general policies and technical guidelines adopted by regulatory agencies and provide direction for the development and review of technical reports in support of new development. This manual has been reviewed, and techniques have been referenced as part of this study.

3.1.11 Essex Region Source Protection Plan

In accordance with Ontario's *Clean Water Act* (CWA), the ERCA has developed the Essex Region Source Protection Plan (SPP) to protect groundwater sources within the jurisdiction. The SPP policies work to reduce risk by regulating proposed and existing activities which have been identified as posing significant threats to drinking water safety. Depending on the hydrology and geology of an area, as well as potential risks posed by activities onsite, different policies under the SPP may apply to the Study Area. Impacts to the SPP policies will be identified through the evaluation of alternative solutions.

The Essex Region SPP policies may come into effect during the design and construction phases of the project, should the preferred alternative involve activities which are deemed significant threats under Ontario's CWA and the SPP. Such significant threats include, but are not limited to, the storage of salt over 1 tonne, storage and handling of organic solvents and/or dense non-aqueous phase liquids.



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MECP mapping identifies Event Based Areas and Significant Groundwater Recharge Areas within the Stage 2 Study Area. The Event Based Area is an area where modeling has demonstrated that a spill from a specific activity can or could cause deterioration to the raw water quality at the drinking water system intake. Significant Groundwater Recharge Areas 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. Mitigation measures to ensure the protection of these areas will be identified during the design and construction phases.

3.1.12 Town of LaSalle Official Plan

The Town of LaSalle Official Plan was developed in 2018 and guides future growth to meet the needs of the community. The plan provides direction until the year 2038, on matters related to land use planning and growth, and provides direction to protect and enhance the quality of life in the Town of LaSalle. The Official Plan promotes sustainability; healthy, livable and complete communities; and a strong economy.

The Official Plan identifies stormwater runoff facilities which enter into the drainage systems, which ultimately lead into the Town's natural areas, Detroit River and Turkey Creek. The Official Plan recognizes the need to ensure that these systems are properly managed to protect water quality, fish and wildlife habitat, and to prevent erosion and flooding. Provincially Significant Wetlands (PSW) and terrestrial features are identified in the Official Plan.

The Official Plan identifies lands within the Stage 2 Study Area as Residential lands, as well as Detroit River Floodprone Areas, which are susceptible to flooding as a result of Detroit River water levels. Future development within these areas are subject to setbacks and minimum elevations determined by ERCA.

3.1.13 Dilapidated Culvert Replacement Policy

The *Dilapidated Culvert Replacement Policy* allows the Town to maintain and keep in a proper state of repair, the drainage system on Town owned property and/or municipal rights-of-way (ROW). Specifically, the policy is for the replacement of dilapidated culverts within drainage systems under driveways, or culverts of privately initiated previously installed drain infills. The policy provides drainage for roads, private property abutting the public ROW, and for private property that discharges/connects into drainage systems. The policy applies to all Town owned drainage systems located on Town property.



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4.0 Existing Conditions

4.1 Socio-Economic

The Town of LaSalle Official Plan is a guiding document for directing growth and change in the Town for the next 20 years, to 2038. The Plan provides direction on land use planning and growth and promotes the Provincial policy-led planning system. Land within the Stage 2 Study Area falls within the Residential District. The Residential District includes an array of housing and building types, as well as uses that support neighbourhood living.

The Town of LaSalle storm sewer outfalls will need to be able to accommodate these districts, and the anticipated development within the area.

4.2 Natural Environment Overview

Stantec completed a background review of natural environment features, including designated natural areas, fish communities and fish habitat, and potential SAR and Species of Conservation Concern (SOCC).

A number of background documents and information sources were consulted to identify natural heritage features for the Study Area. Data was compiled in a GIS database to support mapping and data query requirements of the natural heritage assessment.

For the potential occurrence of SAR or SOCC, the following sources were consulted for recent (1990-present) records in the vicinity of the Study Area:

- Natural Heritage Information Centre (NHIC) Biodiversity Explorer database (MNRF 2022). Atlas of the Mammals of Ontario (Dobbyn 1994).
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019).
- Ontario Breeding Bird Atlas (Cadman et al. 2007).
- Species at Risk in Ontario List (MECP 2022).
- eBird Online Database (eBird 2021).
- iNaturalist Online Database (iNaturalist 2021).
- Fisheries and Oceans Canada – Aquatic Species at Risk Map (DFO 2019).
- Essex Region Conservation Authority.

The above sources are used as indicators of potential occurrence in the Study Area because they do not identify specific locations of species occurrences.



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4.2.1 Field Investigation

The purpose of the field visit was to supplement background data and refine the boundaries of features where applicable. One field visit was completed on April 13, 2021, and included Ecological Land Classification (ELC), wildlife and wildlife habitat assessments, and an aquatic habitat assessment.

Investigations were completed on all publicly accessible lands. For all other lands, observations were made from the edge of private property and road ROW, where available.

Supplementary observations that were documented during fieldwork completed as part of the natural heritage studies for the LaSalle Small Coast Experience project have been included in this report. Those supplementary observations took place on July 9 and August 25, 2021.

4.2.2 Wildlife and Wildlife Habitat

The Study Area was assessed to identify Significant Wildlife Habitat types known to occur within Ecoregion 7E. Candidate features were identified using a combination of ELC and other guidance provided in the Ecoregion Criteria Schedule (MNRF 2015), and incidental wildlife observations. Wildlife (birds, reptiles, insects) were noted incidentally during the site investigation. Species, number of individuals and notes on habitat and behaviour were recorded.

4.2.3 Fish and Fish Habitat

An aquatic habitat assessment was conducted on April 13, 2021, and consisted of an investigation of watercourses and potential watercourses within the Study Area for each of Stages 1-3.

Characterization of aquatic habitat was based on the presence/absence of key aquatic habitat features. The survey consisted of a general description of watercourses, (i.e., dimensions, bank stability, morphology), identification of features that typically contribute to fish habitat (i.e., in-water and riparian cover, substrate) and documentation of fish observations. Assessments did not include a fish community survey and were conducted from locations with public access. Field and background data were used to identify potential fisheries and aquatic habitat constraints.

4.2.4 Provincial Status and Sensitivity

Background data and field data were evaluated to determine the significance of natural heritage features associated with the Study Area. The provincial status of vegetation communities, plants and wildlife was determined by reviewing the NHIC database



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(MNR 2021b). Provincial or Sub-national status rankings (S-Ranks) are based on the number of occurrences in Ontario and have the following meanings:

- S1:** critically imperiled; often fewer than 5 occurrences.
- S2:** imperiled; often fewer than 20 occurrences.
- S3:** vulnerable; often fewer than 80 occurrences.
- S4:** apparently secure and common.
- S5:** secure and very common.
- S?:** unranked or, if following a ranking, rank uncertain (e.g., S3?).

The potential sensitivity of natural heritage features and functions, such as existing wetlands and watercourse functions, was also measured through an assessment of:

- Vegetation communities (habitat quality, floral quality index, degree of disturbance).
- Sensitive species (plants with a high coefficient of conservatism value).
- Patch size.
- Potential linkage and corridor functions.

4.2.5 Ecological Setting, Physiography and Land Use

The community of LaSalle is in Ecoregion 7E and within the Detroit River subwatershed. The underlying physiography is sand plain.

The Study Area is in the Niagara section of the Deciduous Forest Region (Rowe 1972), also known as the Carolinian Forest. Forests in this region are dominated by broadleaved trees including sugar maple, American beech, basswood, red maple, red oak, white oak, and bur oak, butternut, bitternut hickory, rock elm, silver maple and blue beech. Species such as black cherry, black walnut, sycamore, swamp white oak, and shagbark hickory are also occasionally present. Species considered rare to the province, such as pignut hickory, tulip-tree, chinquapin oak, pin oak, black oak, black gum, blue ash, cucumber-tree, paw, Kentucky coffee-tree, red mulberry and sassafras are sporadically present in the forest region. Coniferous trees such as hemlock, white pine, tamarack, eastern white cedar, eastern red cedar and black spruce may be found in isolated patches where soil conditions are favorable.

4.2.6 Recent Species Records

There were 186 species at risk (SAR) (i.e., species listed on the SARO list) or Species of Conservation Concern (SOCC) (i.e., S1-3 species identified in the background review in the vicinity of the Study Area).



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A description of each species, scientific name, designated status, record source, habitat requirements, potential occurrence of habitat and likelihood of occurrence in the Study Area is documented in **Appendix B**.

4.3 Natural Environment - Stage 2 Catchment Area

4.3.1 Designated Natural Areas

4.3.1.1 Wetlands

The Ontario Wetland Evaluation System is used to identify PSWs. Evaluated wetlands that do not qualify as provincially significant may be designated as locally significant and may be protected through local planning and policy measures. There may also be unevaluated wetlands in an area.

Two PSWs are located within Stage 2 which includes: Detroit River and Detroit River Marshes (MNR 2021a; MNR 2021b).

4.3.1.2 Significant Woodlands

A woodland is defined as a treed area, woodlot or forested area. The Natural Heritage Reference Manual notes that the local planning authority has a responsibility for designating significant woodlands (MNR 2010).

The Essex County OP (2014) defines significant woodlands as “All woodlands 2 hectares in size or larger using the size criteria recommended in the Natural Heritage Reference Manual (MNR 2010) and as per the Essex Region Natural Heritage System Strategy. Smaller woodlands may be considered significant if they exhibit composition, age or quality that is uncommon in the municipality or the region.”

Significant woodlands were identified within the Stage 2 Study Area.

4.3.1.3 Significant Valleylands

Valleylands are linear natural areas that occur in a valley or other landform depression that have water flowing through or standing for some period of the year (MNR 2010).

Significant valleylands were identified associated with the Marentette Drain within the Stage 2 Study Area through the Town of LaSalle Official Plan Review -Update to the Candidate Natural Heritage Inventory (CNHAI; ERCA 2010).

4.3.1.4 Areas of Natural and Scientific Interest

Life science ANSIs are significant representative segments of Ontario’s biodiversity and natural landscapes, including specific types of forests, valleys, prairies, savannahs, alvars and wetlands, their native plants and animals, and their supporting environments.



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A single life science ANSI, the Reaume Prairie, was identified in the Stage 2 Study Area (MNRD 2021a; MNRD 2021b).

4.3.1.5 Other Designated Natural Areas

The Study Area is located within the Lower Detroit River Important Bird and Biodiversity Area (IBA) which recognizes globally significant congregator species, waterfowl concentrations, colonial waterbirds/seabird concentrations, and nationally significant congregatory species (IBA Canada 2021).

Stage 2 is located within Lower Detroit River IBA (IBA Canada 2021). There are ERCA regulated areas throughout the Study Area.

4.3.2 Vegetation Communities

Forty-seven vegetation community types were identified within the Study Area, including 36 natural or naturalized communities, three agricultural communities, three greenlands, and five constructed communities.

The following ELC communities were in the Stage 2 area:

- Meadow Marsh / Shallow Marsh
- Graminoid Mineral Meadow Marsh Ecosite
- Graminoid Mineral Shallow Marsh Ecosite
- Open Water
- Open Aquatic
- Open Aquatic / Shallow Marsh
- Deciduous Swamp
- Oak Mineral Deciduous Swamp Type / Fresh – Moist Oak – Maple – Hickory – Deciduous Forest Ecosite
- Swamp White Oak Mineral Deciduous Swamp Type
- Pin Oak Mineral Deciduous Swamp Type
- Pin Oak Mineral Deciduous Swamp Type / Fresh – Moist Sassafras Deciduous Forest Type
- Pin Oak Mineral Deciduous Swamp Type / Fresh – Moist Oak – Maple – Hickory Deciduous Forest Ecosite
- Shumard's Oak Mineral Deciduous Swamp Type
- Gray Dogwood Mineral Deciduous Thicket Swamp Type
- Mixed Meadow
- Fresh – Moist Mixed Tallgrass Prairie Ecosite
- Dry – Fresh Mixed Meadow Ecosite
- Fresh – Moist Mixed Meadow Ecosite
- Fresh – Moist Mixed Meadow Ecosite / Open Aquatic
- Deciduous Thicket



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- Deciduous Thicket / Dry – Fresh Mixed Meadow Ecosite
- Fresh – Moist Oak Tallgrass Woodland Type
- Dry-Fresh Black Oak Deciduous Forest
- Dry-Fresh Sugar Maple Deciduous Forest Ecosite
- Fresh – Moist Sassafras Deciduous Forest Type
- Fresh – Moist Oak – Maple – Hickory – Deciduous Forest Ecosite
- Fresh – Moist Oak – Maple Deciduous Forest Type
- Agriculture
- Coniferous Plantation
- Golf Course
- Parkland
- Recreational
- Commercial and Institutional
- Transportation
- Residential

There were two provincially rare vegetation communities in the Stage 2 Study Area (ERCA 2010): Fresh – Moist Mixed Tallgrass Prairie Ecosite (MEMM2) and Fresh – Moist Oak Tallgrass Woodland Type (WODM6-1). These two communities support many plant and wildlife SAR and SOCC, identified below:

Table 1: Significant Species within Fresh-Moist Mixed Tallgrass Prairie Ecosite

Common Name	Latin Name	Provincial S-Rank	SARO Status	SARA Schedule 1
Eastern Foxsnake (Carolinian)	<i>Pantherophis gloydi</i>	S2	END	END
Chimney Swift	<i>Chaetura pelagica</i>	S4B, S4N	THR	THR
White Colicroot	<i>Aletris farinose</i>	S2	END	END
Butternut	<i>Juglans cinerea</i>	S2?	END	END
Dense Blazing-star	<i>Liatris spicata</i>	S2	THR	THR
Purple Twayblade	<i>Liparis liliifolia</i>	S2S3	THR	THR
Willow-leaved Aster	<i>Symphothyrium praealtum</i>	S2	THR	THR
Large-flowered Purple False Foxglove	<i>Agalinis purpurea</i> var. <i>purpurea</i>	S1		
Slim-spike Threawn Grass	<i>Aristida longespica</i> var. <i>longespica</i>	S2		



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Table 1: Significant Species within Fresh-Moist Mixed Tallgrass Prairie Ecosite

Common Name	Latin Name	Provincial S-Rank	SARO Status	SARA Schedule 1
Purple Milkweed	<i>Asclepias purpurascens</i>	S1		
Field Sedge	<i>Carex conoidea</i>	S3		
Pignut Hickory	<i>Carya glabra</i>	S3		
Tall Tickseed	<i>Coreopsis tripteris</i>	S1S2		
Slender Fragrant Goldenrod	<i>Euthamia caroliniana</i>	S1		
Pumpkin Ash	<i>Fraxinus profunda</i>	S1		
Eastern Yellow Stargrass	<i>Hypoxis hirsuta</i>	S2S3		
Two-flowered Dwarf-dandelion	<i>Krigia biflora</i>	S2		
Hairy Pinweed	<i>Lechea mucronate</i>	S3		
Bushy Seedbox	<i>Ludwigia alternifolia</i>	S1		
Winged Loosestrife	<i>Lythrum alatum</i>	S3		
Black Gum	<i>Nyssa sylvatica</i>	S3		
Gray-headed Prairie Coneflower	<i>Ratibida pinnata</i>	S3		
Climbing Prairie Rose	<i>Rosa setigera</i>	S2S3	SC	SC
Tall Nutrush	<i>Scleria triglomerata</i>	S1		
White Blue-eyed-grass	<i>Sisyrinchium albidum</i>	S1		
Riddell's Goldenrod	<i>Solidago riddellii</i>	S3	SC	SC
Skunk Meadow-rue	<i>Thalictrum amphibolum</i>	S3		
Giant Ironweed	<i>Vernonia gigantea</i>	S1?		
Culver's Root	<i>Veronicastrum virginicum</i>	S2		
Southern Cloudywing	<i>Thorybes bathyllus</i>	S3		
Monarch	<i>Danaus plexippus</i>	S4B, S2N	SC	SC
Large-flowered Purple False Foxglove	<i>Agalinis purpurea</i> var. <i>purpurea</i>	S1		



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Table 1: Significant Species within Fresh-Moist Mixed Tallgrass Prairie Ecosite

Common Name	Latin Name	Provincial S-Rank	SARO Status	SARA Schedule 1
Pignut Hickory	<i>Carya glabra</i>	S3		
Tall Tickseed	<i>Coreopsis tripteris</i>	S1S2		
Winged Loosestrife	<i>Lythrum alatum</i>	S3		
Gray-headed Prairie Coneflower	<i>Ratibida pinnata</i>	S3		
Climbing Prairie Rose	<i>Rosa setigera</i>	S2S3	SC	SC
Eastern Stiff-leaved Goldenrod	<i>Solidago rigida</i> ssp. <i>rigida</i>	S3		
Giant Ironweed	<i>Vernonia gigantea</i>	S1?		

4.3.3 Significant Wildlife Habitat

Site-specific investigations to identify species use of wildlife habitat and confirm SWH was beyond the scope of this study, but additional investigations can be undertaken at the detail design phase if needed.

Wildlife habitat includes habitat for species listed as Special Concern or ranked provincially rare (S1-S3) and the four categories of SWH. Presence or absence of candidate SWH is discussed below.

Seasonal concentration areas are sites where large numbers of a species gather at one time of the year, or where several species congregate. Only the best examples of these concentration areas are typically designated as SWH. Review of the NHIC and LIO databases did not identify any confirmed seasonal concentration areas within the Study Area. Candidate SWH for seasonal concentration areas was present in the Study Area and is summarized below.

- Aquatic waterfowl stopover and staging habitat.
- Shorebird migratory stopover habitat.
- Raptor wintering area.
- Bat maternity colonies.
- Turtle wintering area.
- Snake hibernaculum.
- Colonial-nesting bird breeding habitat.



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4.3.3.1 Rare Vegetation Communities or Specialized Habitats for Wildlife

Rare Vegetation Communities or Specialized Habitats for Wildlife are defined as separate components of SWH. Rare habitats are habitats with vegetation communities that are considered rare (S1-S3) in the province. These habitats are generally at risk and may support wildlife species that are considered significant. Specialized habitats are microhabitats that are critical to some wildlife species. Candidate habitat for rare vegetation communities or specialized habitats for wildlife observed in the Study Area are summarized by phase below.

- Savannahs.
- Tall-grass prairies.
- Bald Eagle and Osprey nesting, foraging and perching habitat.
- Seeps and springs.
- Amphibian breeding habitat.

4.3.3.2 Habitat for Species of Conservation Concern

Habitat for species of conservation concern includes four types of species: those that are rare, those whose populations are significantly declining, those that have been identified as being at risk to certain common activities, and those with relatively large populations in Ontario compared to the remainder of the globe. Habitat for Special Concern and Rare Wildlife (S1-S3 ranked species, including provincially designated Special Concern species) that were identified during the background review with potential to occur in the Study Area are summarized below.

- Marsh bird breeding habitat.

4.3.4 Fish and Fish Habitat

Fish habitat was assessed at watercourses within the Study Area for Stages 1 to 3. Watercourses were given an identifier (ex. WC-1). Results of the fish habitat assessments are provided below.

There are eight mapped watercourses within the Stage 2 catchment area. Two of the watercourses (WC-3, WC-5) were confirmed to provide fish habitat as fish were observed during the field assessment. All the watercourses within the Stage 2 area are classified as municipal drains and all were modified for agricultural or municipal drainage purposes under the Drainage Act. Some of the watercourses have open channel flow with sections that are piped underground, and some are completed piped underground. Only four of the watercourses in the Stage 2 area could be assessed in the field due to land access restrictions.



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WC-3 Marentette Drain – The Marentette Drain is a highly modified and permanently flowing watercourse. The watercourse begins on the west side of Malden Road and ends at its confluence with the Detroit River. The watercourse is considered a municipal drain and has been identified as a DFO Drain Class C (OMAFRA 2020). Watercourses with DFO Drain Class C have a permanent flow, and no sensitive fish species present (DFO 2017). The watercourse flows through residential, agricultural and forested land uses. The entire watercourse has been straightened with some sections piped underground and some sections exhibiting open channel flow. The drain provides fish habitat and is mapped to support two SOCC fish species including the Northern Sunfish and Spotted Sucker (DFO 2022). The SOCC habitat is mapped from the confluence with the Detroit River to Front Road, however aquatic SOCC may also utilize habitat upstream from Front Road. At Front Road, the Marentette Drain was a wide and slow flowing channel with flat morphology and an estimated 7 m wetted width and greater than 1 m depth. Water clarity was poor due to high turbidity. In-water cover included small and large woody debris and emergent vegetation (phragmites) on the shoreline margins. Assessed in Gilbert Park, the channel wetted width was 1 m wide and 25 cm deep with fine mineral and organic debris substrates and minimal in-water cover or bank cover. A school of shiner species was observed in the channel in Gilbert Park. At Malden Road the watercourse had a channel wetted width of 70 cm and 15 cm depth and was flanked by manicured lawn.

WC-4 Lafferty Drain – The Lafferty Drain is considered a municipal drain and has a DFO Drain Class F (OMAFRA 2020). Watercourses with DFO Drain Class F have an intermittent flow (DFO 2017). The Lafferty Drain flow is piped underground and fish habitat is not present.

WC-5 North Branch Railway Drain - The North Branch Railway Drain had a straightened channel through a residential area. The channel began south of Sacred Heart Drive and was open up to north of Gary Avenue at which point it is piped underground. The watercourse is considered a municipal drain, and DFO Drain Class F (OMAFRA 2020). The open portion of the drain channel had a wetted width of 4 m, depth of 30 cm, and fine organic substrates. Fish habitat was confirmed in the open portion with observations of shiner species and yellow perch (*Perca flavescens*) south of International Avenue.

WC-6 Bessette Drain – The Bessette Drain flow is piped underground. Fish habitat is not present in Bessette Drain in the Study Area. Bessette Drain is considered a municipal drain and is DFO Drain Class F (OMAFRA 2020).

WC-7 Durocher Drain – Durocher Drain was not field assessed because access was not available. Durocher Drain is considered a municipal drain, and DFO Class NR (no rating) (OMAFRA 2020). Aerial imagery shows the Durocher Drain as an open channel entirely within an agricultural field, with the potential to connect with Marentette Drain.



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The Drain may provide fish habitat permanently, or seasonally, depending on the flow regime.

WC-8 Gignac Drain – The Gignac Drain was not field assessed because access was not available. Gignac Drain is considered a municipal drain, and DFO Class NR (OMAFRA 2020). Aerial imagery shows the Gignac Drain as an open channel beginning in an agricultural field, with potential to connect with Marentette Drain. The Drain may provide fish habitat permanently, or seasonally, depending on the flow regime.

WC-9 Chappus Drain – The Chappus Drain was not field assessed because access was not available. Chappus Drain is considered a municipal drain, and DFO Class F (NMNRF 2021a). Aerial imagery shows the Chappus Drain as mostly open channel with a section of underground piped flow under a residential area. The drain is a tributary to the Canard River and may provide fish habitat permanently, or seasonally, depending on the flow regime.

WC-10 St. Michaels Drain – Most of the St. Michaels Drain was not field reviewed because access was not available. Where the watercourse flows through natural areas there is open channel flow; however, along Matchette Road the watercourse flow is primarily piped underground. The St. Michaels Drain is considered a municipal drain, and DFO Class F (OMAFRA 2020). LIO (MNRF 2019a) data show SAR distribution in this drain (species not published), however, presence of aquatic SAR is not shown on DFO SAR Mapping (DFO 2022) for this watercourse. Fish habitat may be present where the drain has open channel flow.

4.3.5 Endangered and Threatened species

Species listed as endangered or threatened under the ESA were identified. A description of habitat preferences for each species and an assessment of habitat potential in the Study Area is on file with the Town of LaSalle, and provided in **Appendix B**.

4.4 Summary of Significant Natural Heritage Features

The review of background information combined with the results of the field investigation identified a number of natural heritage features within the Stage 2 catchment area. The following occurrences of significant natural heritage features in Stage 2 is listed below:

- Provincially Significant Wetlands.
- Significant Woodlands.
- Significant Valleylands.



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- Other Designated Natural Areas.
- Significant Wildlife Habitat.
- Areas of Natural & Scientific Interest.
- Fish Habitat.
- Habitat of endangered or threatened species (potential).

4.5 Existing Storm Sewer System

The existing storm sewer system in Stage 2 drains through multiple outlets into the Marentette Drain. The Marentette Drain connects directly to the Detroit River, and the entire subwatershed was modelled.

The majority of subdivisions and roads are drained by urban cross-sections consisting of curb and gutter with catch basins connected to storm sewers. A few streets are drained by roadside ditches which then connect into the storm sewers. Major system flows for most subdivisions make their way from the streets draining into the downstream drains that connect to the Marentette Drain and ultimately reach the Detroit River.

The total drainage area for the Stage 2 storm sewer system is approximately 450.4 hectares.

Through modelling analysis of the existing conditions, these sewers have been shown to be sized to generally accommodate the 5-year design storm.

The outfall of the Marentette Drain into the Detroit River is often submerged and there are no backwater preventers or pumps present. The majority of the Stage 2 system is far enough upstream that the backwater conditions are much less significant and is not cause for concern of higher flooding risk. Figure 4, found in **Appendix C**, shows the existing storm sewer system.



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5.0 Problem and Opportunity Statement

The first step in the Class EA process is to identify the problem or opportunity that led to the undertaking of the study. The Problem and Opportunity statement for the Town of LaSalle Detroit River Storm Sewer Outfalls Stormwater Master Plan study is as follows:

High water-levels in the Detroit River can backwater the system and reduce the available capacity for carrying stormwater. This can cause flooding on roadways and other surfaces when high river levels coincide with rainstorm events. Front Road in particular, has a history of overland flooding and roadway ponding. This is largely caused by record-breaking high-water levels in the Detroit River in 2019 and 2020, low surface topography and heavy rainfall events.

The main objective of the SWMP is to identify potential infrastructure improvements to protect public and private property from the effects of stormwater flooding while also protecting the natural environment.



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6.0 Alternative Solutions

As part of Phase 2 of the Class EA process, reasonable and feasible alternative solutions to the Problem and Opportunity Statement are identified. The framework and criteria for assessing the alternatives are also identified in order to determine the advantages and disadvantages with respect to the natural, social, technical and financial environments. Based on this evaluation, recommendations are identified and confirmed based on public, agency, and Indigenous community consultation. Mitigation measures are identified to offset any potential environmental impacts of the recommendations.

The following sections describe the potential alternative solutions that were considered and provides an overview of the evaluation process for each key issue.

Five alternative solutions were developed to determine the preferred solution for improvements to the Stage 2 catchment area. All five alternatives include the full-buildout conditions, which shows future residential areas as fully developed. Stormwater flows from these areas were controlled to the predeveloped flow rates for the modelled storm event to prevent an increase in the hydraulic grade line in the Marentette Drain or cause any increased ponding upstream. These alternatives underwent hydrotechnical analysis as part of the evaluation process, to understand the performance under existing and future conditions.

Alternative 1 – Do Nothing

This alternative maintains the future conditions in the Stage 2 area and is used for comparison purposes. No improvements to the storm system were made.

Alternative 2 – Upsize Sewers

This alternative proposes that the size of all existing storm sewers within the Stage 2 area be increased by 1.5 times their existing size.

Alternative 3 – Pump Stations

This alternative proposes the installation of storm pumping stations at 3 key locations sized to pass the 5-year storm flows.

Alternative 4 – Combined Solution

This alternative proposes a combination of measures: increasing storm sewer sizes in the Stage 2 catchment area, installation of 100-year flow storm pumping stations at three locations and replacing some culverts in the Marentette Drain that cause flow restrictions.



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Alternative 5 – Private Drainage Solutions

This alternative proposes property owners pursue private drainage improvements (i.e., maintain private drainage systems, improve conveyance, etc.).

6.1 Hydrotechnical Analysis

6.1.1 Calibration

A hydrologic and hydraulic computer model was created to evaluate existing and potential future conditions. Using information from the Town of LaSalle (engineering drawings, GIS files, aerial imagery, etc.), the initial PCSWMM model was created to simulate existing conditions within the Study Area. Initial model parameters were set based on typical values. Following the initial model setup for the project, model calibration was required based on observed local conditions.

AMG Environmental was part of the project team and installed flow gauges at a total of 8 monitoring locations. Gauges were installed on July 29, 2021, and removed on November 10, 2021, resulting in about three months of monitoring data. Three of these monitors were located in Stage 2. Due to submerged conditions in parts of the sewer network, flow monitoring was unavailable and only depths were recorded for one of the three monitors in this Stage.

The following section documents information and steps undertaken during the calibration exercise.

6.1.2 Flow Gauges

The monitors are listed below and shown on Figure 4 found in **Appendix C**:

1. J739 – located on Sacred Heart Drive upstream of the Lafferty Drain.
Contributing area: 23.4 ha.
2. J621 – located on Alfred Avenue upstream of the Lafferty Drain. (Depth gauge only)
Contributing area: 17.4 ha.
3. J573 – located on Lyons Avenue in an enclosed section of the Marentette Drain.
Contributing area: 47.2 ha.

During calibration, some inconsistencies were noted in the Lyons Avenue flow gauge. Upon further review, it was found that a blockage downstream causes submerged conditions at this location. For this reason, the J573 – Lyons flow gauge data was used for comparison only, and not for calibration.



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6.1.3 Rain Gauges

Two rain gauges were also installed within the Study Area (also shown on Figure 4 found in **Appendix C**). The LaSalle – Milford gauge, located on Milford Avenue just north of Reaume Road, and the LaSalle – Laurier gauge, located on Laurier Parkway just west of Disputed Road. Over the course of the monitoring period, the following four rainfall events were identified for calibration/validation purposes:

1. Calibration - September 21, 2021 (60-hour event) – total rainfall = 86.6 mm.
2. Calibration - October 24, 2021 (31-hour event) – total rainfall = 46.2 mm.
3. Calibration - October 29, 2021 (36-hour event) – total rainfall = 27.7 mm.
4. Validation - October 14, 2021 (43-hour event) – total rainfall = 30.7 mm.

The first three events were used for calibration and the fourth was used for validation. Rainfall hyetographs were downloaded from the Campbell Cloud site provided by AMG and converted into the appropriate format to be used as input to the PCSWMM model.

6.1.4 Boundary Conditions

To accurately calibrate the model, a downstream boundary condition was required to set the outlet to what was being experienced in the receiver during the calibration events. Detroit River water levels were obtained from the National Oceanic and Atmospheric Administration (NOAA) – Tides and Currents (<https://tidesandcurrents.noaa.gov/>). The closest station to the project location is located in Wyandotte, Michigan, which is approximately 4.5 km southwest of the Marentette Drain outlet on the Detroit River. From the review of the timeseries, it was determined that the approximate water level of the Detroit River during the calibration events was 175.1 m. This elevation was set as the fixed outlet elevation in the model. The time series boundary condition was not necessary for Stage 2 unlike in Stage 1 where the system was directly impacted by the Detroit River water levels. The Stage 2 system does not see a direct impact because it is separated from the Detroit River by over 1 km of the Marentette Drain.

6.1.5 Parameter Calibration

Once the boundary conditions were set, the three calibration events were run. It was clear that the model results follow the monitoring data during periods with no rainfall. To calibrate the peaks, a few parameters were identified that impact the peak depths. Table 2 provides a list of the parameters that were evaluated for calibration purposes and some of the adjustments that were made.

The two parameters that impact the results most significantly are the subarea routing and initial deficit measure. Table 2 shows a list of inputted model parameters.



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Subarea routing allows runoff from the subcatchments to be routed from impervious surfaces across pervious surfaces before entering the storm sewer network. This Study Area has some residential streets without curb and gutter, so catchbasins are often in the boulevard. It is also likely that many rooftop downspouts are disconnected from the sewers and would first spill onto the grass yards. Without a detailed inventory or additional field reconnaissance, it would be difficult to determine a precise percentage, so this value was estimated and adjusted based on the model outputs. For agricultural and undeveloped areas, the subarea routing was set to allow all runoff to route directly to the outlet, and flow lengths were adjusted based on the size of the subcatchment.

Runoff volumes are impacted by the antecedent moisture conditions of the soil (i.e., moisture conditions preceding the storm event). The soils in this area are mainly Colwood Fine Sandy Loam, with some spots of Berrien Sand. Both are Hydrologic Group C soils with similar infiltration parameters.

Table 2: Model Input Parameters

Parameter	Value	Comments
Flow length	50 m 100 m 20-700 m	50 m for the majority of residential & commercial subcatchments. Some subcatchments that have open ditches and no storm sewers were set to 100 m flow length since these open ditches were not modelled. Undeveloped subcatchments were set based on approximate flow time to the outlet (width of the subcatchment)
Slope	0.5%	Lowered slope since topography is very flat in this area.
Impervious	60% 10%	Residential Agricultural
Impervious Roughness (N Perv)	0.015	Adjusted slightly higher for rougher impervious areas
Previous Roughness (N Perv)	0.24	Typical value
Impervious Depression Storage (Dstore Imperv)	2.5 mm	Typical value
Pervious Depression Storage (Dstore Perv)	7.5 mm	Typical value



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Table 2: Model Input Parameters

Parameter	Value	Comments
Subarea Routing	50% to Previous	Used since many residential streets do not have curb & gutter, and likely many rooftop downspouts are disconnected from the sewers. Water from impervious areas will runoff to pervious before entering sewers.
Infiltration Parameters		
Suction Head	250 mm	Based on soil conditions
Conductivity	3.8 mm/hr	Based on soil conditions
Initial Moisture Deficit	0.13	Normal moisture condition

After applying these parameters and boundary conditions to the model, the results matched relatively closely to the observed data at all three Stage 2 monitoring locations. Model calibration and validation results are provided for each of the three outfall locations and each of the four rainfall events as shown in **Appendix C**.



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6.2 Evaluation of Alternative Solution

A qualitative evaluation process is used to determine the relative suitability of each alternative in accordance with a specific set of evaluation criteria. The criteria were developed to identify impacts to the natural, social, technical and financial environments to satisfy requirements under the EA Act.

6.2.1 Evaluation Criteria

Based on the review of background information and characterization of the Study Area, the criteria in Table 3 was identified for this study.

Table 3: Evaluation Criteria

Environmental Component	Evaluation Criteria	Description
Natural Environment	Terrestrial & Aquatic Habitat	<ul style="list-style-type: none"> • Potential to impact woodlots, vegetation, trees or landscape features • Potential to impact significant wildlife habitat, including Species at Risk (SAR) habitat • Potential to affect fish habitat
	Wildlife	<ul style="list-style-type: none"> • Potential to impact SAR and protected species
	Climate Change	<ul style="list-style-type: none"> • Ability to increase resiliency/adapt to climate change, and mitigate climate change through Greenhouse Gas (GHG) emissions
Social	Public Health and Safety	<ul style="list-style-type: none"> • Potential to improve resiliency of stormwater infrastructure and reduce risks of flooding
	Property Acquisition/Impacts	<ul style="list-style-type: none"> • Requires property acquisition for improvements • Permanent/ temporary property impacts
	Aesthetics	<ul style="list-style-type: none"> • Requires property acquisition for improvements • Permanent/temporary property impacts
	Impacts to Existing and Future Land Use	<ul style="list-style-type: none"> • Support future development within the Town of LaSalle • Facilities access to existing and future business operations



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Table 3: Evaluation Criteria

Environmental Component	Evaluation Criteria	Description
Cultural	Archaeological Resources	<ul style="list-style-type: none"> • Impacts sites containing archaeological potential and requires further investigation
	Built Cultural Resources & Landscapes	<ul style="list-style-type: none"> • Impacts to known built heritage sites/ known heritage landscapes
Technical	Constructability & Utilities	<ul style="list-style-type: none"> • Constructability considerations including phasing and the impact on existing utilities and services • Potential impacts of construction on existing traffic and/ or business operations
	Storm System Performance	<ul style="list-style-type: none"> • Storm sewer (minor system) capacity • Major system capacity • Performance under 2020 high water level conditions
Financial	Lifecycle costs	<ul style="list-style-type: none"> • Estimated capital cost • Estimated operation and maintenance costs

6.2.2 Evaluation Methodology

The framework and criteria for assessing alternative solutions are identified to determine the advantages and disadvantages with respect to the environmental, social, technical and financial components of the project. A detailed assessment of each alternative was completed based on the criteria outlined above, in addition to undergoing an analysis of performance under various water level conditions. A comparative evaluation matrix was further prepared and used to present the evaluation of treatment options as well as siting options. Each alternative solution was evaluated based on the above criteria and given an evaluation of *Least Preferred*, *Moderately Preferred*, or *Most Preferred*.

6.2.3 Evaluation of Alternative Solutions

A detailed evaluation of the alternatives was completed as part of the study and is available in Table 4.



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Table 4: Evaluation of Alternative Solutions

Factors and Criteria	Alternative 1 – Do Nothing	Alternative 2 – Upsize Sewers (1.5x)	Alternative 3 – Construct Three New Pump Stations	Alternative 4 – Combined Solution (Upsize Sewers & Three New Pump Stations)	Alternative 5 – Private Drainage Solutions
ENVIRONMENTAL					
Terrestrial & Aquatic Habitat <ul style="list-style-type: none"> • Potential to impact woodlots, vegetation, trees or landscaped features • Potential to impact significant wildlife habitat, including Species at Risk (SAR) habitat • Potential to affect fish habitat 	<ul style="list-style-type: none"> • No impacts to terrestrial and aquatic habitats as no construction/ upgrades would be completed. Conditions would remain as is. 	<ul style="list-style-type: none"> • No impacts to terrestrial and aquatic habitats as most construction/ upgrades would be contained within existing rights-of-way. 	<ul style="list-style-type: none"> • Minor impacts (relative to alternative 2) to terrestrial and aquatic habitats at the pump stations (e.g., 3 m x 3 m) as extent of construction/ upgrades would be very limited, and no natural habitats will be impacted. 	<ul style="list-style-type: none"> • Minor impacts (relative to alternative 2) to terrestrial and aquatic habitats at the pump stations (e.g., 3 m x 3 m) as extent of construction/ upgrades would be very limited, and no natural habitats will be impacted. Upsizing of the sewers would occur within the existing rights-of-way. 	<ul style="list-style-type: none"> • No impacts to terrestrial and aquatic habitats as improvements would occur by property owners, within private property.
Wildlife <ul style="list-style-type: none"> • Potential to impact SAR and protected species 	<ul style="list-style-type: none"> • No impacts to wildlife as no construction/ upgrades would be completed. Conditions would remain as is. 	<ul style="list-style-type: none"> • No impacts to wildlife as most construction/ upgrades would be contained within existing rights-of-way. 	<ul style="list-style-type: none"> • Low potential to impact SAR and protected species due to location on maintained municipal properties (manicured lawn). 	<ul style="list-style-type: none"> • Low potential to impact SAR and protected species due to location on maintained municipal properties (manicured lawn). 	<ul style="list-style-type: none"> • No impacts to wildlife as improvements would occur by property owners, within private property.
Climate Change <ul style="list-style-type: none"> • Ability to increase resiliency/adapt to climate change, and mitigate climate change through Greenhouse Gas (GHG) emissions 	<ul style="list-style-type: none"> • Low potential to reduce GHG emissions as infrastructure would remain in current conditions. • No change in existing resiliency or adaptation to climate change. 	<ul style="list-style-type: none"> • Improved resiliency/ adaptability to climate change impacts such as flooding; nominal impact to GHG emissions. 	<ul style="list-style-type: none"> • Improved resiliency/ adaptability to climate change impacts such as flooding; nominal impact to GHG emissions. 	<ul style="list-style-type: none"> • Improved resiliency/ adaptability to climate change impacts such as flooding; nominal impact to GHG emissions. 	<ul style="list-style-type: none"> • Improved resiliency/ adaptability to climate change impacts such as flooding; nominal impact to GHG emissions.
Environmental Summary	Does not address problems and opportunities	Most Preferred	Moderately Preferred	Moderately Preferred	Most Preferred



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Table 4: Evaluation of Alternative Solutions

Factors and Criteria	Alternative 1 – Do Nothing	Alternative 2 – Upsize Sewers (1.5x)	Alternative 3 – Construct Three New Pump Stations	Alternative 4 – Combined Solution (Upsize Sewers & Three New Pump Stations)	Alternative 5 – Private Drainage Solutions
SOCIAL					
Public Health and Safety <ul style="list-style-type: none"> Potential to improve resiliency of stormwater infrastructure and reduce risks of flooding 	<ul style="list-style-type: none"> Low potential to minimize risks to residents related to flooding as infrastructure would remain in current conditions and the current risk of flooding would remain. 	<ul style="list-style-type: none"> Slightly reduced flooding improves resiliency of stormwater infrastructure. Minimizes risk of flooding to private properties. 	<ul style="list-style-type: none"> Slightly reduced flooding improves resiliency of stormwater infrastructure. Minimizes risk of flooding to private properties. 	<ul style="list-style-type: none"> Reduced flooding improves resiliency of stormwater infrastructure. Minimizes risk of flooding to private properties. 	<ul style="list-style-type: none"> Reduced flooding improves resiliency of stormwater infrastructure. Minimizes risk of flooding to private properties.
Property Acquisition / Impacts <ul style="list-style-type: none"> Requires property acquisition for improvements Permanent/temporary property impacts 	<ul style="list-style-type: none"> No property acquisition/ impacts anticipated as no construction required. 	<ul style="list-style-type: none"> No property acquisition/ impacts anticipated as construction confined to existing rights-of-way. 	<ul style="list-style-type: none"> No property acquisition/ impacts anticipated as construction confined to existing public land areas. 	<ul style="list-style-type: none"> No property acquisition/ impacts anticipated as construction confined to existing public land areas. 	<ul style="list-style-type: none"> No property acquisition/ impacts anticipated as improvements would be completed by property owners, within private property.
Aesthetics <ul style="list-style-type: none"> Requires new above ground infrastructure Potential to impact or improve landscaped areas 	<ul style="list-style-type: none"> Low potential to improve aesthetics through landscaped areas as infrastructure would remain as is. 	<ul style="list-style-type: none"> Low potential to improve aesthetics through landscaped areas. No new above-ground infrastructure required. 	<ul style="list-style-type: none"> Low potential to improve aesthetics through landscaped areas. New above-ground infrastructure is required, but will not be significant, and will be concealed as best as possible. 	<ul style="list-style-type: none"> Low potential to improve aesthetics through landscaped areas. New above-ground infrastructure is required, but will not be significant, and will be concealed as best as possible. 	<ul style="list-style-type: none"> No impact on aesthetics of public property.
Impacts to Existing and Future Land Use <ul style="list-style-type: none"> Support future development within the Town of LaSalle Facilitates access to existing and future business operations and residences 	<ul style="list-style-type: none"> Low potential to support future development as the current risk of flooding would remain. 	<ul style="list-style-type: none"> Supports development within the Town by reducing flooding risk and improving stormwater facilities. 	<ul style="list-style-type: none"> Supports development within the Town by reducing flooding risk and improving stormwater facilities. 	<ul style="list-style-type: none"> Supports development within the Town by reducing flooding risk and improving stormwater facilities. 	<ul style="list-style-type: none"> Supports development within the Town by reducing flooding risk and improving stormwater facilities.
Social Summary	Does not address problems and opportunities	Most Preferred	Moderately Preferred	Most Preferred	Most Preferred

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Table 4: Evaluation of Alternative Solutions

Factors and Criteria	Alternative 1 – Do Nothing	Alternative 2 – Upsize Sewers (1.5x)	Alternative 3 – Construct Three New Pump Stations	Alternative 4 – Combined Solution (Upsize Sewers & Three New Pump Stations)	Alternative 5 – Private Drainage Solutions
CULTURAL					
Archaeological Resources <ul style="list-style-type: none"> Conserves archaeological resources Minimize potential impact to archaeological sites and areas of archaeological potential 	<ul style="list-style-type: none"> No anticipated impacts to archaeological features as construction is not required. 	<ul style="list-style-type: none"> No anticipated impacts to archaeological features as construction is confined to existing road rights-of-way that have been previously disturbed. 	<ul style="list-style-type: none"> Limited anticipated impacts to archaeological features as most construction is confined to areas that have been previously disturbed. 	<ul style="list-style-type: none"> Limited anticipated impacts to archaeological features as most construction is confined to areas that have been previously disturbed. 	<ul style="list-style-type: none"> No anticipated impacts to archaeological features as improvements would occur by property owners, within private property.
Built Cultural Resources & Landscapes <ul style="list-style-type: none"> Conserves built heritage resources and cultural heritage landscapes Minimize potential impact on known (e.g., previously recognized) and potential built heritage resources and cultural heritage landscapes 	<ul style="list-style-type: none"> No anticipated impacts to cultural heritage features as no construction required. 	<ul style="list-style-type: none"> No anticipated impacts to cultural heritage features as most construction is confined to existing rights-of-way. 	<ul style="list-style-type: none"> Limited anticipated impacts to cultural heritage features as extent of most construction would be very limited. 	<ul style="list-style-type: none"> Limited anticipated impacts to cultural heritage features as extent of most construction would be very limited. 	<ul style="list-style-type: none"> No anticipated impacts to cultural heritage features as improvements would occur by property owners, within private property.
Cultural Summary	Does not address problems and opportunities	Most Preferred	Moderately Preferred	Moderately Preferred	Most Preferred



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Table 4: Evaluation of Alternative Solutions

Factors and Criteria	Alternative 1 – Do Nothing	Alternative 2 – Upsize Sewers (1.5x)	Alternative 3 – Construct Three New Pump Stations	Alternative 4 – Combined Solution (Upsize Sewers & Three New Pump Stations)	Alternative 5 – Private Drainage Solutions
TECHNICAL					
Constructability & Utilities <ul style="list-style-type: none"> Constructability considerations including phasing and the impact on existing utilities and services Potential impacts of construction on existing traffic and/or business operations 	<ul style="list-style-type: none"> No impacts as no improvements are proposed. 	<ul style="list-style-type: none"> Significant impacts to existing infrastructure as construction would be completed within existing rights-of-way, and would require reconstruction of roadways. Temporary disruptions during construction. 	<ul style="list-style-type: none"> Limited impact on existing utilities/ services as construction footprint is limited. Temporary disruptions during construction (some construction will take place outside of roads, some within the road footprint). 	<ul style="list-style-type: none"> Significant impacts to existing infrastructure as construction would be completed within existing rights-of-way, and would require reconstruction of roadways. Temporary disruptions during construction (some construction will take place outside of roads some within the road footprint). 	<ul style="list-style-type: none"> No anticipated impacts as improvements would occur by property owners, within private property.
Storm System Performance <ul style="list-style-type: none"> Storm sewer (minor system) capacity Major system capacity Performance under 2020 high water level conditions 	<ul style="list-style-type: none"> Storm sewer capacity unchanged from existing conditions (minor surface flooding occurs during the 5-year storm). Major system capacity unchanged from existing conditions (widespread flooding in a 100-year storm). 	<ul style="list-style-type: none"> Storm sewer capacity improved from existing conditions (slightly reduces surface flooding during the 5-year storm). Major system capacity unchanged from existing conditions (flooding during a 100-year storm slightly reduced compared to existing conditions). 	<ul style="list-style-type: none"> Storm sewer capacity improved from existing conditions (slightly reduces surface flooding during the 5-year storm). Major system capacity unchanged from existing conditions (flooding during a 100-year storm slightly reduced compared to existing conditions). 	<ul style="list-style-type: none"> Storm sewer capacity improved from existing conditions (reduces surface flooding during the 5-year storm). Most significant improvements when compared to other alternatives Major system capacity improved from existing conditions (flooding during a 100-year storm reduced compared to existing conditions). 	<ul style="list-style-type: none"> Storm sewer capacity improved from existing conditions (slightly reduces surface flooding during the 5-year storm). Major system capacity unchanged from existing conditions (flooding during a 100-year storm slightly reduced compared to existing conditions).
Technical Summary	Does not address problems and opportunities	Least Preferred	Moderately Preferred	Moderately Preferred	Most Preferred

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Table 4: Evaluation of Alternative Solutions

Factors and Criteria	Alternative 1 – Do Nothing	Alternative 2 – Upsize Sewers (1.5x)	Alternative 3 – Construct Three New Pump Stations	Alternative 4 – Combined Solution (Upsize Sewers & Three New Pump Stations)	Alternative 5 – Private Drainage Solutions
FINANCIAL					
Life Cycle Cost <ul style="list-style-type: none"> • Estimated capital cost • Estimated operation and maintenance costs 	<ul style="list-style-type: none"> • No capital costs. • Operations costs associated with temporary pumping during flood events. 	<ul style="list-style-type: none"> • High capital cost. • Reduced operations costs because of reduced flooding. • Maintenance costs will be reduced due to new infrastructure. 	<ul style="list-style-type: none"> • Medium capital cost. • Increased operations costs associated with three new pump stations. • Reduced operations costs because of reduced flooding. • Maintenance costs will be reduced due to new infrastructure. . 	<ul style="list-style-type: none"> • High capital cost. • Increased operations costs associated with three new pump stations. • Reduced operations costs because of reduced flooding. • Maintenance costs will be reduced due to new infrastructure. 	<ul style="list-style-type: none"> • No capital cost as improvements would be completed by property owners • Reduced operations costs because of reduced flooding.
Financial Summary	Does not address problems and opportunities	Moderately Preferred	Moderately Preferred	Least Preferred	Most Preferred
OVERALL SUMMARY	Does not address problems and opportunities – Screened out	MODERATELY PREFERRED	MODERATELY PREFERRED	LEAST PREFERRED	MOST PREFERRED



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In addition, the alternatives were assessed under two storm events. The 5-year Chicago 4-hour storm event was selected for the minor system analysis, and the 100-year Chicago 4-hour storm event was selected for the major system analysis.

Boundary conditions for the Detroit River were set to the 25-year water elevation of 175.3 m. This elevation was determined from the maximum monthly mean levels based on annual maximums of the Detroit River from 1918 to 2020. The water levels were received from the nearest station, Wyandotte, MI, of the NOAA Tides & Currents.

A second scenario was completed to assess the system under high water levels. The boundary condition was set to the high-water level experienced in June 2020, Detroit River water level of 175.80 m. For comparison purposes, the ERCA 100-year flood line elevation for the Detroit River at the Marentette Drain outlet is 175.84 m.

In **Appendix C**, figures of Alternatives 1 to 4 are included showing the model results of road ponding during the two design storms under both boundary conditions. Figure 6.1 shows that the existing system generally operates up to a 5-year design storm. Figures for Alternatives 2 to 3 show that the overall reduction in ponding depths under the improvement scenarios is very minimal compared to the Do-Nothing Scenario. Alternative 4 shows improvements under the 100-year storm events, removing nearly all ponding greater than 0.5 m, but ponding remains above 0.3 m up to 0.5 m in many areas. Alternatives 2 to 4 also come with a significant cost, for relatively small performance improvements.

6.3 Preliminary Cost Estimate

A preliminary opinion of probable cost estimate was prepared to assess the capital cost of each of the alternatives. The cost estimate summary can be found in Table 5. **Appendix D** includes the detailed cost estimate breakdown.

Table 5: Preliminary Opinion of Probable Cost

Alternative	Preliminary Opinion of Probable Costs
Alternative No. 1 (Do Nothing)	N/A
Alternative No. 2 (Upsize Sewers)	\$49,610,000
Alternative No. 3 (Pump Stations)	\$13,340,000
Alternative No. 4 (Combined Solution)	\$71,210,000
Alternative No. 5 (Private Drainage Solutions)	Unknown – costs will vary for private property owners based on improvements implemented.



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6.4 Evaluation Summary and Preferred Alternative

As noted in Section 6.2.3, model results of road ponding during the two design storms under both boundary conditions shows that the existing system generally operates up to a 5-year design storm. Modelling shows that the overall reduction in ponding depths under the improvement scenarios is very minimal compared to the Do-Nothing Scenario. Alternative 4 shows improvements under the 100-year storm events, removing nearly all ponding greater than 0.5 m, but ponding remains above 0.3 m up to 0.5 m in many areas. Alternatives 2 to 4 also come with a significant cost, for relatively small performance improvements.

During major storm events, the following items commonly take place on private property:

- Areas surrounding foundation walls become saturated with water.
- Private drainage systems are potentially deficient (i.e., cracked pipes, sump pump failure, tree roots, improper grading around house, etc.).
- In low lying areas, water accumulates (ponds) and enters the stormwater system through manhole covers or cleanouts.

Therefore, Alternative 5 – Private Drainage Solution was determined to be the most preferred solution as a result of the evaluation. The improvements will have no impacts to environmental, social or cultural features as improvements would occur by property owners on private property. The improvements on private property would provide targeted improvements that address flooding issues for residents as needed.

The improvements to reduce the risk of flooding includes maintaining and improving private drainage systems to ensure adequate drainage of surface, roof and groundwater around the home, towards the Town's stormwater system. The following are flood risk mitigation opportunities for property owners to consider.

Maintaining Private Drainage Systems

Maintaining private drainage systems to ensure that surface water and groundwater surrounding the home is directed away from the home and towards the roadway/storm sewer system. This can include an array of options, including but not limited to the following:

- Improving grading around the residence to direct water away from the home.
- Adding drainage pipe to direct water from the downspouts away from the residence.
- Installing a rain barrel to collect water from downspouts.



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- Installing footing and foundation drainage within your yard to remove excess water from the yard surface.
- Landscaping opportunities to improve soil conditions adjacent to residence.

All improvements on private property must ensure that flows are not directed onto a neighbouring property.

Periodic maintenance and repairs to private drainage systems is also important to ensure that surface water and groundwater surrounding the home is directed away from the home and towards the roadway/storm sewer system. Some maintenance/repair items may include:

- Cracked pipes.
- Cracked basement walls.
- Sump pump system.
- Blockages from tree roots.
- Sanitary backflow valve.
- Poor grading around the house, etc.

Downspout Disconnection

During rainfall events, stormwater from private properties will drain directly from private downspouts into the storm sewer system. These downspouts with direct connections to storm sewers can overburden the system, especially during extreme rainfall events, causing flooding. Disconnection of the roof downspouts from the underground sewer system can significantly reduce the direct inflow of water to the private drainage system. However, care must be taken to direct roof water to the street and/or rear yard drainage inlet and not onto a neighbouring property.

Figure 3 displays a private drainage system with a direct connection from the downspout into a municipal storm sewer system.



Stormwater Master Plan and Municipal Class Environmental Assessment Study Detroit River Storm Sewer Outfalls, Stage 2

August 2024

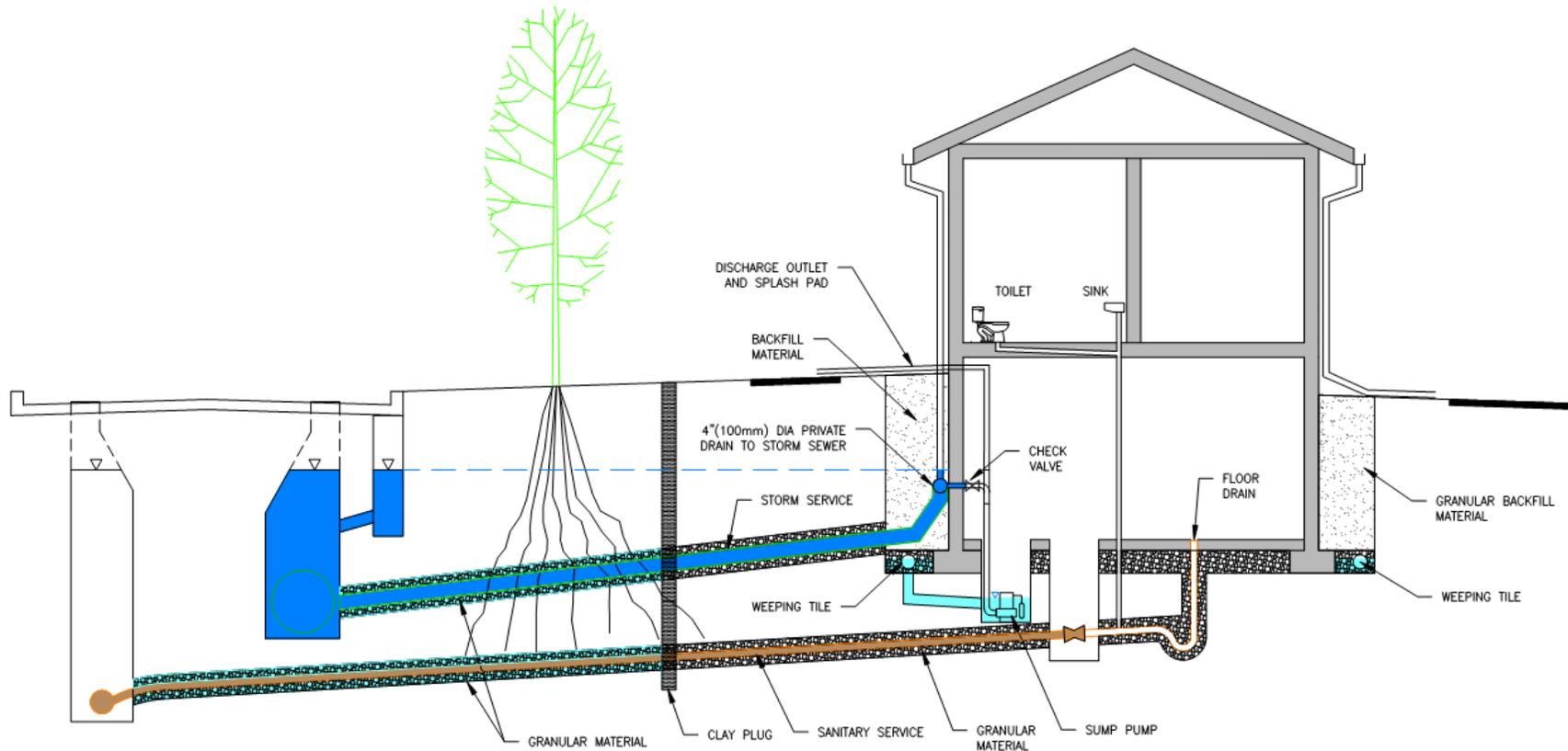


Figure 3: Private Property Drainage Systems (Downspout Connected to Sewer System)



Stormwater Master Plan and Municipal Class Environmental Assessment Study Detroit River Storm Sewer Outfalls, Stage 2

August 2024

Adding Storage Capacity

Adding storage capacity within the system to temporarily detain runoff from high intensity rainfall events and reduce peak flows to the storm sewer. Downspouts that have been disconnected will require proper drainage systems to direct the stormwater to the Town's storm sewers. Following downspout disconnection, directing the stormwater away from the residence, towards a grass area, will add storage capacity. The grass area will aid in absorbing the stormwater, decreasing the quantity of water, and speed of stormwater entering the Town's storm sewers. Examples of additional storage include:

- Temporary rear yard ponding.
- Rain barrels.
- Rain gardens.
- Underground soakaway pits.
- French drains, etc.

Sump Pump System with Backflow Preventor

A sump pump is a device that reduces the risk of water damage to the underground part of a home. When there's excess water in the ground around a basement, a sump pump will move that water up, out and away from the building to the ground surface. The sump pump is a device that detects water to be removed, and many have alarms to alert the homeowner if water rises past a certain point and cannot pump water out as fast as it is flowing in. Homeowners should ensure that the system contains a one-way check valve to prevent expelled water from flowing back into the pit. In addition, the sump pump should be connected to a back-up power source in the case of a power outage. Professional advice should be sought if a homeowner is interested in installing a sump pump in their home.



Stormwater Master Plan and Municipal Class Environmental Assessment Study Detroit River Storm Sewer Outfalls, Stage 2

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7.0 Stormwater Master Plan Implementation

7.1 Project Description

This Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from the effects of stormwater flooding while also protecting the natural environment.

This report focuses on the improvements identified in the Stage 2 catchment. As noted, under normal rainfall events, the existing storm sewer systems operate as designed. Therefore, the preferred alternative is Alternative 5 (Private Drainage Solution), where improvements to drainage systems on private property, by the property owner are recommended. This alternative proposes a combination of measures:

- Maintaining private drainage systems.
- Downspout disconnection.
- Adding storage capacity.
- Ensuring a sump pump system has a backflow preventor (check valve).

7.2 Easements and Property Acquisition

No easements or property acquisition is required as a result of the recommended improvements to improve private property drainage systems.

7.3 Climate Change Resiliency

The MECP's guide, *Consideration of Climate Change in the Environmental Assessment Process*, outlines two approaches for consideration and addressing climate change in project planning including:

- Reducing a project's impact on climate change (climate change mitigation).
- Increasing the project and local ecosystem resilience to climate change (climate change adaptation).

The probability of a climate change event occurring is increasing, and infrastructure needs to be better adapted to build resilience to the impacts of climate change now, and into the future.

There are many climate change related parameters with the potential to impact stormwater infrastructure, such as precipitation, which puts strain on the system.



Stormwater Master Plan and Municipal Class Environmental Assessment Study Detroit River Storm Sewer Outfalls, Stage 2

August 2024

The improvements to private property drainage systems will provide resilience during extreme rainfall events, as these systems reduce the quantity of stormwater entering the Town's storm sewer system, ultimately reducing the risk of flooding and ponding.

7.4 Future Development Areas

During the analysis of the Study Area, there were some existing areas noted for future development, specifically along the Marentette Drain just upstream of Front Road. The undeveloped lands account for approximately 99 hectares in total, which are currently agricultural and forested lands. It is expected that approximately 64 hectares of agricultural land would be developed in the future. These lands are currently comprised of two property owners for the north and south portion of the area. The model analysis for this Master Plan assumed these areas as fully developed, while restricting the flows into the Marentette Drain to existing rates to eliminate raising the hydraulic grade line of the drain.

During the consultation stage, meetings took place with the Town and the developer who owns the north lands. The developer noted that they would like to begin development in the upcoming years. Some conceptual stormwater management plans and municipal drain realignments were provided during the meetings and subsequent email correspondence. The Town noted its mandate is to minimize the number of stormwater management facilities and/or pumping stations for the Town to maintain. The proposed Marentette Drain realignment would be moved to the southern limit of the north lands to allow for the southern development access to continue to discharge flows to the Marentette Drain. Further stormwater management design will be completed when the developer begins the Draft Plan of Subdivision process to work out the details of the SWM facility and drain realignment.



Stormwater Master Plan and Municipal Class Environmental Assessment Study Detroit River Storm Sewer Outfalls, Stage 2

August 2024

8.0 Closing

The improvements recommended in this Stage 2 SWMP will be completed on private property to private drainage systems. As a result, the improvements are exempt from the Class EA process, as noted in Table 6, and no further work is required.

Table 6: MCEA Project Classification

Project Description	MCEA Project Schedule
Private Drainage Solutions (i.e., maintaining private drainage systems, downspout disconnection, adding storage capacity, sump pump system with backflow preventor)	Exempt

The projects identified through the Master Planning process are exempt from further MCEA requirements, and the Town may proceed with the recommendations of this report. The recommendations of this report are not subject to Section 16 Orders.

The filing of this report represents the conclusion of the Municipal Class EA planning process.



APPENDIX A: Consultation



Contact List

Upper Little River

Agency	Title	First Name	Last Name	Department	Title	Address	City	Pr	Postal	Phone	Email		
Provincial Contacts													
Ministry of Natural Resources and Forestry		Crystal	Lafrance	Avimor District	District Manager	615 John Street North	Avimor	ON	N9H 2S8		crystal.lafrance@ontario.ca		
Ministry of Environment, Conservation and Parks		Mark	Badali	Regional EA Coordinator							mark.badali@ontario.ca		
Ministry of Heritage, Tourism, Culture and Sport		Karla	Barbosa	Culture Services Unit	Heritage Planner	401 Bay Street, Suite 1700	Toronto	ON	M7A 0A7		karla.barbosa@ontario.ca		
Ministry of Transportation		Michael	Nadeau	London Office	Manager of Operations (Acting)	659 Eaxter Road, 2nd floor	London	ON	N6E 1L3		michael.nadeau@ontario.ca		
Ministry of Agriculture, Food, and Rural Affairs		Junaid	Ashgar	London Office	Head, Planning and Design (Acting)	659 Eaxter Road, 3rd floor	London	ON	N6E 1L3		junaid.ashgar@ontario.ca		
Ministry of Indigenous Relations and Reconciliation		Leslie	Brewer-Palhazi	Reconciliation, Ministry Partnerships Unit	Advisor	160 Bloor Street E., Suite 400	Toronto	ON	M7A 2E6		leslie.brewer-palhazi@ontario.ca		
Federal Department Contacts													
Department of Fisheries and Oceans Canada		Lisa	Wren		Senior Fisheries Protection Biologist	867 Lakeshore Drive	Burlington	ON	L7S 1A1		lisa.wren@dfo-mpo.gc.ca		
Municipal Departments													
City of Windsor		Christopher	Nepszy		Commissioner, Infrastructure Services	350 City Hall Square West	Windsor	ON	N9A 6S1		cnepszy@cityofwindsor.ca		
City of Windsor		Jelena	Payne		Commissioner, Economic Development & Innovation						jpayne@cityofwindsor.ca		
Town of Amherstburg		Antonieta	Gidu	Engineering and Public Works	Director	512 Sandwich St South	Amherstburg	ON	N9V 3R2	519-736-3664, ext 2320	antonieta.gidu@amherstburg.ca		
Town of Tecumseh		Margaret	Misak-Evans		CAC						mmisak@tecumseh.ca		
Town of Tecumseh		Phil	Bartrik		Director Public Works & Engineering Services						phbartrik@tecumseh.ca		
County of Essex		Jane	Mustac		Director of Infrastructure Services & Engineer	360 Fairview Avenue West	Essex	ON	N8M 1Y6	519-735-2184 ext. 148	janemustac@countyofofessax.ca		
County of Essex		Rebecca	Belanger		Manager, Planning Services						rbelange@countyofofessax.ca		
Town of Lasalle Fire Services		Ed	Thiessen		Fire Chief	1900 Normandy Street	Lasalle	ON	N9H 1P8	T: 519-966-0744	ethiessen@lasalle.ca		
Town of Lasalle Police		Duncan	Daves		Acting Police Chief	1860 Normandy St	Lasalle	ON	N9H 1P8	T: 519-969-5210 EX. 2751	ddaves@lasallepolice.ca		
Town of Lasalle		Dawn	Hudre		Communication Officer	5950 Malden Road	Lasalle	ON	N9H 1S4	T: 519-969-7770 EX. 1263	dahudre@lasalle.ca		
Town of Lasalle		Jeff	Renard		Councillor						jrrenard@lasalle.ca		
Essex Region Conservation Authority		James	Bivart	Watershed Management Services	Director	360 Fairview Avenue West, Suite 311	Essex	ON	N8M 1Y6	T: 519-776-5209 Ext. 350	jbivart@ercca.on		
Essex Region Conservation Authority		Tian	Martin	General ERCA Planning Department		360 Fairview Avenue West	Essex	ON	N8M 1Y6		tmartin@ercca.on		
Utilities													
Hydro One				Hydro One Essex	Planning Department	125 Irwin Avenue	Essex	ON	N8M 2T3		secondanvlenduse@hydroone.com		
Hydro One				Hydro One Essex	Operations Manager	125 Irwin Avenue	Essex	ON	N8M 2T3				
Essex Power Corporation		Anthony	Clavet		Engineering and Assistant Manager	2199 Blackacre Drive, Suite 2	Oakville	ON	N9R 1L0	519-737-9811 ext 150	aclavet@essexpowerlines.ca		
Enwin Utilities		Rob	Sapagnoto	Enwin Utilities Ltd	Customer Service Director	4545 Rhodes Drive, P.O. Box 1625, Stn. A	Windsor	ON	N9W 5T1	519-255-2888 ext 222	rsapagnoto@enwin.com		
Enbridge		Mike	Cincirak	Enbridge	Construction Project Manager	3840 Rhodes Drive, P.O. Box 700	Windsor	ON	N9A 9N7		mcincirak@enbridge.com		
Coopco Cable		Bill	Sorell		Regional Support Specialist	2525 Dougall Avenue	Windsor	ON	N9X 5A7		bill.sorell@coopco.com		
Bell Canada		Jim	Goodchild	Bell Canada	Project Coordinator	1149 Goyeau Street, 1st floor	Windsor	ON	N9A 1H9		james.goodchild@bell.ca		
Indigenous Community Contacts													
Metis Nation of Ontario (MNO)				Head Office		66 Slater Street, Suite 1100	Ottawa	ON	K1P 5H1		communications@metisnation.org		
Chippewas of the Thames	Chief	Jacqueline	French		Chief	309 Chippewa Road RR 1	Muncery	ON	N6L 1Y0	T: 519-289-5241	jeff@cothn.com		
Chippewas of the Thames		Fallon	Burch	Lands and Resources	Consultation Coordinator	320 Chippewa Road RR 1	Muncery	ON	N6L 1Y1		fburch@cothn.com		
Ojibwa Nation of the Thames	Chief	Adrian	Chrisjohn		Chief	1212 Elm Avenue RR #2	Southwold	ON	N6L 2G0	T: 519-318-4585	adrian.chrisjohn@ojibwa.on.ca		
Ojibwa Nation of the Thames		Catherine	Comelius		Political Chief Assistant	2213 Elm Avenue RR #2	Southwold	ON	N6L 2G0	T: 519-652-6161	Catherine.comelius@ojibwa.on.ca		
Ojibwa Nation of the Thames		Brandon	Doxtor		Consultation Coordinator						environment@ojibwa.on.ca		
Munsee-Delaware Nation	Chief	Mark	Peters		Chief, Primary Executive	289 Jubilee Road	Muncery	ON	N6L 1Y0	T: 519-289-5396 Ext. 226 (519)289-5399	chief.peters@munsee.ca		
Munsee-Delaware Nation		Stacy	Phillips		Executive Assistant						canol@munsee.ca		
Delaware Nation	Chief	Diane	Stonfish		Chief	14760 School House Line RR #3	Thamesville	ON	N9P 2K0	T: 519-692-3936 F: 519-692-5522	dstonefish@delawarenation.on.ca		
Bkejwanong Territory (Walpole Island)	Chief	Charles	Sampson		Chief	117 Tahgahoning Road RR #3	Wallaceburg	ON	N9A 4K9	T: (519) 627-1481	charles.sampson@bwh.org		
Bkejwanong Territory (Walpole Island)		Janet	Macbeth		Project Review Coordinator	117 Tahgahoning Road RR #3	Wallaceburg	ON	N9A 4K9	T: 519-627-1475 Ext.108	janet.macbeth@bwh.org		
Bkejwanong Territory (Walpole Island)	Dr.	Dean	Jacobs		Consultation Manager	117 Tahgahoning Road RR #3	Wallaceburg	ON	N9A 4K9	T: 519-627-1475 Ext. 104	dean@bwh.org		
Caikweil First Nation		Michelle	McCormack		Consultation Coordinator	14 Orange Street (P.O. Box 388)	Leamington	ON	N9H 3W3	T: 519-325-1755	ecc2@caikweilfirstnation.ca		
Caikweil First Nation		Jason	Henry		Chief	6247 Indian Lane RR #2	Forest	ON	N6N 1L0	T: 519-795-2125	aspen.henry@caikweilfirstnation.ca		
Chippewas of Kettle and Stony Point First Nation	Chief	Chris	Pian		Chief	978 Tashmoor Avenue	Sarnia	ON	N7T 7H5	T: 519-336-8410 F: 519-336-0382	chief.pian@saamiwasaanq.ca		
Aamjiwaaing First Nation	Chief	Cathleen	O'Brien		Environment Coordinator	978 Tashmoor Avenue	Sarnia	ON	N7T 7H5	T: 519-336-8410 ext. 245 F: 519-336-0382	coobrien@saamiwasaanq.ca		
School Board Contacts													
Greater Essex County District School Board		Shelley	Armstrong		Superintendent of Business and Treasurer	451 Park Street West P.O. Box 210	Windsor	ON	N9A 6K1		shelley.armstrong@essexdsb.ca		
Windsor-Essex Catholic District School Board		Penny	King	Operations Services	Executive Superintendent of Business	1325 California Avenue	Windsor	ON	N9B 2Z5		penny.king@wecdsb.on.ca		
Conseil scolaire catholique Providence		Carolyn	Bastien		Director of Education, Acting Secretary and Treasurer of the Board	7515 Forest Glade Drive	Windsor	ON	N6T 3P5	519-948-9227 ext 240	cbastien@csoprovidence.ca		
Interested Stakeholders													
Canadian National Railway		Jack	Carelio	Engineering Services	Manager of Utilities, SRWA	1290 Central Parkway West, Suite 800	Mississauga	ON	L5C 4R3		jack_carelio@cnr.ca		
Essex Terminal Railway		Tony	Dethomasis			1601 Lincoln Parkway	Windsor	ON	N9Y 2J3	519-978-8222	tdethomasis@etr.ca		
Essex Terminal Railway		Ivan	Pratt								ipratt@etr.ca		
Essex Golf and Country Club		Cotey	Ladouceur			7555 Matchette Road	LaSalle	ON	N9J 2S4	519-734-1251	cladouceur@essexgolf.com		
Student Transportation Services		Chris	Andriewick		Manager of Operations	360 Fairview Avenue West	Essex	ON	N8M 1Y3		chrisa@essexst.com		
Public Stakeholder													
		Richard	Pellerin								rpellerin@scotarra.com		
		Rene	Valente								renevalente@gmail.com		
		Frank	Frappo								frappo@scotarra.com		
		David	Pelrella	President	Petcon					519-796-9391	dpelrella@petcon.net		
		Hossein	Meht			21 Adams Lane					hossein.meht4@gmail.com		
		Sam	Glick			1880 Front Road					sglick@scotarra.com		
		Cathy	Chappus			165 Delaware Ave					cathy.chappus@gmail.com		
		Gerry	Furlon			2885 Dougall Ave					gerryfurlon@scotarra.com		
		Pietro	Valente								pietrovalente@scotarra.com		
		Tim	Shortridge								timshortridge@gmail.com		
		Michael	Burd			30 Adams Lane					mburd@scotarra.com		
		James	Graber			127 Resume Road					grabber212@hotmail.com		
		Al	Bilan			1440 Outram				519-978-2224			
		Jeff	Lamborg			7111 Matchette				519-916-7381			
		George	Granada			7115 Matchette				519-734-7864			
		Sara	Grondin			7775 Lafontaine Lane				519-562-0440			
		Chris	Bianchette			254 Sunnyside Blvd				248-516-3063			
		Charlotte	Bianchette							519-734-0400			
		Alan	Michalid			535 Herdman Street				519-734-0400			
		Sam	Groni			1 Adams Lane				519-921-1272			
		Bl								519-734-6553			
		Victoria	Huano			1295 Lyons Ave				519-328-0986			

Include "project information" excel form

Notice of Commencement



NOTICE OF STUDY COMMENCEMENT (STAGE 2) & NOTICE OF PUBLIC INFORMATION CENTRE LaSalle Detroit River Storm Sewer Outfalls Stormwater Master Plan and Municipal Class Environmental Assessment Study

THE STUDY

The Town of LaSalle has retained Stantec Consulting Ltd. to complete the preparation of a Stormwater Master Plan (SWMP) for the Stage 2 catchment area, including catchments serviced by the Marentette Drain. The main objective of the SWMP is to identify opportunities for potential infrastructure enhancement and improvements to protect public and private property from the effects of stormwater flooding, while preserving the natural environment.

The project will be undertaken in three Stages, with each Stage covering a different stormwater catchment area. A separate SWMP report will be developed for each Stage. The Stage 1 catchment area SWMP was completed in April 2023 and is available on the Town's website: www.lasalle.ca/studies. Future engagement opportunities will be held for the Stage 3 catchment area, including a Public Information Centre (PIC) and SWMP report. The catchment areas are displayed on the study area map.

THE PROCESS

The study is being conducted in accordance with the requirements of Approach 2 of the Master Planning process, as outlined in the *Municipal Class Environmental Assessment (MCEA)* document (2023), under Ontario's *Environmental Assessment Act*. As part of this approach, the SWMP will also address Phases 1 and 2 of the MCEA Process as a Schedule 'B' project.

HOW TO PARTICIPATE IN THE STUDY

One PIC will be held to focus on the improvements to the Stage 2 catchment area. The PIC will include an overview of the study, present the alternative solutions, evaluation criteria, preliminary preferred alternative, and next steps. PIC materials will be available on the Town's website www.lasalle.ca/studies after Tuesday, June 20, 2023. The PIC will also be held in-person on:

Date: Tuesday, June 20, 2023

Time: Drop-in between 4:00 – 7:00 p.m.

Location: Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON)

Please visit the link above or contact a member of the study team for more information, to provide your feedback, or be added to the mailing list by July 20, 2023:

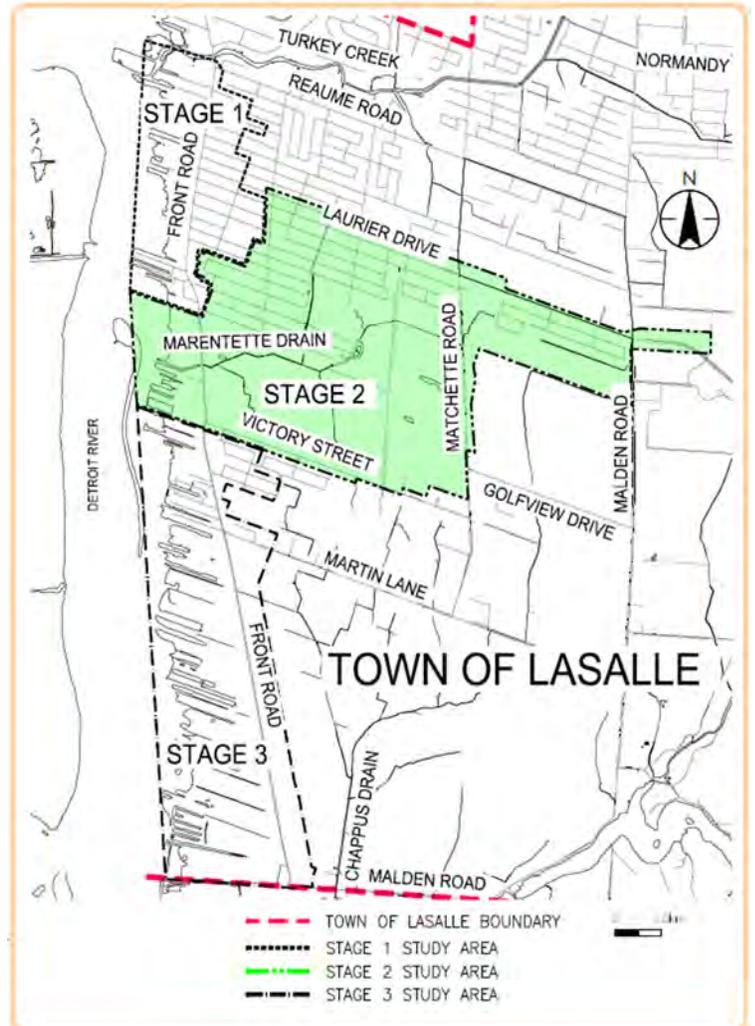
Steve Brown, MBA., P.Eng.
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Email: steve.brown@stantec.com

Jonathan Osborne, P.Eng.
Director of Public Works
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Email: josborne@lasalle.ca

Peter Marra, P.Eng.
Deputy Chief Administrative Officer
Town of LaSalle
Tel: 519-969-7770 ext. 1475
Email: pmarra@lasalle.ca

If you have any accessibility requirements in order to participate in this project, please contact one of the Project Team members listed above. Information collected will be used in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

This notice was first published on May 31, 2023.



French Immersion

will begin in September 2023 at

Sacred Heart

Catholic Elementary School



- Open to students from JK Grade 1
- Improve fluency in French in a friendly neighbourhood Catholic school
- Support for parents in English

Sacred Heart will be a dual-track school, which means all English language learning will continue.



WINDSOR-ESSEX CATHOLIC DISTRICT SCHOOL BOARD

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519-734-1255
for more details

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NOTICE OF STUDY COMMENCEMENT (STAGE 2) & NOTICE OF PUBLIC INFORMATION CENTRE

LaSalle Detroit River Storm Sewer Outfalls Stormwater Master Plan and Municipal Class Environmental Assessment Study



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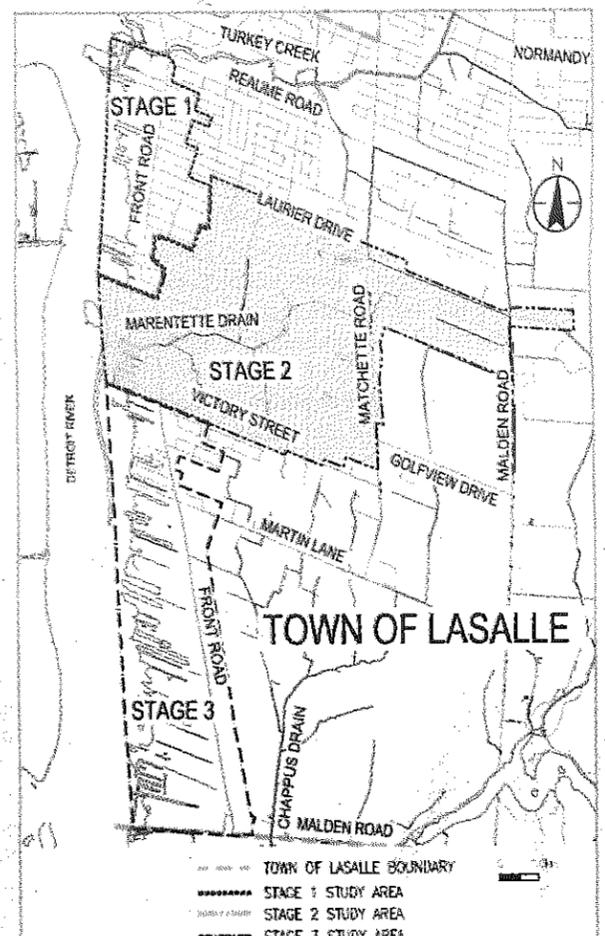
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Please visit the link above or contact a member of the study team for more information, to provide your feedback, or be added to the mailing list by July 20, 2023:

Steve Brown, MBA., P.Eng.
Project Manager
Stantec Consulting Ltd.
Tel: 519-585-7446
Email: steve.brown@stantec.com

Jonathan Osborne, P.Eng.
Director of Public Works
Town of LaSalle
Tel: 519-969-4143 ext. 1255
Email: josborne@lasalle.ca

Peter Marra, P.Eng.
Dy Chief Administrative Officer
Town of LaSalle
Tel: 519-969-7770 ext. 1475
Email: pmarra@lasalle.ca



If you have any accessibility requirements in order to participate in this project, please contact one of the Project Team members listed above. Information collected will be used in accordance with the Freedom of Information and Protection of Privacy Act. With the exception of personal information, all comments will become part of the public record.
This notice was first published on May 31, 2023.

From: [Micks, Sarah](#)
To: ["eanotification.swregion@ontario.ca"](mailto:eanotification.swregion@ontario.ca)
Cc: ["josborne@lasalle.ca"](mailto:josborne@lasalle.ca); ["Peter Marra"](#); [Brown, Steve \(Waterloo\)](#); [Hohner, Paula](#)
Subject: Town of LaSalle, Stage 2 Stormwater Master Plan, MCEA
Date: Tuesday, June 6, 2023 11:00:00 AM
Attachments: [ad_lasalle_fnl_20230605.pdf](#)
[streamlined_ea_project_information_form_LaSalle-Stage2-SWMP.xlsx](#)

Hello,

Please see the attached Notice of Study Commencement for the Town of LaSalle, Stage 2 Stormwater Master Plan (SWMP), as well as the completed Project Information Form.

Please do not hesitate to contact us should you have any questions.

Thank you,

Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

Stantec



The content of this email is the confidential property of Stantec and should not be copied, modified, retransmitted, or used for any purpose except with Stantec's written authorization. If you are not the intended recipient, please delete all copies and notify us immediately.

Please consider the environment before printing this email.

From: [Micks, Sarah](#)
Cc: [Jonathan Osborne](#); [Peter Marra](#); [Brown, Steve \(Waterloo\)](#)
Bcc: [Hohner, Paula](#); [karina.cerniavskaja@ontario.ca](#); [mark.badali1@ontario.ca](#); [karla.barboza@ontario.ca](#); [joseph.harvey@ontario.ca](#); [michael.nadeau@ontario.ca](#); [junaid.asghar@ontario.ca](#); [omafra.eanotices@ontario.ca](#); [leslie.brewer-palhazi@ontario.ca](#); [noticereview@infrastructureontario.ca](#); [lisa.wren@dfp-mpo.gc.ca](#); [cnepszycitywindsor.ca](#); [jpayne@citywindsor.ca](#); [aGiofu@amherstburg.ca](#); [mevans@tecumseh.ca](#); [pbartnik@tecumseh.ca](#); [jmustac@countyofessex.ca](#); [rbelanger@countyofessex.ca](#); [ethiessen@lasalle.ca](#); [DDavies@lasallepolice.ca](#); [dhadre@lasalle.ca](#); [jrenaud@lasalle.ca](#); [JBryant@erca.org](#); [tmartin@erca.org](#); [planning@erca.org](#); [secondarylanduse@hydroone.com](#); [aclavet@essexpowerlines.ca](#); [rspagnuolo@enwin.com](#); [bill.sorrell@cogeco.com](#); [james.goodchild@bell.ca](#); [shelley.armstrong@publicboard.ca](#); [penny_king@wecdsb.on.ca](#); [picajose@cscprovidence.ca](#); [Jack_carello@cpr.ca](#); [Permits.GLD@cn.ca](#); [tdethomasis@etr.ca](#); [ipratt@etr.ca](#); [cladouceur@essexgolf.com](#); [chrisa@essexgolf.com](#); [rpellerin@scoterra.com](#); [remogvalente@gmail.com](#); [ffazio@faziogorgi.com](#); [dpetretta@petcon.net](#); [hossein.mehdi4@gmail.com](#); [cathy.chappus@gmail.com](#); [gforton@cogeco.ca](#); [peter@valentecorp.com](#); [philalalot@gmail.com](#); [mbyrd1@cogeco.ca](#); [graber212@hotmail.com](#)
Subject: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA
Date: Tuesday, June 6, 2023 11:19:00 AM
Attachments: [ad_lasalle_fnl_20230605.pdf](#)

Hello,

Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town's website, www.lasalle.ca/studies starting June 20.

The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation.

Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.

Thank you,

Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

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From: [Harvey, Joseph \(MCM\)](#)
To: [Peter Marra](#)
Cc: [Micks, Sarah](#); [Jonathan Osborne](#); [Brown, Steve \(Waterloo\)](#)
Subject: FW: File 0014583: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA
Date: Thursday, July 20, 2023 9:16:21 AM
Attachments: [ad_lasalle_fnl_20230605.pdf](#)
[2023-07-20_Stage2-LaSalleStormSewer-MCM-Comments.pdf](#)

Peter Marra,

Please find attached our initial advice on the above referenced undertaking.

Please do not hesitate to contact me with any questions or concerns.

Regards,

Joseph Harvey | Heritage Planner

Citizenship, Inclusion and Heritage Division | Heritage Branch | Heritage Planning Unit

Ministry of Citizenship and Multiculturalism

613.242.3743

Joseph.Harvey@ontario.ca

From: Micks, Sarah <Sarah.Micks@stantec.com>
Sent: June-06-23 11:19 AM
Cc: Jonathan Osborne <josborne@lasalle.ca>; Peter Marra <pmarra@lasalle.ca>; Brown, Steve (Waterloo) <steve.brown@stantec.com>
Subject: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA

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Hello,

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The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation.

Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.

Thank you,

Sarah Micks

Environmental Planner

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Direct: 519-432-4292

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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



July 20, 2023

VIA EMAIL ONLY

Peter Marra
Deputy Chief Administrative Officer
Town of LaSalle
pmarra@lasalle.ca

MCM File : **0014583**
Proponent : **Town of LaSalle**
Subject : **Notice of Commencement – Master Plan Approach 2**
Project : **LaSalle Detroit River Storm Sewer Outfalls (Stage 2)**
Location : **Town of LaSalle**

Dear Peter Marra:

Thank you for providing the Ministry of Citizenship and Multiculturalism (MCM) with the Notice of Commencement for this project.

MCM's interest in this master plan relates to its mandate of conserving Ontario's cultural heritage, which includes archaeological resources, built heritage resources and cultural heritage landscapes.

MCM understands that master plans are long range plans which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles. The Municipal Class Environmental Assessment (MCEA) outlines a framework for master plan and associated studies which should recognize the planning and design Process of this Class EA, and should incorporate the key principles of successful environmental assessment planning identified in Section A.1.1. The master planning process will, at minimum, address Phases 1 and 2 of the Planning and Design Process of the MCEA.

This letter provides advice on how to incorporate consideration of cultural heritage in the above-mentioned master planning process by outlining the technical cultural heritage studies and the level of detail required to address cultural heritage in master plans. In accordance with the MCEA, cultural heritage resources should be identified early in the process in order to determine known and potential resources and potential impacts.

Master Plan Summary

The Town of LaSalle has retained Stantec Consulting Ltd. to complete the preparation of a Stormwater Master Plan (SWMP) for the Stage 2 catchment area, including catchments serviced by the Marentette Drain. The main objective of the SWMP is to identify opportunities for potential infrastructure enhancement and improvements to protect public and private property from the effects of stormwater flooding, while preserving the natural environment. The project will be

undertaken in three Stages, with each Stage covering a different stormwater catchment area. A separate SWMP report will be developed for each Stage. The Stage 1 catchment area SWMP was completed in April 2023 and is available on the Town's website: www.lasalle.ca/studies. Future engagement opportunities will be held for the Stage 3 catchment area, including a Public Information Centre (PIC) and SWMP report.

The study is being conducted in accordance with the requirements of Approach 2 of the Master Planning process, as outlined in the Municipal Class Environmental Assessment (MCEA) document (2023), under Ontario's *Environmental Assessment Act*. As part of this approach, the SWMP will also address Phases 1 and 2 of the MCEA Process as a Schedule 'B' project.

Identifying Cultural Heritage Resources

MCM understands that the level of investigation, consultation and documentation in this master plan is sufficient to fulfill the requirements for Schedule B MCEA undertakings and would provide the basis for future investigations for the specific Schedule C MCEA undertakings identified within it. In regards to cultural heritage resources the Master Plan Document should;

- identify existing baseline environmental conditions,
- identify expected environmental impacts and,
- Include measures to mitigate potential negative impacts.

Archaeological Resources

Schedule B MCEA undertakings included as part of the master plan should be screened using the Ministry's [Criteria for Evaluating Archaeological Potential](#) and [Criteria for Evaluating Marine Archaeological Potential](#) to determine if an archaeological assessment is needed. If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licensed under the Ontario Heritage Act and submitted for MCM review prior to the completion of the master plan.

Built Heritage Resources and Cultural Heritage Landscapes

A Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment will be undertaken for the entire study area during the planning phase and will be summarized in the EA Report. This study will:

1. Describe the existing baseline cultural heritage conditions within the study area by identifying all known or potential built heritage resources and cultural heritage landscapes, including a historical summary of the study area. The Ministry 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.

For Schedule B MCEAs undertaken as part of the master plan, where a known or potential built heritage resource or cultural heritage landscape may be directly and adversely impacted, and where it has not yet been evaluated for Cultural Heritage Value or Interest (CHVI), completion of a Cultural Heritage Evaluation Report (CHER) is required to fully understand its CHVI and level

of significance. The CHER must be completed as part of the final EA report. If a potential resource is found to be of CHVI, then a Heritage Impact Assessment (HIA) will need to be undertaken and included in the final EA report. Our Ministry's [Info Sheet #5: Heritage Impact Assessments and Conservation Plans](#) outlines the scope of HIAs. Please send the HIA to MCM for review and make it available to local organizations or individuals who have expressed interest in review.

While some cultural heritage landscapes are contained within individual property boundaries, others span across multiple properties. For certain cultural heritage landscapes, it will be more appropriate for the CHER and HIA to include multiple properties, in order to reflect the extent of that cultural heritage landscape in its entirety.

Community input should be sought to identify locally recognized and potential cultural heritage resources. Sources include, but are not limited to, municipal heritage committees, community heritage registers, 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

Technical cultural heritage studies are to 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. Please advise MCM whether any technical heritage studies will be completed for this master plan and provide them to MCM before issuing a Notice of Completion.

Thank you for consulting MCM on this project. Please continue to do so through the master plan process and contact myself with any questions or concerns.

Joseph Harvey
Heritage Planner
Heritage Planning Unit
joseph.harvey@Ontario.ca

Copied to: Steve Brown, Project Manager, Stantec Consulting Ltd.
Sarah Micks, Environmental Planner, Stantec Consulting Ltd.
Jonathan Osborne, Director of Public Works, Town of LaSalle

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*.

From: [Brown, Steve \(Waterloo\)](#)
To: [SECONDARY LAND USE Department](#)
Cc: [Jonathan Osborne](#); [Peter Marra](#); [Michael Cappucci](#); [Micks, Sarah](#); [Hohner, Paula](#)
Subject: RE: Hydro One Response: 20230628-NoticeOfPIC1-LaSalle Detroit River Storm Sewer Outfalls Stormwater Master Plan(Stage 2)
Date: Friday, June 30, 2023 11:35:54 AM
Attachments: [20230628-NoticeOfPIC1-LaSalle Detroit River Storm Sewer Outfalls Stormwater Master Plan Stage 2.pdf](#)

Thank you for your correspondence – it has been saved in the project file. We will continue to consult Hydro One through secondarylanduse@hydroone.com on this project.

Steve.

Steve Brown MBA, P.Eng.
Surface Water Lead, Canada East

Direct: 519 585-7446
Mobile: 519 577-2551
steve.brown@stantec.com

Stantec
100-300 Hagey Boulevard
Waterloo ON N2L 0A4



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-----Original Message-----

From: SUN Hongxia <Susan.SUN@HydroOne.com> On Behalf Of SECONDARY LAND USE Department
Sent: Wednesday, June 28, 2023 10:42 AM
To: Brown, Steve (Waterloo) <steve.brown@stantec.com>
Cc: SECONDARY LAND USE Department <Department.SecondaryLandUse@hydroone.com>
Subject: Hydro One Response: 20230628-NoticeOfPIC1-LaSalle Detroit River Storm Sewer Outfalls Stormwater Master Plan(Stage 2)

Please see the attached for Hydro One's Response.

Hydro One Networks Inc

SecondaryLandUse@HydroOne.com

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Hydro One Networks Inc.

483 Bay Street
8th Floor South Tower
Toronto, Ontario M5G 2P5

HydroOne.com

June 28, 2023

Re: LaSalle Detroit River Storm Sewer Outfalls Stormwater Master Plan and Class EA (Stage 2)

Attention:
Mr. Steve Brown, MBA, P.Eng
Project Manager
Stantec Consulting Ltd.

Thank you for sending us notification regarding (LaSalle Detroit River Storm Sewer Outfalls Stormwater Master Plan and Class EA). In our preliminary assessment, we have confirmed that Hydro One has existing distribution assets within your study area.

At this time, we do not have sufficient information to comment on the potential resulting impacts that your project may have on our infrastructure. As such, we must stay informed as more information becomes available so that we can advise if any of the alternative solutions present actual conflicts with our assets, and if so; what resulting measures and costs could be incurred by the proponent. Note that this response does not constitute approval for your plans and is being sent to you as a courtesy to inform you that we must continue to be consulted on your project.

Hydro One must be consulted during all stages of your project. Please ensure that all future communications about this and future project(s) are sent to us electronically to secondarylanduse@hydroone.com

Sent on behalf of,

**Secondary Land Use
Asset Optimization
Strategy & Integrated Planning
Hydro One Networks Inc.**

Public Information Centre 1



NOTICE OF STUDY COMMENCEMENT (STAGE 2) & NOTICE OF PUBLIC INFORMATION CENTRE LaSalle Detroit River Storm Sewer Outfalls Stormwater Master Plan and Municipal Class Environmental Assessment Study

THE STUDY

The Town of LaSalle has retained Stantec Consulting Ltd. to complete the preparation of a Stormwater Master Plan (SWMP) for the Stage 2 catchment area, including catchments serviced by the Marentette Drain. The main objective of the SWMP is to identify opportunities for potential infrastructure enhancement and improvements to protect public and private property from the effects of stormwater flooding, while preserving the natural environment.

The project will be undertaken in three Stages, with each Stage covering a different stormwater catchment area. A separate SWMP report will be developed for each Stage. The Stage 1 catchment area SWMP was completed in April 2023 and is available on the Town's website: www.lasalle.ca/studies. Future engagement opportunities will be held for the Stage 3 catchment area, including a Public Information Centre (PIC) and SWMP report. The catchment areas are displayed on the study area map.

THE PROCESS

The study is being conducted in accordance with the requirements of Approach 2 of the Master Planning process, as outlined in the *Municipal Class Environmental Assessment (MCEA)* document (2023), under Ontario's *Environmental Assessment Act*. As part of this approach, the SWMP will also address Phases 1 and 2 of the MCEA Process as a Schedule 'B' project.

HOW TO PARTICIPATE IN THE STUDY

One PIC will be held to focus on the improvements to the Stage 2 catchment area. The PIC will include an overview of the study, present the alternative solutions, evaluation criteria, preliminary preferred alternative, and next steps. PIC materials will be available on the Town's website www.lasalle.ca/studies after Tuesday, June 20, 2023. The PIC will also be held in-person on:

Date: Tuesday, June 20, 2023

Time: Drop-in between 4:00 – 7:00 p.m.

Location: Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON)

Please visit the link above or contact a member of the study team for more information, to provide your feedback, or be added to the mailing list by July 20, 2023:

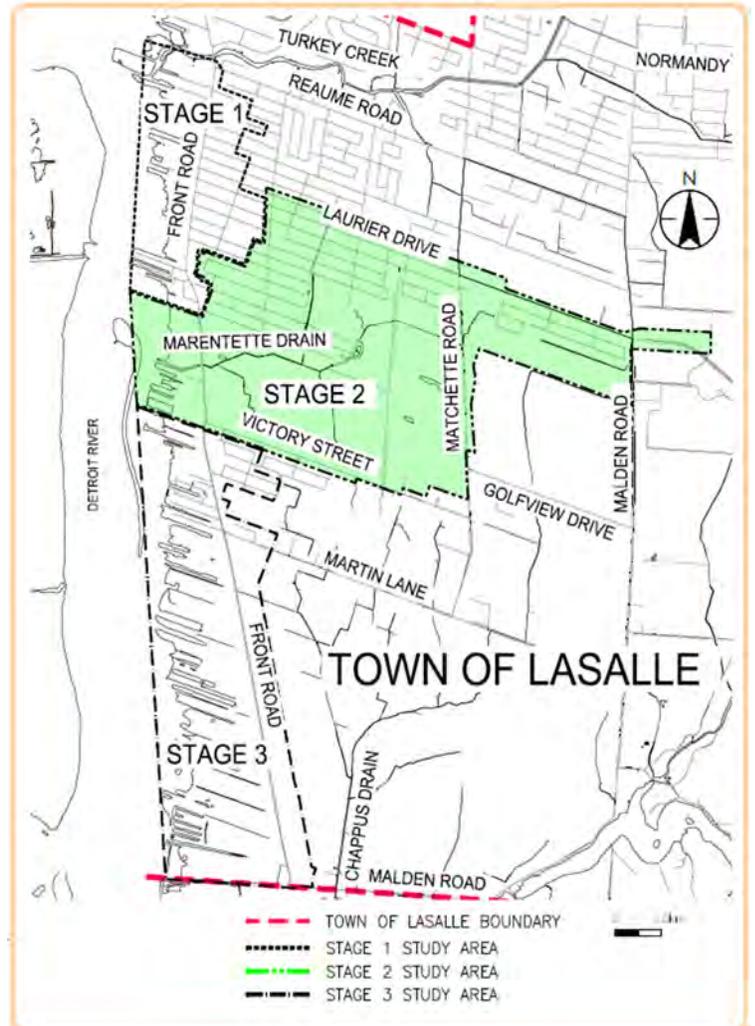
Steve Brown, MBA., P.Eng.
Project Manager
Stantec Consulting Ltd.
Tel: 519-585-7446
Email: steve.brown@stantec.com

Jonathan Osborne, P.Eng.
Director of Public Works
Town of LaSalle
Tel: 519-969-4143 ext. 1255
Email: josborne@lasalle.ca

Peter Marra, P.Eng.
Deputy Chief Administrative Officer
Town of LaSalle
Tel: 519-969-7770 ext. 1475
Email: pmarra@lasalle.ca

If you have any accessibility requirements in order to participate in this project, please contact one of the Project Team members listed above. Information collected will be used in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

This notice was first published on May 31, 2023.





Detroit River Storm Sewer Outfalls Stormwater Master Plan & Class Environmental Assessment Study

STAGE 2 - PUBLIC INFORMATION CENTRE 1

JUNE 20, 2023

4:00PM-7:00PM

5950 MALDEN ROAD, TOWN OF LASALLE

Purpose of this Public Information Centre

Purpose of the Project and Stage 2 Study Area

Review the Study Methodology and Municipal Class Environmental Assessment Process

Present the Alternative Solutions for the Stage 2 Catchment Area

Present Evaluation of Alternative Solutions

Highlight Next Steps and Project Milestones

Provide an Opportunity for Feedback from the Public and Relevant Agencies

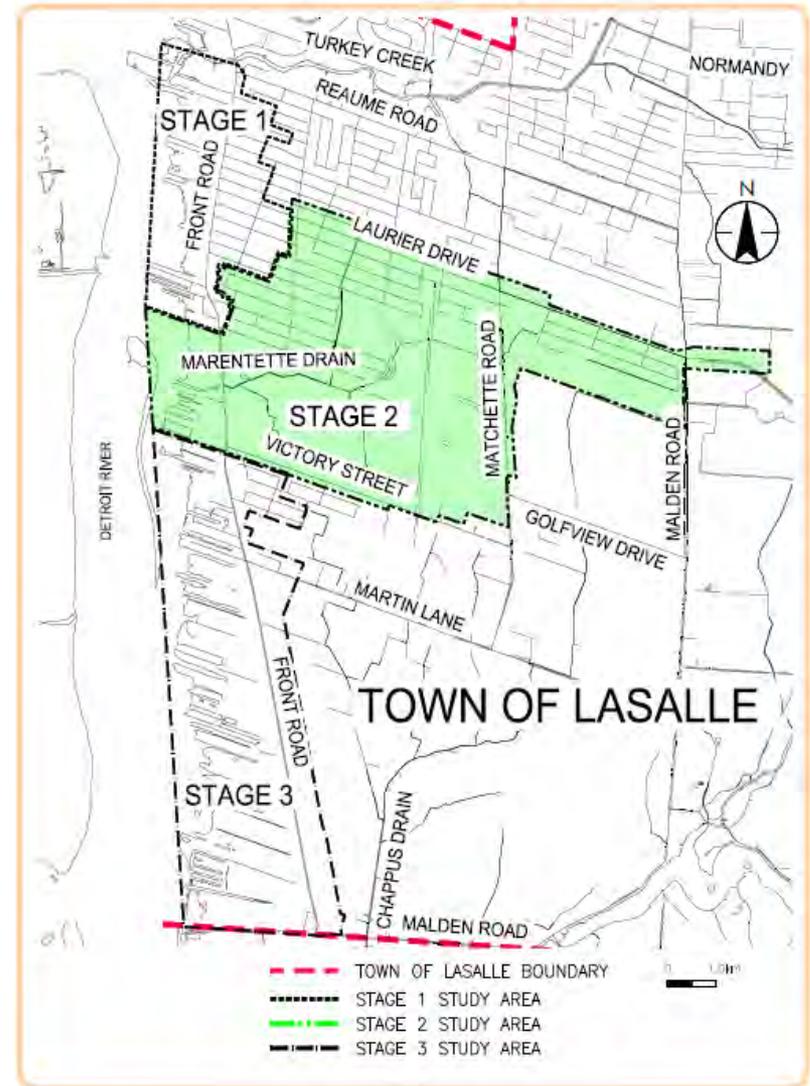
Purpose of the Stormwater Master Plan

A Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from the effects of stormwater flooding while also protecting the natural environment.

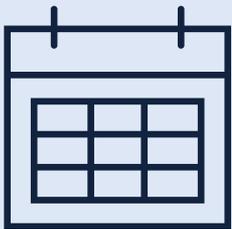
The SWMP will review portions of the stormwater drainage system that has a direct connection to the Detroit River or an indirect connection via the Marentette Drain and its tributary drains.

The SWMP is being completed in three stages. Improvements will be identified for each Stage, with the preferred solutions presented at Public Information Centres. The Stage 1 catchment area has been completed, and additional information is available on the Town's website.

This presentation focuses on the improvements identified in Stage 2.



Municipal Class EA Process



Notice of Study Commencement (June 2023)

Public Information Centre (PIC) 1 (June 20 – July 20, 2023)

Notice of Completion – A separate notice will be issued as each Stage is complete



These steps will be repeated for the Stage 3 catchment area SWMP

SWMP – The Steps Involved

The following tasks will be completed for each Stage of the SWMP:

● Collection and review of background information. Field Inspections to collect missing storm sewer data required for analysis.

● Complete a Natural Heritage Study for all three project areas.

● Background PIC (July 2021) – Project introduction for all three stages

● Build and calibrate a hydrologic and hydraulic computer model of the storm sewer system. Use this model to complete the stormwater assessment to identify system deficiencies.

● Prioritize identified problem areas and develop alternative solutions for addressing stormwater deficiencies.

● PIC to present preliminary alternative solutions

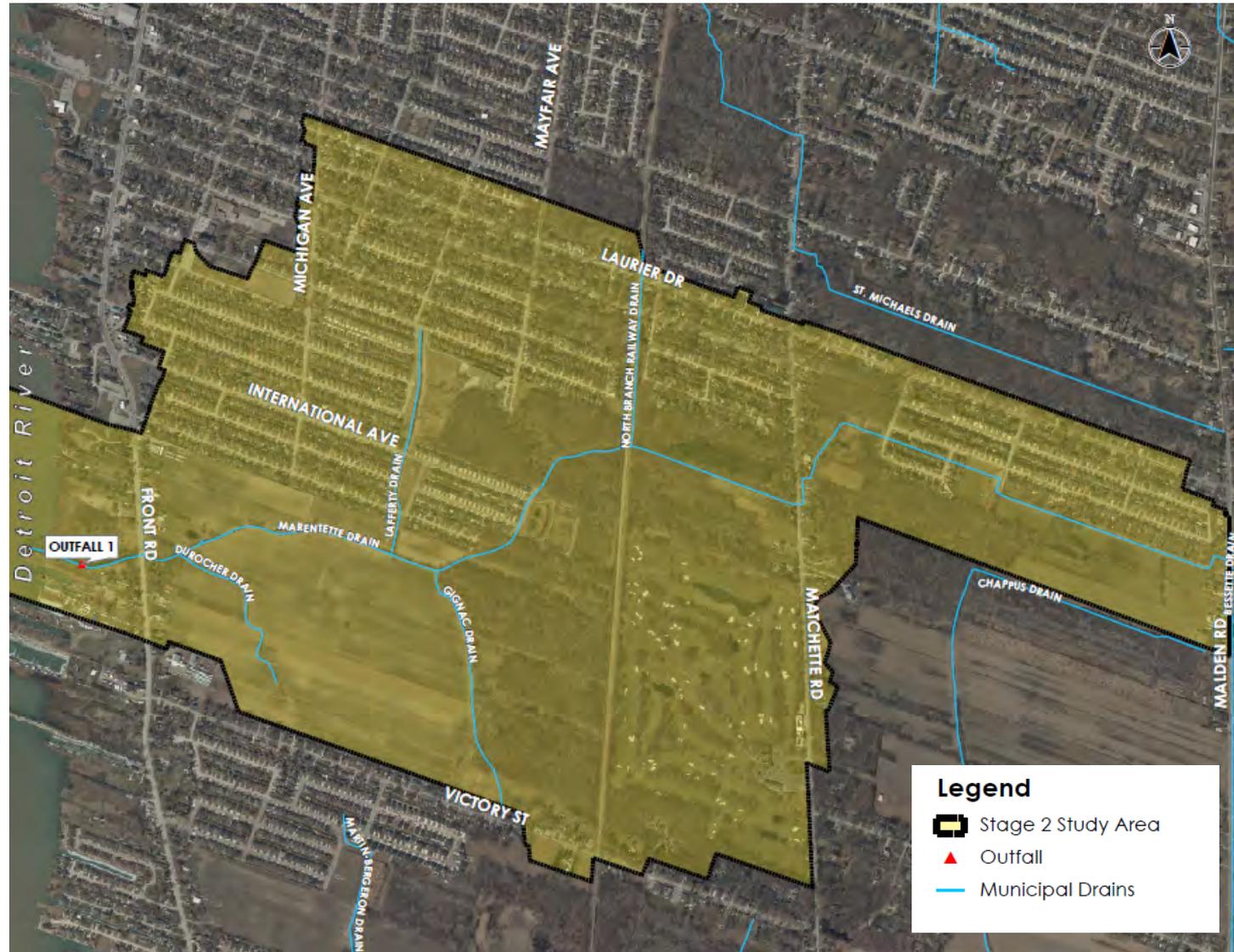
● Finalize alternative solutions based on feedback from PIC. Summarize findings, recommendations and cost estimates in a Stormwater Master Plan Study Report.

We are here

Project Study Area- Stage 2

The Stage 2 study area includes catchments that are serviced by the Marentette Drain. This area extends from the Detroit River to the Malden Road area.

One outfall is present:
- Marentette Drain



Alternative Solutions

The following alternative solutions have been carried forward for evaluation:

Alternative 1 – Do Nothing

This alternative maintains the future conditions in the Stage 2 area and is used for comparison purposes. No improvements to the storm system were made.

Alternative 2 – Upsize Sewers

This alternative proposes that the size of all existing storm sewers within the Stage 2 area be increased by 1.5 times their existing size.

Alternative 3 – Pump Stations

This alternative proposes the installation of storm pumping stations at 3 key locations sized to pass the 5-year storm flows.

Alternative 4 – Combined Solution

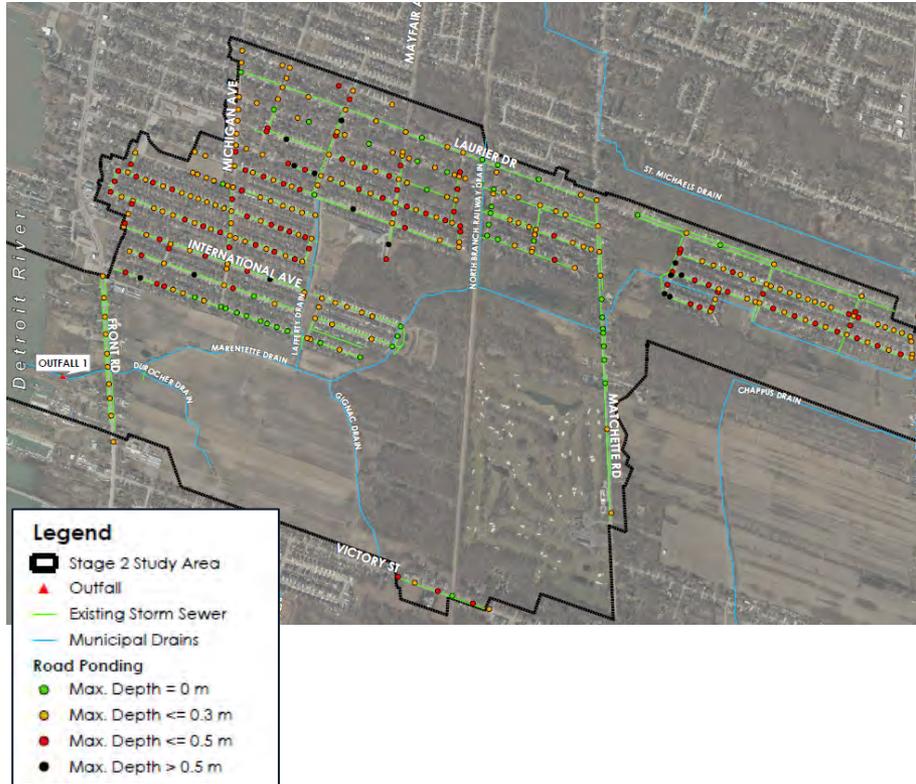
This alternative proposes a combination of measures: increasing storm sewer sizes in the Stage 2 catchment area, installation of 100-year flow storm pumping stations, and replacing some culverts in the Marentette Drain that cause flow restrictions.

Alternative 5 - Private Drainage Solutions

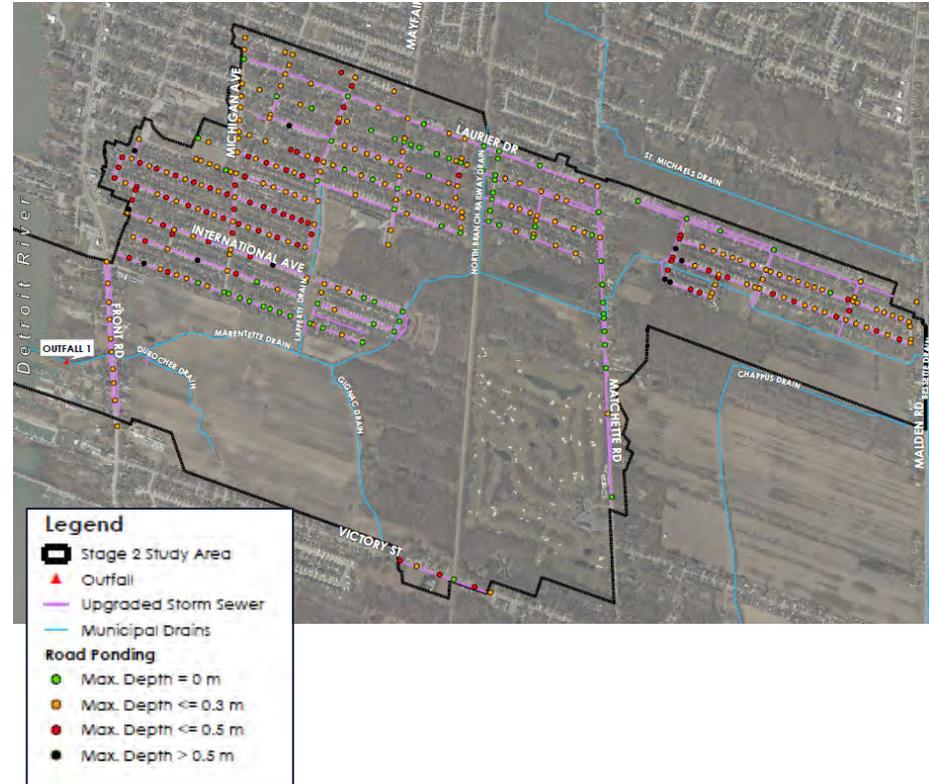
This alternative proposes property owners pursue private drainage improvements (i.e., maintain private drainage systems, improve conveyance, etc.)

Alternative Solutions 1 & 2

Alternative 1 – Do Nothing



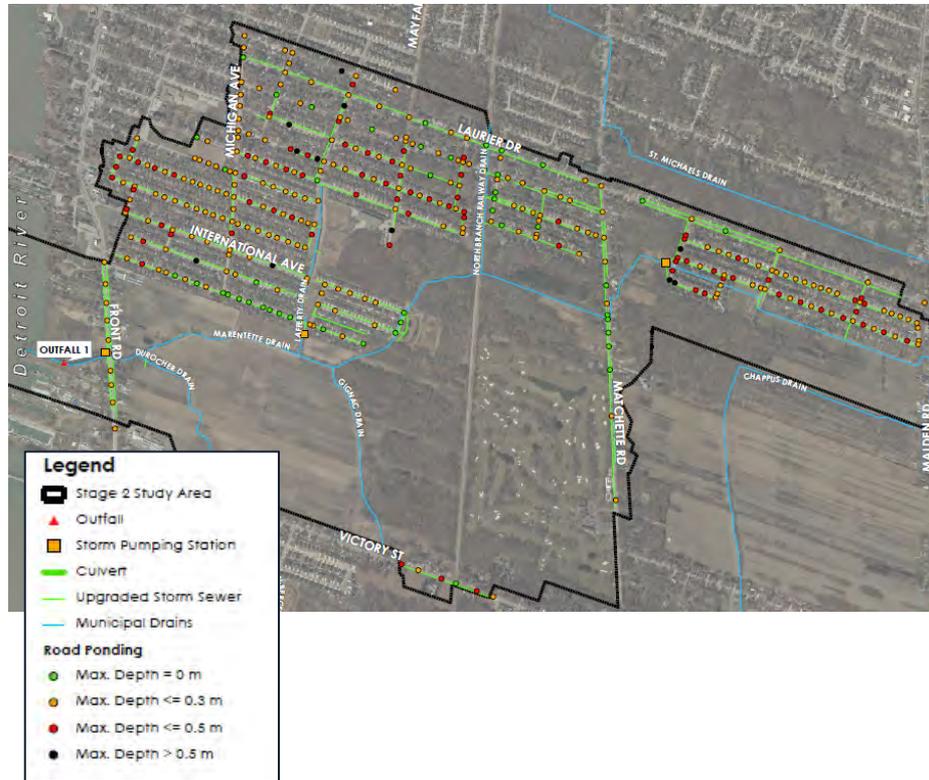
Alternative 2 – Upsize Sewers



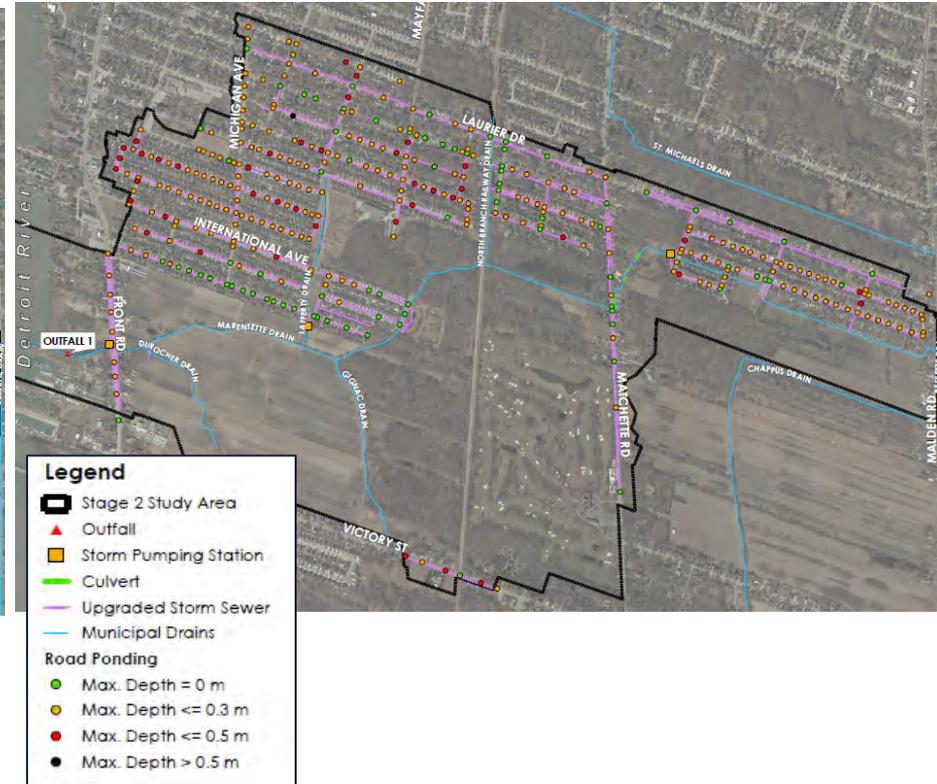
Images illustrate ponding conditions during the 100-year storm event

Alternative Solutions 3 & 4

Alternative 3 – Pump Stations



Alternative 4 – Combined Solution



Images illustrate ponding conditions during the 100-year storm event

Evaluation Criteria

The SWMP Alternative Solutions are evaluated against the following criteria:

Natural Environment

- Terrestrial & Aquatic Habitat
- Wildlife
- Climate Change



Economic/Financial

- Lifecycle Cost

Social

- Public Health and Safety
- Property Acquisition / Impacts
- Aesthetics
- Impacts to Existing and Future Land Use



Technical

- Constructability & Utilities
- Storm System Performance

Cultural

- Archaeology
- Built Cultural Resources and Heritage Landscapes

Evaluation of Alternative Solutions

	Alternative 2 Upsize Sewers	Alternative 3 Pump Stations	Alternative 4 Combined Solution	Alternative 5 Private Drainage Solutions
Environmental	Most Preferred	Moderately Preferred	Moderately Preferred	Most Preferred
Social	Most Preferred	Moderately Preferred	Most Preferred	Most Preferred
Cultural	Most Preferred	Moderately Preferred	Moderately Preferred	Most Preferred
Technical	Least Preferred	Moderately Preferred	Moderately Preferred	Most Preferred
Financial	Moderately Preferred	Moderately Preferred	Least Preferred	Most Preferred
Evaluation Summary	Moderately Preferred	Moderately Preferred	Least Preferred	Most Preferred

Alternative 5 was determined to be the preliminary preferred solution because:

- Limited to no impacts to environmental, social and cultural features as improvements would occur by property owners on private property
- Alternatives 2, and 3 do not significantly decrease the flooding risk within the Stage 2 catchment area
- Alternative 4 is the most expensive; it will decrease the flooding risk, but at a significant cost.
- Provides targeted improvements that address flooding issues as needed

Private Drainage Solutions

Under normal rainfall events, the storm sewer systems operate as designed. However, during extreme storms, the following takes place:

- Areas surrounding foundation walls become saturated with water.
- Private drainage systems are potentially deficient (i.e. – cracked pipes, sump pump failure, tree roots, grading around the house, etc.)
- In low lying areas, water accumulates (ponds) and enters the stormwater system through manhole covers or cleanouts.

The most effective way to reduce the risk of private property flooding involves:

- Maintain/Improve private drainage systems to ensure adequate drainage of surface, roof and groundwater around the home, towards the Town's stormwater system. The following are flood risk mitigation opportunities for property owners to consider:
 - Maintaining private drainage systems
 - Adding storage capacity
 - Private drainage system maintenance
 - Sump pump system with backflow preventor (check valve)
 - Downspout Disconnection

Improvement Opportunities

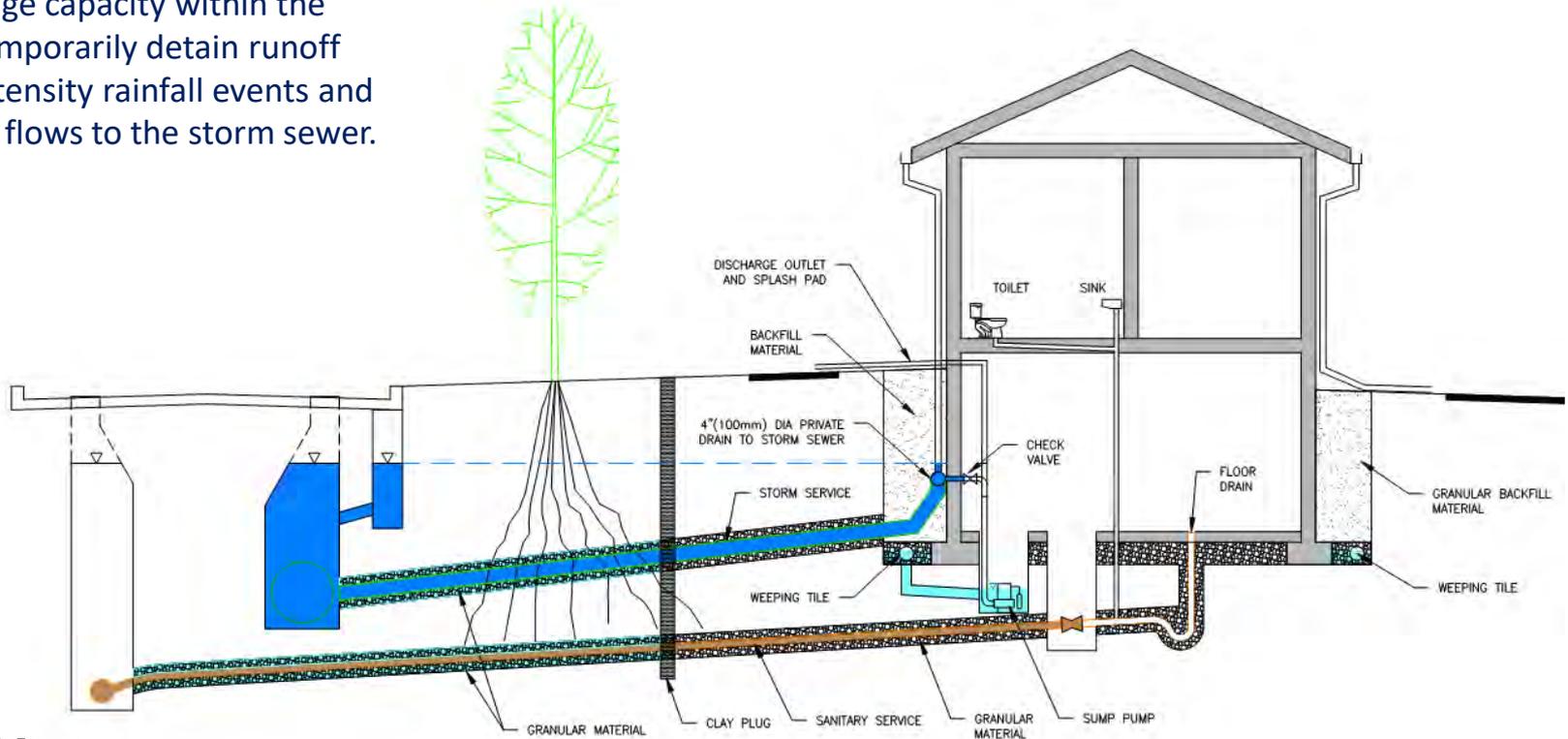
Private Property Flooding Mitigation

Maintaining Private Drainage Systems

Maintaining private drainage systems to ensure that surface water and groundwater surrounding the home is directed away from the home and towards the roadway/storm sewer system.

Adding Storage Capacity

Adding storage capacity within the system to temporarily detain runoff from high intensity rainfall events and reduce peak flows to the storm sewer.



Improvement Opportunities

Maintaining & Improving Private Drainage Systems

Private Drainage System Regular Maintenance

Periodic maintenance and repairs to private drainage systems is important to ensure that surface water and groundwater surrounding the home is directed away from the home and towards the roadway/storm sewer system. Some maintenance/repair items include;

- cracked pipes, cracked basement walls, sump pump system, blockages from tree roots, sanitary backflow valve, poor grading around the house, etc.

Sump Pump System

In the event of a power outage, a backup sump pump system is strongly recommended. It is also recommended to have a sump pump discharging to the ground surface.

Downspout Disconnection

When feasible, disconnection of the roof downspouts from the underground sewer system can significantly reduce the direct inflow of water to the private drainage system. However, care must be taken to direct roof water to the street and/or rear yard drainage inlet and not on a neighbouring property.



Next Steps

- ❖ Review input received from this PIC
- ❖ Prepare Stage 2 Summary Report for 30-day public review
- ❖ Notice of Study Completion for Stage 2
- ❖ Continue with the Stormwater assessment and alternative solutions development for Stage 3

Stage 2 Milestones

- ❖ Stage 2 Draft SWMP Report – fall/winter 2023

Thank you for attending!

If you have any questions, concerns or comments, please provide them to a member of the project team:

Peter Marra, P.Eng.

Deputy Chief Administrative Officer

Town of LaSalle

Phone: 519-969-7770 ext. 1475

Email: pmarra@lasalle.ca



Jonathan Osborne, P.Eng.

Director of Public Works

Town of LaSalle

Direct: 519-969-7770 ext. 1255

Email: josborne@lasalle.ca



Steve Brown, MBA, P.Eng.

Project Manager

Stantec Consulting Ltd.

Direct: 519-585-7446

Email: steve.brown@stantec.com



SLIDE 1 (Introduction)

Welcome to the Public Information Centre (PIC) for the Detroit River Storm Sewer Outfalls, Stage 2 Stormwater Master Plan and Class Environmental Assessment Study.

This Study will assess the stormwater infrastructure draining directly or indirectly into the Detroit River.

Thank you for taking the time to watch this presentation and learn more about this study! Your input is valuable to us. This presentation will be available on the Town's website until Friday, July 20, 2023.

SLIDE 2 (Purpose of this PIC)

The purpose of this PIC is to:

- Present the purpose of the Project and Stage 2 Study Area
- Review the Study Methodology and Municipal Class Environmental Assessment Requirements
- Present the Alternative Solutions for the Stage 2 Catchment Area
- Present Evaluation of Alternative Solutions
- Highlight Next Steps and Project Milestones
- Provide an Opportunity for Feedback from the Public and Review Agencies

We encourage your participation and comments throughout the study.

SLIDE 3 (Purpose of SWMP)

A Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from the effects of stormwater flooding while also protecting the natural environment.

The SWMP will review portions of the stormwater drainage system that have a direct connection to the Detroit River or an indirect connection via the Marentette Drain and its tributary drains.

The SWMP is being completed in three stages. Improvements will be identified for each Stage, with the preferred solutions presented at Public Information Centres. The Stage 1 catchment area has been completed, and additional information is available on the Town's website.

This presentation focuses on the improvements identified in Stage 2.

SLIDE 4 (Municipal Class EA Process)

The Municipal Class Environmental Assessment (or MCEA) is an approved process under the Ontario Environmental Assessment (or EA) Act, and includes five planning and design phases.

This study is being undertaken in accordance with Approach #2 of the Master Planning Process. Phases 1 and 2 of the MCEA process will generally be addressed through this study, and includes:

- Phase 1
 - Information gathering
 - Identifying problems and opportunities
- Phase 2
 - Identifying and evaluating alternative solutions
 - Developing an implementation strategy

Consultation for the Stage 2 SWMP includes this PIC, and a Master Plan report, which will be issued at the completion of this study. This consultation will be repeated for the future Stage 3 catchment area SWMP study.

SLIDE 5 (Steps Involved)

The following tasks will be completed for each Stage of the SWMP:

- Collect and review background information. Field inspections to collect missing storm sewer data required for analysis.
- Complete natural heritage studies for all three project areas.
- Background PIC (July 2021) – Project introduction for all three stages.
- Build and calibrate a hydrologic and hydraulic computer model of the storm sewer system. Use this model to complete the stormwater assessment to identify system deficiencies.
- Prioritize identified problem areas and develop alternative solutions for addressing stormwater deficiencies.
- Hold PIC to present preliminary alternative solutions for the respective Stage (this is the step we are currently at).
- Finalize alternative solutions based on feedback from each PIC. Summarize findings, recommendations, and cost estimates in a Stormwater Master Plan Study Report. Separate SWMP reports will be provided for Stage 1, 2 and 3.

SLIDE 6 (Stage 2)

The Stage 2 study area includes catchments that are serviced by the Marentette Drain. This area extends from the Detroit River to the Malden Road area.

One outfall is present:

- Marentette Drain

SLIDE 7 (Alternative Solutions)

The following alternative solutions to reduce the frequency and extent of surface flooding have been carried forward for evaluation. All 5 alternatives include the full-buildout conditions, which shows future residential areas as fully developed.

- **Alternative 1 – Do Nothing** - This alternative maintains the future conditions in the Stage 2 area and is used for comparison purposes. No improvements to the storm system were made.
- **Alternative 2 – Upsize Sewers** - This alternative proposes that the size of all existing storm sewers within the Stage 2 area be increased by 1.5 times their existing size.
- **Alternative 3 – Pump Stations** - This alternative proposes the installation of storm pumping stations at 3 key locations sized to pass the 5-year storm flows.
- **Alternative 4 – Combined Solution** - This alternative proposes a combination of measures: increasing storm sewer sizes in the Stage 2 catchment area, installation of 100-year flow storm pumping stations, and replacing some culverts in the Marentette Drain that cause flow restrictions.
- **Alternative 5 – Private Drainage Solutions** - This alternative proposes property owners pursue private drainage improvements (i.e., maintain private drainage systems, improve conveyance, etc.)

SLIDE 8 (Alternative Solutions 1 & 2)

The images display Alternative 1 (Do Nothing) and Alternative 2 (Upsize Sewers), road ponding during a 100-year storm event.

A 100-year storm event models a ‘worst case scenario’ rainfall event with a very significant amount of precipitation. This is used to understand how the stormwater system would handle the stormwater. The road ponding displays where the stormwater is unable to successfully drain through the system. This is modelled for Alternative Solutions 1-4.

SLIDE 9 (Alternative Solutions 3 & 4)

The images display Alternative 3 (Pump Stations) and Alternative 4 (Combined Solution), road ponding during a 100-year storm event.

SLIDE 10 (Evaluation Criteria)

Each Alternative Solution was evaluated using the following factors:

- Natural environment, which considers terrestrial & aquatic habitat, wildlife and climate change.
- Social considerations, which considers public health and safety, property acquisition and impacts, aesthetics, and impacts to existing and future land use.
- Cultural considerations, which includes archaeological resources and built cultural resources and heritage landscapes.
- Economic and Financial considerations, which considers lifecycle costs (capital costs and operation and maintenance costs).
- Technical considerations, which considers constructability & utilities, and storm system performance.

Comments received from agencies, stakeholders and members of the public are also considered.

SLIDE 11 (Evaluation of Alternative Solutions)

The alternatives were assessed against the evaluation criteria to determine the most preferred solution. As presented, Alternative 5, Private Drainage Solutions, was determined to be the preferred solution because:

- Limited to no impacts to environmental, social and cultural features as improvements would occur by property owners on private property
- Alternatives 2, and 3 do not significantly decrease the flooding risk within the Stage 2 catchment area
- Alternative 4 is the most expensive; it will decrease the flooding risk, but at a significant cost.
- Provides targeted improvements that address flooding issues as needed

SLIDE 12 (Private Drainage Solutions)

Under normal rainfall events, the storm sewer systems operate as designed. However, during extreme storms, the following takes place:

- Areas surrounding foundation walls become saturated with water.
- Private drainage systems are potentially deficient (i.e. – cracked pipes, sump pump failure, tree roots, grading around the house, etc.)
- In low lying areas, water accumulates (ponds) and enters the stormwater system through manhole covers or cleanouts.

The most effective way to reduce the risk of private property flooding involves:

- Maintain/Improve private drainage systems to ensure adequate drainage of surface, roof and groundwater around the home, towards the Town's stormwater system. The following are flood risk mitigation opportunities for property owners to consider:
 - Maintaining private drainage systems
 - Adding storage capacity
 - Private drainage system maintenance
 - Sump pump system with backflow preventor (check valve)
 - Downspout Disconnection

SLIDE 13 (Improvement Opportunities - Private Property Flooding Mitigation)

Opportunities to mitigate private property flooding include *maintaining private drainage systems*, and *adding storage capacity*.

Maintaining private drainage systems to ensure that surface water and groundwater surrounding the home is directed away from the home and towards the roadway/storm sewer system.

Adding storage capacity within the system to temporarily detain runoff from high intensity rainfall events and reduce peak flows to the storm sewer.

SLIDE 14 (Improvement Opportunities - Maintaining & Improving Private Drainage Systems)

Opportunities to maintain and improve private drainage systems include *private drainage system regular maintenance*, adding a *sump pump system*, and *downspout disconnection*.

Periodic maintenance and repairs to private drainage systems is important to ensure that surface water and groundwater surrounding the home is directed away from the home and towards the roadway/storm sewer system. Some maintenance/repair items include;

- cracked pipes, cracked basement walls, sump pump system, blockages from tree roots, sanitary backflow valve, poor grading around the house, etc.

Sump Pump System - In the event of a power outage, a backup sump pump system is strongly recommended. It is also recommended to have a sump pump discharging to the ground surface.

When feasible, disconnection of the roof downspouts from the underground sewer system can significantly reduce the direct inflow of water to the private drainage system. However, care must be taken to direct roof water to the street and/or rear yard drainage inlet and not onto a neighbouring property.

Slide 15 (Next Steps)

In terms of next steps, the project team will:

- Review input received from this PIC
- Prepare the Stage 2 Summary Report for 30-day public review
- Issue the Notice of Study Completion for Stage 2
- Continue with the stormwater assessment and alternative solutions development for Stage 3

The Stage 2 Draft Report is expected to be available for public review in the fall/winter of 2023.

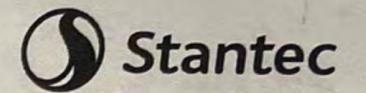
Slide 16 (Thank you)

We encourage you to submit any comments or questions to the project team by July 20, 2023.

Thank you for watching this video presentation and for your interest in the Stage 2 Detroit River Storm Sewer Outfalls Stormwater Master Plan and Class Environmental Assessment Study! Your input is very important to us.



Public Information Centre Sign-In
LaSalle Detroit River Storm Sewer Outfalls
Master Plan and Environmental Assessment Study
Town of LaSalle Town Hall – June 20, 2023



Name / Title	Address	Contact Information (Email/Phone)
Al BAIN	1440 OUTRAM	519-978-2224
Jeff Lambing	7111 Matchette	519-919-7391
GEORGE GRAMADA	7115 MATCHETTE	519 734-7984
Sara Grondin	7775 Lafontaine Lane	519-562-0440.
Chris + Charlotte Blundette	254 Sunnyside Blvd	248-519-3063
ALAIN MICHAUD	535 HERDMAN ST.	
Sam GEORGE	21 Adams Lane	514 362-1272
Bl	Matchette	519 734 6983
Victoria Huang	1295 Lyons Ave, LaSalle	519-328-0986
Li Yuan		

COMMENT FORM
LaSalle Detroit River Storm Sewer Outfalls Stage 2
Master Plan and Environmental Assessment Study
Public Information Centre, Town of LaSalle Town Hall

Thank you for sharing the results of the study.
It is nice to see that LaSalle takes the time
and energy to validate spending before committing.
We agree with the assessment regarding the
Stage 2 Study and want to thank you for
a job well done.

- Response Requested
 Response Not Required

Please leave your completed comment sheet in the drop box provided or submit
(by July 20, 2023) to either of the project team contacts below:

Steve Brown, MBA, P.Eng
Project Manager
Stantec Consulting Ltd.
Tel.: (519) 585-7446
Email: steve.brown@stantec.com

Jonathan Osborne, P.Eng
Director of Public Works
Town of LaSalle
Tel: 519-969-7770 ext. 1255
Email: josborne@lasalle.ca

Name and Address (optional) PLEASE PRINT

Chris & Charlotte Blanchette

Name:

Mailing Address: 254 Sunnyside Blvd.

(include postal code) LaSalle, Ontario N9J 3J2

Tel: 519-734-0400 Fax:

Email: chrisinlasalle@gmail.com
charinlasalle@gmail.com

Comment Log

Town of LaSalle – Stormwater Master Plan (SWMP) Stage 2
Municipal Class Environmental Assessment Study, Schedule “B”
Communication Log

Contact	Date	Comment	Draft Response/ Status
Agency			
Secondarylanduse@hydroone.com	June 28, 2023 Email	<p>Thank you for sending us notification regarding (LaSalle Detroit River Storm Sewer Outfalls Stormwater Master Plan and Class EA). In our preliminary assessment, we have confirmed that Hydro One has existing distribution assets within your study area.</p> <p>At this time, we do not have sufficient information to comment on the potential resulting impacts that your project may have on our infrastructure. As such, we must stay informed as more information becomes available so that we can advise if any of the alternative solutions present actual conflicts with our assets, and if so; what resulting measures and costs could be incurred by the proponent. Note that this response does not constitute approval for your plans and is being sent to you as a courtesy to inform you that we must continue to be consulted on your project.</p> <p>Hydro One must be consulted during all stages of your project. Please ensure that all future communications about this and future project(s) are sent to us electronically to secondarylanduse@hydroone.com</p>	<p>Email sent June 30, 2023: Thank you for your correspondence – it has been saved in the project file. We will continue to consult Hydro One through secondarylanduse@hydroone.com on this project.</p>
Joseph Harvey Ministry of Citizenship and Multiculturalism	July 20, 2023 Email	<p>Please find attached our initial advice on the above referenced undertaking.</p> <p>Please do not hesitate to contact me with any questions or concerns.</p> <p>*letter appended.</p>	
Public			
Chris & Charlotte Blanchette 241 Sunnyside Blvd LaSalle, ON N9J 3J2 519-734-0400 chrisinlasalle@gmail.com charinlasalle@gmail.com	June 20, 2023 Comment Sheet	<p>Thank you for sharing the results of the study. It is nice to see that LaSalle takes the time and energy to validate spending before committing. We agree with the assessment regarding the Stage 2 Study and want to thank you for a job well done.</p>	No response required.

Indigenous and First Nations Engagement

Town of LaSalle – Stormwater Master Plan (SWMP) – Stage 2 SWMP
Municipal Class Environmental Assessment Study, Schedule “B”
Indigenous Communication Log

Contact	Date	Comment	Draft Response/ Status
Indigenous			
Fallon Burch Consultation Coordinator Chippewas of the Thames First Nation 519-289-5555 ext. 251 consultation@cottfn.com fburch@cottfn.com Chippewas of the Thames First Nation R.R. #1 320 Chippewa Road Muncey, ON N0L 1Y0	NOSC & PIC 1		Email Sent June 6, 2023: Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town’s website, www.lasalle.ca/studies starting June 20. The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation. Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.
	June 6, 2023		
	Email	Email Received June 20, 2023: We have received information concerning the Stage 2 Detroit River Storm Sewer Outfalls Master Plan, dated June 7, 2023. The proposed project is located within the McKee Treaty area to which Chippewas of the Thames First Nation (COTTFN) is a signatory. It is also located within the Big Bear Creek Additions to Reserve (ATR) land selection area, as well as COTTFN Traditional Territory. After reviewing Stage 2 Detroit River Storm Sewer Outfalls Master Plan Notice of Study Commencement, we have minimal concerns with the information that has been presented at this time. We ask that as project updates and/or reports become available that these be shared through NationsConnect with the opportunity to review and provide comments if necessary. If there is an Archaeology Assessment conducted, we require notification and the opportunity to actively participate by sending First Nation Field Liaisons on behalf of this First Nation. We look forward to continuing this open line of communication. To implement meaningful consultation, COTTFN has developed its own protocol - a document and a process that will guide positive working relationships. Please do not hesitate to contact me if you have any questions.	
	Upcoming Master Plan Report	Response March 6, 2024: I have reviewed the information provided, at this time I have no questions or concerns. We look forward to reviewing the Master Plan Report, we will reach if necessary.	NationsConnect Submission February 22, 2024: As you are aware, the Town of LaSalle is completing an Approach #2 Master Plan, Municipal Class Environmental Assessment to assess the stormwater infrastructure draining directly or indirectly into the Detroit River. A Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from effects of stormwater flooding while also protecting the natural environment.
	February 22, 2024		
	Nations Connect		

Town of LaSalle – Stormwater Master Plan (SWMP) – Stage 2 SWMP
Municipal Class Environmental Assessment Study, Schedule “B”
Indigenous Communication Log

		<p>The SWMP is being completed in three stages (please refer to Figure 1 attached for the study area map). Improvements will be identified for each Stage, with the preferred solutions presented at Public Information Centres, and documented in separate SWMP Master Plan reports. The Stage 2 SWMP will review portions of the stormwater drainage system that have a direct connection to the Detroit River or an indirect connection via the Marentette Drain and its tributary drains.</p> <p>Recommendations for the Stage 2 SWMP have been identified. The project team is recommending Private Drainage Solutions for property owners to consider, to reduce flood risk on their private property. These recommendations include the following:</p> <ul style="list-style-type: none"> • Maintaining private drainage systems • Adding storage capacity • Private drainage system maintenance • Sump pump system with backflow preventor (check valve) • Downspout disconnection <p>The improvements recommended in this Stage 2 SWMP will be completed on private property to private drainage systems. As a result, the improvements are exempt from the Class EA process.</p> <p>The Town is preparing the Stage 2 SWMP Master Plan report. Prior to issuing the report for 30-day public review, the Town would like to extend the opportunity to discuss any questions or concerns you may have with the study. If you have any questions, or would like to meet with the project team, please contact Jonathan Osborne, Director of Public Works with the Town of LaSalle, at josborne@lasalle.ca, or by phone at 519-969-7770 ext. 1255.</p> <p>Thank you for your interest in this study. We look forward to hearing from you.</p>	<p>The SWMP is being completed in three stages (please refer to Figure 1 attached for the study area map). Improvements will be identified for each Stage, with the preferred solutions presented at Public Information Centres, and documented in separate SWMP Master Plan reports. The Stage 2 SWMP will review portions of the stormwater drainage system that have a direct connection to the Detroit River or an indirect connection via the Marentette Drain and its tributary drains.</p> <p>Recommendations for the Stage 2 SWMP have been identified. The project team is recommending Private Drainage Solutions for property owners to consider, to reduce flood risk on their private property. These recommendations include the following:</p> <ul style="list-style-type: none"> • Maintaining private drainage systems • Adding storage capacity • Private drainage system maintenance • Sump pump system with backflow preventor (check valve) • Downspout disconnection <p>The improvements recommended in this Stage 2 SWMP will be completed on private property to private drainage systems. As a result, the improvements are exempt from the Class EA process.</p> <p>The Town is preparing the Stage 2 SWMP Master Plan report. Prior to issuing the report for 30-day public review, the Town would like to extend the opportunity to discuss any questions or concerns you may have with the study. If you have any questions, or would like to meet with the project team, please contact Jonathan Osborne, Director of Public Works with the Town of LaSalle, at josborne@lasalle.ca, or by phone at 519-969-7770 ext. 1255.</p> <p>Thank you for your interest in this study. We look forward to hearing from you.</p>
		<p>Email from Erna-Marie Leclair March 13, 2024: COTTFNs Consultation Unit has received notification of the upcoming Stage 2 Storm Water Master Plan Report. It was indicated that it would be beneficial to discuss questions/concerns in regards to this study before the 30 day public review starts.</p> <p>There are particular concerns with this particular Stage of the Master Plan as it relies heavily on the LaSalle residents to perform upgrades/maintenance on their own home drainage systems.</p> <p>Some background regarding this concern...COTTFN has had several meetings with the City of London regarding the sheer amount of overflows and bypasses that occur in the Thames River. They have cited the issues are primarily</p>	<p>Email Response April 4, 2024: Thank you for providing your comments on our EA for this storm master plan. Please see attached letter in response to your comments/concerns regarding the Stage 2 Detroit River Storm Sewer Outfalls Master Plan. If you have any questions please feel free to reach out and we can discuss.</p> <p>Letter: Thank you for your comments on the Town of LaSalle Stage 2 Storm Water Master Plan (SWMP) Municipal Class Environmental Assessment. As the Town of LaSalle doesn't have any combined sewers (where storm drainage is directed into sanitary sewers), the flooding concerns are entirely related to surface drainage. The general findings of the Stage 2 SWMP analysis were that there was little flooding observed within the Study Area, and this is consistent with a general lack of flooding complaints – so overall the drainage system is functioning appropriately. The recommendations of the study are generally good industry practices</p>

		<p>caused by weeping tile connections to sanitary sewers and having combined sewer systems in some areas etc. This has been a problem for many years and at one point the city has offered to pay 100% of the fees associated with sump pump installation and there were surprisingly very few participants. Residents are scared of the work involved with weeping tile disconnection, and/or installing a sump pump that can fail.</p> <p>COTTFNs consultation teams comments/questions include:</p> <ul style="list-style-type: none"> • Has the Town of LaSalle asked residents in the Stage 2 area if they were willing to do this? • How much participation is required to prevent flooding in this area? • Do the residents in this area have the ability to pay for the upgrades/maintenance? Will the Town of LaSalle offer to help pay for these services via grants? <ul style="list-style-type: none"> ○ COTTFN Consultation Unit recommends the town of LaSalle to meet with the City of London to discuss the issues with having a solution reliant on voluntary resident participation • Is there a back up plan if this option is not sufficient to stop the flooding concerns in this area? <p>Water holds profound significance for COTTFN and other First Nations, representing not just a vital resource but a living entity with spirit. It also plays a central role in cultural and spiritual rituals and therefore the health of the water in COTTFN's Treaty and Traditional territory is important.</p> <p>If you would like to schedule a meeting to address these concerns, please reach out.</p>	<p>intended to encourage drainage improvements by individuals to enhance private property flooding protection at the lot level. The following provides responses to your specific questions:</p> <ol style="list-style-type: none"> 1. Has the Town of LaSalle asked residents in the Stage 2 area if they were willing to do this? <ul style="list-style-type: none"> ○ The recommended solution was advertised and presented at a Public Information Centre on June 20, 2023. No direct objections or concerns to this preferred alternative were brought forward. 2. How much participation is required to prevent flooding in this area? <ul style="list-style-type: none"> ○ The recommended improvements are intended to provide homeowners with solutions to address private property flooding concerns, potentially caused by ineffective home drainage systems. Because there was limited systemic flooding observed in the Stage 2 area, the purpose of the recommendation is to enhance flooding protection for individual lots – there is no minimum uptake requirement to prevent flooding in other locations. 3. Do the residents in this area have the ability to pay for the upgrades/maintenance? Will the Town of LaSalle offer to help pay for these services via grants? <ul style="list-style-type: none"> ○ This recommended approach was presented to the public and there has been no responses indicating a lack of ability to pay for improvements. The Town of LaSalle will continue to monitor demand for a financial assistance program (grants or other) and consider if it is deemed appropriate 4. COTTFN Consultation Unit recommends the Town of LaSalle to meet with the City of London to discuss the issues with having a solution reliant on voluntary resident participation. <ul style="list-style-type: none"> ○ The Town is in regular communication with the City of Windsor, who have similar programs and understand some of their challenges and limitations. Should the Town consider implementing a financial assistance program, more detailed discussions will be undertaken. 5. Is there a back up plan if this option is not sufficient to stop the flooding concerns in this area? <ul style="list-style-type: none"> ○ Because there was limited systemic flooding observed in the Stage 2 area, the purpose of the recommendation is to enhance flooding protection for individual lots – there is no minimum uptake requirement to prevent flooding in other locations so a back-up plan was not considered necessary. <p>We hope these responses have sufficiently addressed your questions/concerns. We would be happy to meet with you directly (in person or virtually) for further discussion if that would be helpful.</p>
	February 26, 2024		Left Voicemail February 26, 2024:

Town of LaSalle – Stormwater Master Plan (SWMP) – Stage 2 SWMP
Municipal Class Environmental Assessment Study, Schedule “B”
Indigenous Communication Log

	Phone Call		Voicemail followed up on the letter sent through Nations Connect to confirm receipt. Also noted the purpose of the letter, and to let the project team know if they have any comments or concerns with the study. Asked if they could please contact us through email, phone, or Nations Connect.
	NOSC (completion)		
Chief Chris Plain Chief.plain@amjwinaang.ca Aamjiwinaang First Nation 978 Tashmoo Avenue Sarnia, ON N7T 7H5	NOSC & PIC 1		Email Sent June 6, 2023: Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town’s website, www.lasalle.ca/studies starting June 20. The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation. Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.
	June 6, 2023 Email		
	Upcoming Master Plan Report		Email Sent February 22, 2024: As you are aware, the Town of LaSalle is completing an Approach #2 Master Plan, Municipal Class Environmental Assessment to assess the stormwater infrastructure draining directly or indirectly into the Detroit River. A Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from effects of stormwater flooding while also protecting the natural environment. The SWMP is being completed in three stages (please refer to Figure 1 attached for the study area map). Improvements will be identified for each Stage, with the preferred solutions presented at Public Information Centres, and documented in separate SWMP Master Plan reports. The Stage 2 SWMP will review portions of the stormwater drainage system that have a direct connection to the Detroit River or an indirect connection via the Marentette Drain and its tributary drains. Recommendations for the Stage 2 SWMP have been identified. The project team is recommending Private Drainage Solutions for property owners to consider, to reduce flood risk on their private property. These recommendations include the following: <ul style="list-style-type: none"> • Maintaining private drainage systems • Adding storage capacity • Private drainage system maintenance • Sump pump system with backflow preventor (check valve) • Downspout disconnection The improvements recommended in this Stage 2 SWMP will be completed on private property to private drainage systems. As a result, the improvements are exempt from the Class EA process.
	Email February 22, 2024		

Town of LaSalle – Stormwater Master Plan (SWMP) – Stage 2 SWMP
Municipal Class Environmental Assessment Study, Schedule “B”
Indigenous Communication Log

			<p>The Town is preparing the Stage 2 SWMP Master Plan report. Prior to issuing the report for 30-day public review, the Town would like to extend the opportunity to discuss any questions or concerns you may have with the study. If you have any questions, or would like to meet with the project team, please contact Jonathan Osborne, Director of Public Works with the Town of LaSalle, at josborne@lasalle.ca, or by phone at 519-969-7770 ext. 1255.</p> <p>Thank you for your interest in this study. We look forward to hearing from you.</p>
		<p>Email Response February 23, 2024 Thanks for the email. I've copied our consultation worker, Courtney on this and we'll take a look and get back to you.</p>	<p>Email Response February 23, 2024: Thank you for your response. Should you have any questions, comments, or concerns, please don't hesitate to contact a member of the project team.</p>
<p>Bkejwanong Territory (Walpole Island) R.R. #3 117 Tahgahoning Road Walpole Island, ON N84 4K9</p>	<p>NOSC (completion) NOSC & PIC 1 June 6, 2023 Email</p>		<p>Email Sent June 6, 2023: Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town's website, www.lasalle.ca/studies starting June 20. The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation. Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.</p>
	<p>Upcoming Master Plan Report Email February 22, 2024</p>		<p>Email Sent February 22, 2024: As you are aware, the Town of LaSalle is completing an Approach #2 Master Plan, Municipal Class Environmental Assessment to assess the stormwater infrastructure draining directly or indirectly into the Detroit River. A Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from effects of stormwater flooding while also protecting the natural environment. The SWMP is being completed in three stages (please refer to Figure 1 attached for the study area map). Improvements will be identified for each Stage, with the preferred solutions presented at Public Information Centres, and documented in separate SWMP Master Plan reports. The Stage 2 SWMP will review portions of the stormwater drainage system that have a direct connection to the Detroit River or an indirect connection via the Marentette Drain and its tributary drains.</p> <p>Recommendations for the Stage 2 SWMP have been identified. The project team is recommending Private Drainage Solutions for property owners to consider, to reduce flood risk on their private property. These recommendations include the following:</p> <ul style="list-style-type: none"> • Maintaining private drainage systems

Town of LaSalle – Stormwater Master Plan (SWMP) – Stage 2 SWMP
Municipal Class Environmental Assessment Study, Schedule “B”
Indigenous Communication Log

			<ul style="list-style-type: none"> • Adding storage capacity • Private drainage system maintenance • Sump pump system with backflow preventor (check valve) • Downspout disconnection <p>The improvements recommended in this Stage 2 SWMP will be completed on private property to private drainage systems. As a result, the improvements are exempt from the Class EA process.</p> <p>The Town is preparing the Stage 2 SWMP Master Plan report. Prior to issuing the report for 30-day public review, the Town would like to extend the opportunity to discuss any questions or concerns you may have with the study. If you have any questions, or would like to meet with the project team, please contact Jonathan Osborne, Director of Public Works with the Town of LaSalle, at josborne@lasalle.ca, or by phone at 519-969-7770 ext. 1255.</p> <p>Thank you for your interest in this study. We look forward to hearing from you.</p>
	Phone Call		
	February 26, 2024		<p>Phone Call February 26, 2024: Spoke on February 26, 2024 and asked if they anticipate having any comments/concerns related to this study. They will review the letter and will contact the project team if they have any comments to discuss further.</p>
	NOSC (completion)		
<p>Caldwell First Nation 14 Orange Street Leamington, ON N8H 1P5</p>	NOSC & PIC 1		
	June 6, 2023		
	Email		<p>Email Sent June 6, 2023: Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town’s website, www.lasalle.ca/studies starting June 20.</p> <p>The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation. Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.</p>
		<p>Email Received June 8, 2023: Caldwell First Nation does not attend public information sessions, and is instead entitled to separate engagement and participation through Consultation and Accommodation provisions. We intend to review your project and examine whether there is a necessity for further community engagement at the First Nation. See our attached technical review and fieldwork participation agreements for you to review, fill with your project information, and return for approval. Our agreements cover our material review and any necessary field participation and administration in most EA and CRM projects.</p>	<p>Email Response June 12, 2023: Thanks for your email below and I’m happy to provide you with some additional information related to this project on behalf of the project team. The Town is currently working on a series of three Stormwater Master Plans for various areas within the Town of LaSalle. The current study is Stage 2, and the purpose of the notice you received is to advise you of the purpose of the study and of the PIC scheduled for June 20. If you want or need additional consultation related to this project, that can be arranged. At this stage of the project, there is no anticipated fieldwork and therefore we are not sure how to proceed with the draft agreements you provided in your message. If you would like the opportunity to review the final project report (anticipated for fall 2023), that can be arranged, but please advise, so we</p>

Town of LaSalle – Stormwater Master Plan (SWMP) – Stage 2 SWMP
Municipal Class Environmental Assessment Study, Schedule “B”
Indigenous Communication Log

			<p>can coordinate any agreements and exchange of information properly. Additionally, we have submitted the project information through the consultwithcaldwell.ca portal, so the information should be there as well. We look forward to hearing from you. Thanks.</p>
		<p>Email Received June 16, 2023: We are interested in participating in stormwater management project review, considering stormwater plans' potential for impact to ecosystems and waterways. If there is no fieldwork, this means we need only sign the Technical Review Agreement once you've filled out your project details and parameters. We can then begin reviewing any additional materials in preparation for your Fall report to avoid causing any delays to you.</p>	
	<p>Upcoming Master Plan Report Email Consult with Caldwell February 22, 2024</p>		<p>Email Sent February 22, 2024: Email: As you are aware, the Town of LaSalle is completing an Approach #2 Master Plan, Municipal Class Environmental Assessment to assess the stormwater infrastructure draining directly or indirectly into the Detroit River. A Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from effects of stormwater flooding while also protecting the natural environment.</p> <p>The Town is preparing the Stage 2 SWMP Master Plan report. Prior to issuing the report for 30-day public review, the Town would like to extend the opportunity to discuss any questions or concerns you may have with the study.</p> <p>Please find the attached letter correspondence, which has also been uploaded to the www.consultwithcaldwell.ca website under the Project File for this study.</p> <p>If you have any questions, or would like to meet with the project team, please contact Jonathan Osborne, Director of Public Works with the Town of LaSalle, at josborne@lasalle.ca, or by phone at 519-969-7770 ext. 1255.</p> <p>Letter: As you are aware, the Town of LaSalle is completing an Approach #2 Master Plan, Municipal Class Environmental Assessment to assess the stormwater infrastructure draining directly or indirectly into the Detroit River. A Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from effects of stormwater flooding while also protecting the natural environment.</p> <p>The SWMP is being completed in three stages (please refer to Figure 1 attached for the study area map). Improvements will be identified for each Stage, with the preferred solutions presented at Public Information Centres, and documented in separate SWMP Master Plan reports. The Stage 2 SWMP will review portions of the stormwater drainage system that</p>

Town of LaSalle – Stormwater Master Plan (SWMP) – Stage 2 SWMP
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			<p>have a direct connection to the Detroit River or an indirect connection via the Marentette Drain and its tributary drains.</p> <p>Recommendations for the Stage 2 SWMP have been identified. The project team is recommending Private Drainage Solutions for property owners to consider, to reduce flood risk on their private property. These recommendations include the following:</p> <ul style="list-style-type: none"> • Maintaining private drainage systems • Adding storage capacity • Private drainage system maintenance • Sump pump system with backflow preventor (check valve) • Downspout disconnection <p>The improvements recommended in this Stage 2 SWMP will be completed on private property to private drainage systems. As a result, the improvements are exempt from the Class EA process.</p> <p>The Town is preparing the Stage 2 SWMP Master Plan report. Prior to issuing the report for 30-day public review, the Town would like to extend the opportunity to discuss any questions or concerns you may have with the study. If you have any questions, or would like to meet with the project team, please contact Jonathan Osborne, Director of Public Works with the Town of LaSalle, at josborne@lasalle.ca, or by phone at 519-969-7770 ext. 1255.</p> <p>Thank you for your interest in this study. We look forward to hearing from you.</p>
	<p>February 26, 2024</p> <p>Phone Call</p> <p>NOSC (completion)</p>		<p>Left voicemail with Zach Hamm. No response.</p>
<p>Kettle and Stony Point First Nation 6247 Indian Lane Kettle and Stony Point FN, ON N0N 1J1</p>	<p>NOSC & PIC 1</p> <p>June 6, 2023</p> <p>Email</p>		<p>Email Sent June 6, 2023: Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town’s website, www.lasalle.ca/studies starting June 20.</p> <p>The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation. Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.</p>
	<p>Upcoming Master Plan Report</p> <p>Email</p>		<p>Email Sent February 22, 2024: As you are aware, the Town of LaSalle is completing an Approach #2 Master Plan, Municipal Class Environmental Assessment to assess the stormwater infrastructure draining directly or indirectly into the Detroit</p>

Town of LaSalle – Stormwater Master Plan (SWMP) – Stage 2 SWMP
Municipal Class Environmental Assessment Study, Schedule “B”
Indigenous Communication Log

	February 22, 2024		<p>River. A Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from effects of stormwater flooding while also protecting the natural environment.</p> <p>The SWMP is being completed in three stages (please refer to Figure 1 attached for the study area map). Improvements will be identified for each Stage, with the preferred solutions presented at Public Information Centres, and documented in separate SWMP Master Plan reports. The Stage 2 SWMP will review portions of the stormwater drainage system that have a direct connection to the Detroit River or an indirect connection via the Marentette Drain and its tributary drains.</p> <p>Recommendations for the Stage 2 SWMP have been identified. The project team is recommending Private Drainage Solutions for property owners to consider, to reduce flood risk on their private property. These recommendations include the following:</p> <ul style="list-style-type: none"> • Maintaining private drainage systems • Adding storage capacity • Private drainage system maintenance • Sump pump system with backflow preventor (check valve) • Downspout disconnection <p>The improvements recommended in this Stage 2 SWMP will be completed on private property to private drainage systems. As a result, the improvements are exempt from the Class EA process.</p> <p>The Town is preparing the Stage 2 SWMP Master Plan report. Prior to issuing the report for 30-day public review, the Town would like to extend the opportunity to discuss any questions or concerns you may have with the study. If you have any questions, or would like to meet with the project team, please contact Jonathan Osborne, Director of Public Works with the Town of LaSalle, at josborne@lasalle.ca, or by phone at 519-969-7770 ext. 1255.</p> <p>Thank you for your interest in this study. We look forward to hearing from you.</p>
	February 26, 2024 Phone Call		<p>Phone Call February 26, 2024: Spoke with front desk. They ask that I email Verna George to handle interim consultation, and she will respond to my email. Verna.george@kettlepoint.org</p>
	February 26, 2024 Email		<p>Email Sent February 26, 2024 (to Verna George): I'm forwarding this email in regards to the upcoming Master Plan Report for the Stage 2 Stormwater Master Plan study being undertaken by the Town of LaSalle. I just spoke with your front desk, and they informed me I should forward this email and letter on to yourself.</p> <p>The Town would like to extend an opportunity to discuss any questions or concerns Kettle & Stony Point First Nation may have related to this study. If</p>

Town of LaSalle – Stormwater Master Plan (SWMP) – Stage 2 SWMP
Municipal Class Environmental Assessment Study, Schedule “B”
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			you have any questions, or would like to meet with the project team, please contact Jonathan Osborne, Director of Public Works with the Town of LaSalle, at josborne@lasalle.ca , or by phone at 519-969-7770 ext. 1255.
	NOSC (completion)		
Munsee-Delaware Nation R.R. #1 289 Jubilee Road Muncey, ON N0L 1Y0	NOSC & PIC 1		Email Sent June 6, 2023: Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town’s website, www.lasalle.ca/studies starting June 20. The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation. Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.
	June 6, 2023 Email		
	Upcoming Master Plan Report		Email Sent February 22, 2024: As you are aware, the Town of LaSalle is completing an Approach #2 Master Plan, Municipal Class Environmental Assessment to assess the stormwater infrastructure draining directly or indirectly into the Detroit River. A Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from effects of stormwater flooding while also protecting the natural environment. The SWMP is being completed in three stages (please refer to Figure 1 attached for the study area map). Improvements will be identified for each Stage, with the preferred solutions presented at Public Information Centres, and documented in separate SWMP Master Plan reports. The Stage 2 SWMP will review portions of the stormwater drainage system that have a direct connection to the Detroit River or an indirect connection via the Marentette Drain and its tributary drains. Recommendations for the Stage 2 SWMP have been identified. The project team is recommending Private Drainage Solutions for property owners to consider, to reduce flood risk on their private property. These recommendations include the following: <ul style="list-style-type: none"> • Maintaining private drainage systems • Adding storage capacity • Private drainage system maintenance • Sump pump system with backflow preventor (check valve) • Downspout disconnection The improvements recommended in this Stage 2 SWMP will be completed on private property to private drainage systems. As a result, the improvements are exempt from the Class EA process.
	Email February 22, 2024		

Town of LaSalle – Stormwater Master Plan (SWMP) – Stage 2 SWMP
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			<p>The Town is preparing the Stage 2 SWMP Master Plan report. Prior to issuing the report for 30-day public review, the Town would like to extend the opportunity to discuss any questions or concerns you may have with the study. If you have any questions, or would like to meet with the project team, please contact Jonathan Osborne, Director of Public Works with the Town of LaSalle, at josborne@lasalle.ca, or by phone at 519-969-7770 ext. 1255.</p> <p>Thank you for your interest in this study. We look forward to hearing from you.</p>
	February 26, 2024		
	Phone Call		
	NOSC (completion)		
Delaware Nation at Moraviantown 14760 School House Line, RR3 Thamesville, ON, N0P 2K0	NOSC & PIC 1		<p>Left Voicemail with Stacey Phillips February 26, 2024: Voicemail noted purpose of the letter sent – to discuss any comments/questions/concerns they may have related to the Town’s study. Provided phone number so they can call back, and asked they confirm receipt by email or returning phone call.</p>
	June 6, 2023		
	Email		<p>Email Sent June 6, 2023: Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town’s website, www.lasalle.ca/studies starting June 20.</p> <p>The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation. Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.</p>
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	February 26, 2024		
	Phone Call		<p>Phone Call February 26, 2024: Spoke with reception. They noted that if the Chief determines there is interest in our study, they will contact us with any follow up comments/questions (no need to continue to call to follow up).</p>
	NOSC (completion)		
<p>Oneida Nation of the Thames 2212 Elm Avenue Southwold, ON NOL 2G0</p>	<p>NOSC & PIC 1</p> <p>June 6, 2023</p> <p>Email</p>		<p>Email Sent June 6, 2023: Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town’s website, www.lasalle.ca/studies starting June 20.</p> <p>The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation. Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.</p>
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	<p>February 26, 2024</p> <p>Phone Call</p>		<p>Phone Call February 26, 2024: Spoke with Janelle Cornelius assistant. She noted that she will ask Janelle to respond to my email or give me a call back if she has any questions/comments/concerns related to the study.</p>
<p>Metis Nation of Ontario consultations@metisnation.org</p>	<p>NOSC (completion) NOSC & PIC 1</p> <p>June 6, 2023</p> <p>Email</p>		<p>Email Sent June 6, 2023: Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town’s website, www.lasalle.ca/studies starting June 20.</p> <p>The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation. Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.</p>

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	<p>NOSC (completion)</p>		

From: [Brown, Steve \(Waterloo\)](#)
To: [Micks, Sarah](#)
Cc: [Hohner, Paula](#); [Bartlett, Curtis](#)
Subject: FW: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA
Date: Friday, June 16, 2023 3:39:36 PM

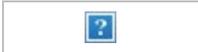
FYI, response from Caldwell First Nation.

Steve.

Steve Brown MBA, P.Eng.
Surface Water Lead, Canada East

Direct: 519 585-7446
Mobile: 519 577-2551
steve.brown@stantec.com

Stantec
100-300 Hagey Boulevard
Waterloo ON N2L 0A4



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From: Zack Hamm <ecd.manager@caldwellfirstnation.ca>
Sent: Friday, June 16, 2023 9:11 AM
To: Brown, Steve (Waterloo) <steve.brown@stantec.com>
Cc: ecc@caldwellfirstnation.ca; Peter Marra <pmarra@lasalle.ca>; Jonathan Osborne <josborne@lasalle.ca>; Michael McMaster <ecd.assistant@caldwellfirstnation.ca>
Subject: Re: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA

Good morning Steve,

We are interested in participating in stormwater management project review, considering stormwater plans' potential for impact to ecosystems and waterways. If there is no fieldwork, this means we need only sign the Technical Review Agreement once you've filled out your project details and parameters. We can then begin reviewing any additional materials in preparation for your Fall report to avoid causing any delays to you.

Best,

Zack Hamm
Environment and Consultation Department Manager
Environment and Consultation Department (ECD)



Caldwell First Nation
14 Orange Street
Leamington | ON | N8H 1P5
Phone: 226-936-2940
ecd.manager@caldwellfirstnation.ca

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On Mon, Jun 12, 2023 at 4:38 PM Brown, Steve (Waterloo) <steve.brown@stantec.com> wrote:

Hello Zack. Thanks for your email below and I'm happy to provide you with some additional information related to this project on behalf of the project team. The Town is currently working on a series of three Stormwater Master Plans for various areas within the Town of LaSalle. The current study is Stage 2, and the purpose of the notice you received is to advise you of the purpose of the study and of the PIC scheduled for June 20. If you want or need additional consultation related to this project, that can be arranged. At this stage of the project, there is no anticipated fieldwork and therefore we are not sure how to proceed with the draft agreements you provided in your message. If you would like the opportunity to review the final project report (anticipated for fall 2023), that can be arranged, but please advise, so we can coordinate any agreements and exchange of information properly. Additionally, we have submitted the project information through the consultwithcalwell.ca portal, so the information should be there as well. We look forward to hearing from you. Thanks.

Steve.

Steve Brown MBA, P.Eng.
Surface Water Lead, Canada East

Direct: 519 585-7446
Mobile: 519 577-2551
steve.brown@stantec.com

Stantec
100-300 Hagey Boulevard
Waterloo ON N2L 0A4



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From: Zack Hamm <ecd.manager@caldwellfirstnation.ca>
Sent: Thursday, June 8, 2023 2:40 PM
To: Brown, Steve (Waterloo) <steve.brown@stantec.com>
Cc: ecc@caldwellfirstnation.ca; Peter Marra <pmarra@lasalle.ca>; Jonathan Osborne <josborne@lasalle.ca>; Michael McMaster <ecd.assistant@caldwellfirstnation.ca>
Subject: Re: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA

Good afternoon, Steve,

Caldwell First Nation does not attend public information sessions, and is instead entitled to separate engagement and participation through Consultation and Accommodation provisions. We intend to review your project and examine whether there is a necessity for further community engagement at the First Nation. See our attached technical review and fieldwork participation agreements for you to review, fill with your project information, and return for approval. Our agreements cover our material review and any necessary field participation and administration in most EA and CRM projects.

Additionally, for future reference, our first point of contact is the consultwithcaldwell.ca portal, where you should upload engagement requests and materials before resorting to email.

Best,

Zack Hamm

Environment and Consultation Department Manager

Environment and Consultation Department (ECD)



Caldwell First Nation

14 Orange Street

Leamington | ON | N8H 1P5

Phone: 226-936-2940

ecd.manager@caldwellfirstnation.ca

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On Tue, Jun 6, 2023 at 11:32 AM Micks, Sarah <Sarah.Micks@stantec.com> wrote:

Hello,

Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town's website, www.lasalle.ca/studies starting June 20.

The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation.

Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.

Thank you,

Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

Stantec



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From: [Chippewas of the Thames First Nation](#)
To: fburch@cottfn.com; jmills@cottfn.com; emleclair@cottfn.com; [Micks, Sarah](#); [Brown, Steve \(Waterloo\)](#); [Peter Marra](#); [Jonathan Osborne](#)
Subject: Decision regarding consultation: 161414064 - Stage 2 Detroit River Storm Sewer Outfalls Master Plan
Date: Tuesday, June 20, 2023 2:39:41 PM
Attachments: [consultation-response-33379-161414064-20230620-1435.pdf](#)
[Wiindmaagewin-CONSULTATION-PROTOCOL-website.pdf](#)

Please see attached PDF response letter. As per 'Appendix D' of the Wiindmaagewin Consultation Protocol, we will be sending an invoice based on our time to engage in the consultation process. The invoice will be sent from COTTFN's Finance Department.

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From: [Micks, Sarah](#)
To: ecc@caldwellfirstnation.ca; [Zack Hamm](#)
Cc: [Peter Marra](#); [Jonathan Osborne](#); [Brown, Steve \(Waterloo\)](#)
Subject: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA
Date: Tuesday, June 6, 2023 11:32:00 AM
Attachments: [ad_lasalle_fnl_20230605.pdf](#)

Hello,

Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town's website, www.lasalle.ca/studies starting June 20.

The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation.

Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.

Thank you,

Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

Stantec



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Deshkan Ziibiing
Chippewas of the Thames
First Nation Treaties, Lands
and Environment

320 Chippewa Road
Muncey, ON, N0L 1Y0
Tel: 519-289-5555
Fax: 519-289-2230
info@cottfn.com

Project Name:

Stage 2 Detroit River Storm Sewer Outfalls Master Plan

FN Consultation ID:

161414064

Consulting Org Contact:

Sarah Lang
Steve Brown

Consulting Organization:

[Stantec](#)

Date Received:

Wednesday, June 7, 2023

June 20, 2023

Dear: Sarah,

We have received information concerning the Stage 2 Detroit River Storm Sewer Outfalls Master Plan, dated June 7, 2023. The proposed project is located within the McKee Treaty area to which Chippewas of the Thames First Nation (COTTFN) is a signatory. It is also located within the Big Bear Creek Additions to Reserve (ATR) land selection area, as well as COTTFN Traditional Territory.

After reviewing Stage 2 Detroit River Storm Sewer Outfalls Master Plan Notice of Study Commencement, we have minimal concerns with the information that has been presented at this time. We ask that as project updates and/or reports become available that these be shared through NationsConnect with the opportunity to review and provide comments if necessary.

If there is an Archaeology Assessment conducted, we require notification and the opportunity to actively participate by sending First Nation Field Liaisons on behalf of this First Nation.

We look forward to continuing this open line of communication. To implement meaningful consultation, COTTFN has developed its own protocol - a document and a process that will guide positive working relationships.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Original Signed

Fallon Burch

Consultation Coordinator

Chippewa of the Thames First Nation

320 Chippewa Road, Muncey, ON, N0L 1Y0

(519) 289-5555 Ext 251

fburch@cottfn.com

Deshkan Ziibiing/Chippewas of the Thames First Nation

Wiindmaagewin

CONSULTATION PROTOCOL

Final

26 November 2016



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1. Introduction and purpose

The watersheds of southwestern Ontario have been the home of Anishinaabe people for millennia. Widespread archaeological evidence of the “Western Basin Late Woodland Tradition” confirms our traditional oral history teachers’ accounts of this lengthy Anishinaabe dwelling in our territory of Waawayaatanong, or “Round Lake.” This region is known as the third stopping place of the Water Drum on its sacred journey to Madeline Island, centuries before the era of colonization. We have continued to dwell here despite the disruptions stemming from conflicts with other Anishinaabe nations also dwelling near the Great Lakes, from the wars between various settler powers between 1757 and 1815, and from the imposition of Britain’s, then the United States’, and Canada’s colonial rule.

Deshkan Ziibiing edbendaagzijig, “those that belong to Antler River” (The Chippewas of the Thames First Nation) comprise one of the traditional Anishinaabe nations governing the territory of Waawayaatanong, collectively known now as the Waawayaatanong Anishnaabeg Southwest Treaty Council. As a governing body, Deshkan Ziibiing has lengthy experience in developing relations with other communities interested in the lands and waters of Waawayaatanong, as early French explorers recognized, and as our historic treaty-making with Britain demonstrates.

The purpose of this protocol is to ensure that our relationships with other communities develop in the future in ways that are fully respectful of the breadth of Deshkan Ziibiing’s responsibilities to these watersheds, and ways that are protective of the full range of our rights. This protocol shall serve to guide governments and third parties interested in pursuing healthy and mutually beneficial relationships with Deshkan Ziibiing.

2. Statement of reserved rights

The rights that Deshkan Ziibiing exercises in relation to our ancestral lands, treaty lands, reserve lands, and Addition to Reserve lands, are inherent, grounded most basically in the Creator’s gift of lands, waters, and way of life to ndodeminaanig, “our clans.” These rights are embodied in our historical and ongoing occupation of our territory, and in our practice of self-determination as a people. Our rights as a self-determining people are also recognized within, although they are certainly not created by, the formation of several treaties, the terms of constitutional documents, and international conventions, including Article three of the Jay Treaty (1794). Our historic treaty partner, Britain, recognized these rights, as seen within the joint context of the Royal Proclamation of 1763 and the Treaty of Niagara, 1764; and within the subsequent treaties formed between 1790 and 1827. Our traditional understanding of these treaties with Britain indicates that they in no way eliminate our own rightful control of, and enduring ability to benefit from, the lands and waters within our territory. Section 35(1) of *Canada’s Constitution Act, 1982*, also clearly recognizes these rights, as do the expressions of international customary law elaborated within the *United Nations Declaration on the Rights of Indigenous Peoples (2007)*. This present protocol neither contains nor implies anything that subtracts or derogates from the fullest understanding of the range of rights found within those legal instruments, or within our traditional and customary law.

3. Territory

Traditional Anishinaabe territory in southwestern Ontario north of the Thames River includes the 2.78 million acres marked on the treaty maps concerning the Longwoods (1822) and Huron (1827) tracts. In addition, south of the Thames River, traditional territory also includes the lands addressed in the McKee Treaty (1790), the London Township Treaty (1796), and the Sombra Township Treaty (1796). Deshkan Zibiing is party with other Anishinaabe nations to several of these treaties, but is the sole Anishinaabe party to the Longwoods Treaty.

As recognized in these treaties, the ancestral lands of Deshkan Zibiing thus include all the lands and waters between Lake Huron to the north and Lake Erie to the south, and stretching eastward from the eastern banks of the St. Clair and Detroit rivers to the Mississaugas of New Credit 1792 treaty lands, a line running northwards from Point Bruce on the Erie shore, to Point Clark on the Huron shore (see Appendix A for map). In addition, Deshkan Zibiing territory extended into what are now the American states of Michigan and Ohio. Historically, we managed portions of our territory in common with other Anishinaabe nations, and at times in partnership with the Haudenosaunee. Nevertheless, the lands bordering the northern bank of the Thames River have been solely in the stewardship and possession of Deshkan Zibiing since before the treaty era.

Upper Canada's settlement and development from the early nineteenth century certainly transformed much of this land from its pre-treaty state. Nevertheless, we who are Deshkan Zibiing edbendaagzijig continue to hold our lands, and to assert over the full extent of our treaty lands and traditional territory our historic commitment to the protection of the watersheds of the Thames River, Bear Creek, and the Au Sable River, and to the Erie and Huron lakeshores. For the purposes of this protocol, we regard all of our ancestral lands as part of our consultation territory. As well, our understanding from our elders, an understanding we share with many other Anishinaabe nations, is that our treaties did not "surrender" our lands, despite what Britain and Canada have presumed. As part of our ongoing commitment to these watersheds, the citizens of Deshkan Zibiing are currently engaged in aboriginal title research concerning the bed of the Thames River.

4. Community profile

As a community, Deshkan Zibiing has always welcomed and incorporated people from other nations. Our families have always shared a common world around the Great Lakes with the families of the Pottawatomis and the Odawas. Delawares and Oneidas were welcomed here between 1791 and 1840, and allowed to create their own communities on land adjacent to and within our homeland. At various times, other Haudenosaunee, Shawnees, Huron/Wendats, as well as Anglo or French traders and settlers marrying our people, have all been incorporated into our society. Today, our population is approximately 2,800 people, with 1,000 residing here at Deshkan Zibiing.

Institutions operating within our homeland territory today include a school system with an elected board; a midewigaan (mide lodge), a sundance lodge; the Southwest Ontario Aboriginal Health Access Centre and the Nimkee Nupigawagan Healing Centre; several businesses,

including retail, service and engineering consulting firms; the Chippewa Development Corporation, the Big Bear Creek Trust, and the Thunderbird Trust; as well as police and fire services, government offices, and two churches.

5. Historical Relationships

Deshkan Zibiing has long engaged with other nations, in both war and peace. Prior to European movement into the Great Lakes region, conflict with various Iroquoian-speaking peoples in southern Ontario was also balanced with periods of peace. The creation of the fur trade, however, led to increased warfare with the Haudenosaunee – the Iroquois Confederacy, and to various protective alliances with the Hurons/Wendats, and with other Anishinaabe peoples. Deshkan Zibiing allied with France in its war with Britain in the mid 18th century. Our warriors also fought with Pontiac to protect lands west of the Alleghenies after France withdrew from the Americas. Deshkan Zibiing later allied with Britain in war against the revolutionary American colonies, and then again in the War of 1812 against American expansion into the Great Lakes region. Our ancestors fought during that war with Tecumseh, the great Shawnee leader and advocate for Anishinaabe independence, in order to protect our lands. His descendants are among our citizens today. Following Britain's retreat in 1815, our warriors were the sole defenders of Upper Canada from American incursions. As allies of Britain during the 20th century, our young men also fought and died in two world wars.

Deshkan Zibiing's relationships with other nations have generally been pursued through the creation of treaty partnerships. The oldest of our partnerships, more recently called the Three Fires Confederacy, is one grounded in shared language and joint protection with the Odawa and Potawatomi nations. Gdoonaaganinaan "Our Dish" – formed with the Haudenosaunee; and the Treaty of Montreal – formed with the French and over thirty Anishinaabe nations; ended decades of war and competition over the fur trade, in 1701. These partnerships establishing the foundations of peace were all grounded in mutual respect, and a shared understanding that legal alliances between distinct political communities are created and maintained through ceremony, through appeals to the Creator to attest the sincerity of promises, and through an exchange of wampum belts. Our treaty alliances were most basically a mutual extension of our kinship loyalties and responsibilities, as our gimaag indicated by attaching their doodem symbols to the Longwoods Treaty, and to many others. This extension of kinship to create social and political bonds remains as significant for us today as it was for our ancestors during the tumultuous years of the 17th and 18th centuries.

The great Treaty of Niagara (1764) emerged from this long practice, and is the template for all subsequent treaties between Britain and the Chippewas of the Thames. Its Two Row Wampum, a belt the Haudenosaunee first used with the Dutch in 1613, provides a fuller account of the sort of relationship of equals established between Britain and Chippewas of the Thames than appears in the written texts of the Royal Proclamation (1763), the post-War of 1812 treaties, or within any legislation embodying Canada's unilateral presumption of colonial rule over us.

Deshkan Zibiing made all of its treaties with Britain, and none with Canada, as our elders have emphasized. The legal certainty that Canada has derived from those treaties is weaker than it might be had it undertaken to achieve a common understanding with our people. Apart from

our gimaag having inscribed their doodem symbols on parchment and paper, the treaty texts, and most other documents pertaining to the formation of our treaties, are only available in English. The documentary record contains very little to indicate the fullness of our ancestors' understandings of the treaty process, or of the shameful nature of the post-War of 1812 relationship with Britain, and subsequently with Canada.

Britain's withdrawal from the Ohio valley, and gradual abandonment of its Anishinaabe allies to the colonial administration of Canada, has had a lasting effect on the people of Deshkan Ziiibiing. Colonial rule presumed the 'surrender' of well over 90% of our traditional territory. Efforts to 'civilize' our people, through Canada's unilateral imposition of the Indian Act (1876), confinement through the imposition of the 'Indian Pass' system, harsh policing of our harvesting and hunting practices, and not least, the creation of a residential school on our homeland (Mt. Elgin Industrial Institute, 1851-1946), certainly took a toll on our well-being, and constrained our control and use of our lands and waters. However, throughout the hundred and fifty years of Canada's assertions of sovereignty over our lands and nation, our people have remained insistent on our continued inherent rights. In 2013, Deshkan Ziiibiing resolved a Specific Land Claim dispute with Canada, over its taking of the Big Bear Creek lands in the 1830s. In 2015 the Supreme Court of Canada agreed to consider our objections to the failure of consultation surrounding Enbridge's reversal of flow for Line 9. As the city of London expands, and as the province undertakes a variety of energy development projects, Deshkan Ziiibiing remains intent on protecting our traditional territory. Our vision for the engagement formalized in this protocol remains that of Tecumseh, our treaty chiefs, and the Two Row Wampum. First, we are committed to self-determination regarding the preservation and restoration of our Anishinaabe jurisdiction and heritage. Second, we are committed to the formation of fair partnerships focused on the wise and respectful use of our traditional lands and waters.

6. Principles of intersocietal governance and communication

Our engagement with other communities stems from our recognition of several principles, which derive from our Creator's gifts to us of life and land, and from our Creator having placed us within a world full of relationships with others. Our responsibility to maintain these relationships, in accord with principles derived from our creation story, is central to our continued wellbeing as a people. These principles animated our ancestors in their treaty partnerships historically, and they remain alive today in our dealings with federal, provincial, and municipal bodies. They indicate our fundamental orientation towards all matters of discussion and consultation concerning our rights and responsibilities. They function in addition to, although not in conflict with, the well known principles that Canada's courts have constructed from the common law regarding "the duty to consult and where necessary accommodate" (Haida Nation 2004). The courts have had a difficult time explaining how common law principles serve the task of reconciliation between settlers and Anishinaabe peoples, for they leave parties at odds, and mandate an inherently adversarial process. Our principles, however, grounded in our creation story, do provide a basis for fruitful and healthy intersocietal development, governance, and communication.

a. Principles of governance

(1) Gdinawendimi: “We are all related.” A basic truth of our creation story is that we are related to everything that shares the world with us. Our original Anishinaabe doodem ancestors: Ajijaak “Crane,” Waabizhesh “Marten,” Bneshiinh “Bird,” Wawashkesh “Deer,” Maang “Loon,” Giigoonh “Fish,” Mko “Bear;” all demonstrate that we humans are related to, that is, are family with, beings who are other than human. That our ancestors shaped our treaties with Britain by inscribing many of those same doodemag on treaty texts indicates that they extended the web of kinship relations to include settlers. We expect that all consultation and discussion with governments and third parties will focus on how the proposed project will foster this relatedness.

(2) Mno-bmaadiziwin: “The good life.” We understand that the Creator placed us within our world’s web of spiritual and bio-physical relationships in order for life to flourish, for all to enjoy the world. Life flourishes when we base our relationships on the gifts of the Seven Grandfathers: Nbwaakaawin “wisdom,” Zaagidiwin “love,” chi “respect,” Aakde’ewin – or Zoongide’ewin “bravery,” Gwakwaadiziwin “honesty,” Dbaadendiziwin “humility,” Debwewin “truth.” We expect that all proposals from and discussions with governments and third parties will demonstrate how the proposed project enhances the good life for all our relations.

(3) Naaknigewin: “Law”. This measure for our decisions and determinations is the gift of the Creator. We expect that all consultation and discussion with governments and third parties will aim to respect and embody law as the measure for our decisions provided by the Creator.

(4) Anishinaabe dbendizawin: “Anishinaabe independence,” or “self-determination.” Some of our elders overcame their repressive years spent within the local residential school, and were able to play crucial roles in entrenching the recognition of our rights into sec. 35(1) of Canada’s Constitution Act, 1982. Their personal struggles have taught us that we were created to live as an independent people, and are therefore able to ally with, but not to become subject to, other independent peoples. Many British treaty negotiators failed to understand this. Canada’s unilateral imposition of regulations on our people, and its presumptuous administration of our lands, stems from its own consistent failure to understand this. Nevertheless, we have seen in some settler leaders, such as Sir William Johnson and his work at Niagara in 1764, the enduring possibility that our peoples might finally create a relationship of equality. William Johnson’s Two Row Wampum embodies this alliance of equals, each party free to follow its own way without interference, but each also attentive to the wellbeing of the other. We expect that all proposals from governments will respect this most basic tenet of the Two Row Wampum.

b. Principles of communication

(1) Zgaswediwin: “To smoke together.” This word combines two sorts of acts into one. When Anishinaabeg met in council, they began with the ceremony of smoking. In our stories, Nanabush provided our ancestors with the pipe of peace in order to help us foster the path of goodwill and reconciliation towards earth, plants, animals, and our fellow humans. Asemaa, “tobacco,” carries our thoughts and prayers to the Creator, and demonstrates our desire to speak the truth, and to build relationships that reflect gratitude in our dependence on the natural order, law, or policing naaknigewin. We expect that all consultation and communication regarding project proposals

reflects the willingness of governments and third parties to place their thoughts and words in the same context.

(2) Ginoondiwin: “talk to each other.” As our elders have said, and as many accounts of Anishinaabe councils have indicated, our practice has been to reach decisions in common, after full and satisfying discussion addressing the concerns of all involved. As Mississauga historian and chief Peter Jones (1802-56) noted in his rendering of a council meeting during the 1850s, the practice of addressing the concerns of all greatly reduced the number of “warm discussions.” We expect federal, provincial and municipal governments to engage with us in consultation that is animated by their need to satisfy our concerns, and not by the needs of third parties, or by deadlines imposed outside of those we might mutually agree to within our processes of consultation. In addition, we expect that when governments attempt to justify project proposals likely to infringe upon our rights and responsibilities, that we will be the party that determines the adequacy of the justification.

(3) Gii-nenmaasiinaawaan: “they didn’t let them”. Anishinaabe participants in treaty talks with settler governments fully expected to be able to consent to or dissent from the proposed matter at hand, as the available written record in Anishinaabemowin makes clear. Our consent to proposals that might affect our rights and responsibilities to our lands, waters and wellbeing is basic to our status as a people possessing dibendizawin, or self- determination. In all matters of consultation and communication, we expect federal, provincial and municipal governments to honour this customary principle of international law, embodied also in article 32(2) of The United Nations Declaration on the Rights of Indigenous Peoples (2007), and finally adopted by Canada in 2016.

(4) Chi-dibaakinigewin: a “great judgement,” as in a treaty between nations. Our ancestors spoke solemnly with settler governments in order to reach agreements that would establish mutually beneficial relationships, which by their nature are on-going, and subject to changing needs and circumstances. However, governments have been one-sided in regard to changing needs in relation to our lands, waters and wellbeing. They have seen our agreements as open, but only as justifying their constant erosion of our control over those lands and waters, and of our wellbeing. We expect that governments interested in consultation will temper this apparently endless desire to consume our lands and waters to the ill effect of our own wellbeing. As well, we expect that when governments insist to the contrary on the legal certainty of treaties and agreements, they will demonstrate persuasively to us how that certainty of the treaty encourages the mutually beneficial relationships that treaties are supposed to establish.

c. Principles of co-existence and economy

(1) Gdoonaaganinaan: “Our Dish,” the agreement reached with the Haudenosaunee in 1701, enabled both our peoples to hunt and harvest in mutual safety, and for mutual wellbeing, within our ancestral lands. We expect federal, provincial and municipal governments to demonstrate clearly and persuasively how proposed projects will undertake to secure mutual safety and mutual wellbeing.

(2) Maatookiiwin: “sharing” Our agreements with settler governments concern our sharing of the lands that the Creator has shared with us. There are no Anishinabemowin transcriptions of treaties that use the word *adaawaage*, meaning “to sell.” Similarly, as Akiwenzii, gimaa of the Lac Courte Orielles Ojibwe, said in relation to the 1837 treaty he co-signed with a US delegation seeking Wisconsin lands: “Gaawiin wiin gimiiisinoon, anishaa ida wi’in,” that is, “I do not make a present of this, I merely lend it to you.” Or, in an 1864 petition to U.S. President Abraham Lincoln, several of those same Anishinaabe chiefs said “Gaawin wiin aki nimbagidinamawaasii,” that is, “I do not offer the land.” We expect that governments interested in projects affecting our lands, waters, and wellbeing will demonstrate how the proposed project embodies this same spirit of sharing of what the Creator has provided, and also charged us with protecting.

(3) Gnawenjigewin: “to take care of things.” Our use of the lands and waters of our territory is subject to Anishinaabe principles of stewardship, derived from our creation story, and instilled through the growth of traditional knowledge. We expect that all communication regarding project proposals will demonstrate how projects plan to incorporate Deshkan Ziiibiing participation in the tasks of co-management and governance, as well as employ conservation practices grounded in and consistent with our traditional knowledge.

(4) Niigaan-inaabiwin: “looking ahead”. Decision making that respects the full web of relationships within which the Creator has placed us aims to chart the impacts of our choices as far as possible into the future, in order to minimize the destructiveness of those choices. We expect that all government decisions and project proposals with potential to affect our lands, waters, air, health and wellbeing will demonstrate as concretely as possible the long-term implications of the proposal for Deshkan Ziiibiing. We expect that they will also concretely demonstrate the steps to be taken to ensure that they will uphold Deshkan Ziiibiing’s responsibilities to protect the web of relationships constituting our traditional territory.

7. Consultation process and requirements

a. Aims of consultation

Appropriate consultation between Deshkan Ziiibiing edbendaagzijig and federal, provincial and municipal authorities serves several purposes. At its heart, appropriate consultation is a dialogue between communities, a mutual engagement, rather than a mere notification of an external party’s intention. Our being fully informed about projects and decisions that may affect our nation protects our full range of rights and responsibilities, as recognized within

traditional Anishinaabe law, in Canada's Constitution, within the jurisprudence of Canada's courts, and in customary international law. It "burnishes the Covenant Chain," by fostering the treaty relationship that should, but does not yet, exist between our people and Canada. In addition to protecting our range of rights, appropriate accommodation also promotes and deepens the path of reconciliation that will ensure a healthier future for both settler and Anishinaabe communities. Appropriate consultation encourages the development of projects that are mutually beneficial to all parties, and it ensures that projects have wide legitimacy both within Deshkan Ziiibiing, and also within the larger network of Anishinaabe nations at home around the Great Lakes.

b. Responsibilities of all parties

(1) All parties engaged in consultation activities have responsibilities in common. Among these are the responsibilities to participate in good faith, and to treat each other with respect, transparency, and honesty. In addition, Deshkan Ziiibiing recognizes that each party has its own unique responsibilities to ensure that the outcome of consultation is a fair, respectful and mutually beneficial understanding of the matter under discussion. Our Anishinaabe understanding of our treaty relationships as the extension of family networks and the attribution of kinship terms encourages us to respect the range of responsibilities borne by parties to consultation.

(2) Crown responsibilities: Deshkan Ziiibiing expects that federal, provincial, and municipal governments will consistently embody the Crown's self-proclaimed obligations towards First Nations. These obligations include a) its fiduciary duties, b) its unyielding motivation to uphold the honour of the Crown, and c) its ongoing commitment to pursue reconciliation with First Nations. Deshkan Ziiibiing edbendaagzijig expect that all inquiries and proposals submitted by the Crown for our consideration, and all government actions undertaken during the course of consultation, are capable of upholding the highest standards of justification on the basis of these three obligations.

Specific Crown responsibilities include timely, effective, and engaged oversight and coordination of all consultation processes and activities involving Deshkan Ziiibiing, and consistent with the honour of the Crown. Competent oversight and coordination requires the Crown to "trigger" the consultation process, that is, as soon as it becomes aware of, or contemplates, activities and proposals that may affect us. Such oversight should include regular updates and dialogues on all consultation processes under way with Deshkan Ziiibiing, and on all Crown determinations of limits to consultation. Oversight also includes due diligence to insure that a project's range, depth, and timeframe of consultation activities are consistent with, and adequate to, Deshkan Ziiibiing's own expressed needs. Crown responsibility also includes timely and adequate provision of funding necessary for Deshkan Ziiibiing to participate in consultation. As well, Crown responsibility includes forthright commitment to the timely and effective accommodation of Deshkan Ziiibiing's full range of rights. In addition, Crown responsibility extends to its earnest incorporation of Deshkan Ziiibiing's partnership into the planning and decision-making process related to the project, as these affect Deshkan Ziiibiing lands, waters, air, health, and wellbeing.

Third party responsibilities: Deshkan Ziiibiing acknowledges that third party entities may be delegated certain procedural aspects of the Crown's duty to consult with us, when they pursue commercial or developmental interests in accessing our lands and waters, or potentially affecting our air, health, and well-being. We expect that third parties are responsible for providing full, accurate, and up-to-date information about their projects. Such information should be provided as it becomes available, and should not be subject to explicit requests from Deshkan Ziiibiing staff. We also expect that that a project proponent seeking to enter into a relationship with us will actively work to accommodate our concerns, and to view its responsibility to accommodate in a positive manner. To that end, we expect that proponents will be conscientious in adjusting their timelines in order to allow for Deshkan Ziiibiing's full participation in any necessary consultation activities. We expect that project proponents will acknowledge their responsibility to consider alternative approaches with us, when implementing their proposal conflicts with our aboriginal and treaty rights, and our ability to protect our lands, waters, air, health, and wellbeing. We expect that proponents will also commit to explore with Deshkan Ziiibiing opportunities to share meaningfully in the range of benefits that might result from implementation of their project.

Should consultation need to proceed past the initial stage, we expect project proponents to provide us with the following written acknowledgements:

- a) a statement fully acknowledging our inherent and treaty rights, and our responsibilities to our territory, as they relate to the project,
- b) a statement indicating that the proponent will share this acknowledgement of our rights and responsibilities in all subsequent communication about the project with shareholders, the public, government departments, lenders, and others,
- c) a statement instructing the proponent's subcontractors that they also function within the same framework of Deshkan Ziiibiing rights and responsibilities,
- d) a statement disclosing all judgments made against the proponent in all jurisdictions, the involvement of all silent partners, and all agreements made with other First Nations, American Indian tribes, and Anishinaabe communities globally, and
- e) a statement acknowledging that work on the project will only follow the full process of consultation and determination of accommodation.

(4) Deshkan Ziiibiing responsibilities: These are, first of all, those that our elders have conveyed from the Creator regarding our obligations to protect the land and waters of our traditional territory. Our responsibilities to our contemporary partners in consultation are similar to those we undertook together with our historic partner in treaty. They include our commitment to uphold the terms of this protocol, as well as of any subsequent agreements arising in regard to consultation and accommodation. We acknowledge the responsibility of staff to provide accurate, sufficient, and timely government or proponent information to Chief and Council, and to Deshkan Ziiibiing edbendaagzijig, in order to ensure that our people engage in full discussion and informed decision making regarding proposed projects. We acknowledge our responsibility to explain to governments and proponents, clearly and fully, any concern, distrust, or discomfort

that we have with a project proposal, to state our rights clearly and forthrightly, and to offer suggestions about how proponents and governments might resolve our concerns in good faith.

c. Contact procedures

(1) All proposals for activities with potential to affect Deshkan Ziibiing lands, waters, air, health, and wellbeing must be submitted to the office of the Chief, at the earliest possible moment in the development of a project idea. Such proposed activities include projects directly impacting Deshkan Ziibiing lands, waters and air, as well as those concerning implementation of, or modifications to, regulations and statutes with potential to affect our lands, waters, air, health, and wellbeing. Upon receipt, proposals will be delegated to the proper Deshkan Ziibiing staff for initial processing.

(2) Submission of proposals describing government or third party projects is necessarily part of the government-to-government relationship conducted between Deshkan Ziibiing and appropriate federal, provincial and municipal authorities. Accordingly, all commercial and industrial proposals with potential to affect Deshkan Ziibiing lands, waters, air, health, and wellbeing must be submitted through the relevant government office. All inquiries and initial proposals should be sent via regular mail to:

Chief
 Deshkan Ziibiing/Chippewas of the Thames First Nation
 320 Chippewa Road
 Muncey, Ontario NOL1Y0
 Canada

Copy to:
 Director Lands and
 Environment
 Deshkan Ziibiing/Chippewas of the Thames First Nation
 77 Anishinaabeg Road
 Muncey, Ontario NOL1Y0
 Canada

(3) All inquiries and initial proposals should contain brief, plain language descriptions of projects, including as necessary:

- a) copies of all project proponent communication with Crown departments regarding the delegation of consultation activities and procedures,
- b) accurate contact information for senior, decision-capable, Crown staff members, as well as for senior level project proponents, when appropriate,
- c) early disclosure of all potential project segmentation or staging scenarios,
- d) precise indications of affected landscape boundaries,
- e) estimated forms of all impacts and risks – including climate change impacts, and all

impacts on biodiversity, air quality, and watershed integrity,

d) explication of potential benefits to Deshkan Ziibiing,

e) preferred timeframes for all aspects of project implementation,

f) estimated time span for effects stemming from life of the project,

g) complete catalogs, with content descriptions, of all relevant studies, mappings, reports, memos, permit applications, motions, and other documents regarding the project proposal,

h) explanation of how the proposal embodies a partner relationship between Deshkan Ziibiing and federal, provincial, and municipal governments,

i) up-to-date measures of corporate social responsibility, such as ISO26000-2010, or B Corp certification.

d. Deshkan Ziibiing processing of inquiries and proposals

1) Designated Deshkan Ziibiing staff will post through regular mail a first response to inquiries and initial proposals, within two weeks of their receipt. First responses will indicate the timeframe necessary for any subsequent Deshkan Ziibiing follow-up to the initial inquiry or proposal, and will include a reasonable target date for beginning subsequent communication.

2) Deshkan Ziibiing determines its participation in consultation on the basis of two variables. First, it assesses projects on a scale of a) *minimal* impact, b) *moderate* impact, and c) *extensive* impact. Examples of minimal impact projects include road repair and resurfacing, and replacement of existing structures. Examples of extensive impact projects include nuclear energy waste storage facilities, alternative energy developments, oil and gas pipelines or facilities, and landfills.

A. Minimal impact consultation

1. Information about a proposed project is received by Chief, and forwarded to the Director of Lands and Environment and the Consultation Coordinator,
2. The Consultation Coordinator screens the proposal, logs details, and scans the entire package into a database,
3. The Consultation Coordinator prepares a response, and forwards it to the appropriate party (government department or third party proponent). Typically, the response indicates that Deshkan Ziibiing has no concerns, and requests continued updates about the proposal, should details change. Consultation service fees apply.

B. Moderate impact consultation

1. Information about a proposed project is received by Chief, and forwarded to the Director of Lands & Environment, and the Consultation Coordinator,
2. The Consultation Coordinator screens the proposal, logs details and scans entire package into database,
3. The Consultation Coordinator adds to the log of projects submitted monthly to the

Environment Committee. Time sensitive responses will be emailed to the Environment Committee, with recommendations and comments for quicker response. The Coordinator prepares a response, and posts it to the appropriate party.

Response 1: Deshkan Ziibiing requests consultation. The appropriate party will be invited to meet with the Lands & Environment department, and may be asked to provide capacity: requests for jobs, job training or a formal request for Capacity Funding Agreement.

Response 2: Deshkan Ziibiing requests additional information in order to determine the extent of concern.

Consultation service fees apply.

C. Extensive impact consultation

1. The process is similar to that of medium impact consultation,
2. With the completion of a necessary Capacity Funding Agreement, and where appropriate, such additional agreements as memoranda of understanding, or community benefit agreements.
3. As well as with the necessary addition of a Deshkan Ziibiing-determined community engagement process, and community ratification.

Second, in addition to the impact scale for required consultation, Deshkan Ziibiing distinguishes between two levels of the scope to consultation. *Landscape level* consultation concerns the evaluation of specific impacts on our lands, waters, air, health, and well-being. *Strategic level* consultation insures more broadly that Deshkan Ziibiing is fully engaged in all federal, provincial and municipal policy formation, planning, implementation, and evaluation, that may affect our traditional territory, immediate homelands, health, and well-being, both at present and in the future.

e. Deshkan Ziibiing-determined provision of required information

Deshkan Ziibiing expects governments and delegated third parties to provide all relevant information, as Deshkan Ziibiing Lands and Environment staff, or Chief and Council might determine is necessary, in order to complete Deshkan Ziibiing's careful evaluation of the impact of the project.

f. Government to government engagement

Although Deshkan Ziibiing may choose to participate in public reviews, studies, and assessments of projects mandated or offered by the Crown to stakeholders in the public sphere, Deshkan Ziibiing is committed to the proposition that it is *not* a stakeholder. The Crown's duty to consult and where necessary accommodate Deshkan Ziibiing requires a separate process on those occasions when we indicate the necessity of consultation. Such consultation, grounded in fiduciary obligations and government willingness to uphold the honour of the Crown, cannot be subsumed.

For those projects and proposals that have a direct impact on Deshkan Ziibiing, we expect that authorities will respect our role and input in providing any necessary terms of reference, or in determining the scope of any necessary review, and in recommending knowledgeable

individuals to serve on reviewing panels and coordinating committees.

Deshkan Ziibiing also expects that its longstanding relationship of alliance with the Crown means that government to government affairs at the minimum must be worked out together in joint dialogue. Accordingly, we expect that the Crown will determine together with us in order to weigh whether it might be appropriate in a given situation to delegate its consultation obligations to a third party.

g. Project-specific work plans

The extent of a project's impact may require us to produce a work plan detailing the steps necessary in order to successfully complete the consultation process. Such a work plan may be developed in conjunction with the relevant government department and the project proponent. Should a work plan need joint development, Deshkan Ziibiing will provide the other consultation parties with a suitable draft, generally within 30 days following our initial contact. Although specific projects may require additional components, in general, plans will include as necessary the following sorts of components:

1. Realistic timeframe,
2. Budget (either cumulative or phase-specific, depending upon the nature of the project),
3. Catalog of information required from each party,
4. List of experts for any necessary review of the project – including legal review, and to undertake any additional studies necessary for Deshkan Ziibiing's informed assessment of the project,
5. List of necessary research projects,
6. Appropriate settings for gathering input from elders,
7. List of proposed meetings between parties, with details of time, place, goals and attendees,
8. Internal consultation steps necessary to incorporate voices of Deshkan Ziibiing edbendaagzijig,
9. Work plan monitoring procedures,
10. Review and evaluation of information,
11. Community decision and notification letter to Crown and proponent,
12. Drafting of any relevant memoranda or agreements.

Work plans may need to be revised as consultation proceeds, and should be done in agreement with all parties. Should government departments and project proponents object to Deshkan Ziibiing's work plan requirements, and only in the aftermath of good faith efforts to reach an

agreement, the parties may turn to a neutral mediator in order to successfully complete an adequate work plan.

h. Elders, traditional knowledge, and confidentiality

As necessary, Deshkan Ziiibiing will indicate the specific ways in which traditional knowledge should inform our assessment of a project proposal's fit within the parameters of the Deshkan Ziiibiing rights and responsibilities laid out above. To that end, staff will develop provisions for insuring that elders play an appropriate role in assessing the project.

Given that much traditional knowledge refers to matters that are sensitive to members of families, or that might only be transmittable within appropriate relational contexts between individuals, we expect that government departments and project proponents will fully respect our judicious determinations of confidentiality, in regards to the gathering of information from elders and other recognized knowledge keepers.

i. Processes for Deshkan Ziiibiing internal consultation

Deshkan Ziiibiing's practice of governance reflects a long history of community-based decision making, one preceding the development of democratic governments by centuries. Depending upon the matter for consultation, government departments and project proponents will need to embrace our approach to internal consultation, and be willing to work with the processes necessary for Deshkan Ziiibiing edbendaagzijig to determine their level of trust and support for the project.

j. Conditions for providing consent

Decisions regarding a project may be achieved in two ways. Those projects seen to have little impact on Deshkan Ziiibiing lands, air, waters, health and wellbeing may be evaluated completely through the efforts of administrative staff, select committees of council, or of council and chief.

Those projects with significant potential to impact Deshkan Ziiibiing lands, air, waters, health and wellbeing, will require the scrutiny of the community as whole. Our traditions of governance charge our leaders with gathering and articulating the voices of the community as a whole. Thus, projects raising significant concerns for Deshkan Ziiibiing edbendaagzijig will need to be accepted by the community in order for Chief and Council to speak in favour of them.

k. Ongoing needs for consultation

Deshkan Ziiibiing expects that consultation on specific matters will likely vary in terms of its duration. Consultation partners may not need to continue discussion past a particular point in the life of a project. However, we expect to be able to determine when we need to continue consultation throughout the life of a project, or even afterwards – for instance, if decommissioning or cumulative effects raise continuing or additional concerns regarding our lands, air, waters, health and wellbeing.

Government or proponent changes to a project, such as its timeline, design, or implementation,

are not unilateral matters. We expect that we will continue the consultation relationship through such reconfigurations.

As well, consultation may need to continue in conjunction with the development of any co-management procedures.

8. Capacity requirements:

Project proponents may see their specific enterprises as unique and urgent efforts. For Deshkan Ziibiing, however, the reality is that our administrative offices receive many proposals, notifications, overviews, and pressing correspondence, on a daily basis. The office of Treaty, Lands and Environment is quite small, with staff workloads consistently focused on a variety of pressing tasks. Unlike other departments of Deshkan Ziibiing governance, Treaty, Lands and Environment's work is self-funded. Consequently, Deshkan Ziibiing requires a range of capacity funding in order to ensure that proposals are adequately, efficiently, and fairly considered within the consultation process.

a. Consultation Service Fees

A complete breakdown of consultation service fees for the varying levels of project impact is attached (refer to Appendix D).

The extent of any ongoing processing fees will depend upon the nature of the investment of time and staff necessary for Deshkan Ziibiing to reach an informed and thorough assessment of the project's implications for our lands, waters, air, health, and wellbeing. We would expect to determine these fees, when significant, in conjunction with government administrators and project proponents. We would also expect that such determination would focus on the matter of insuring Deshkan Ziibiing's ability to fully engage in the consultation matter at hand.

b. Deshkan Ziibiing's participation in research

Depending upon the nature of the project, Deshkan Ziibiing may find that its ability to make a full and informed decision about the proposed project's fit within the framework of principles outlined above requires the conduct of additional research. To the extent that proponents and government departments directly engage in research related to Deshkan Ziibiing, we expect that we will be involved in determining the purpose and scope of the research, the participants in the research, and their roles, and the extent to which the research will involve the work of Deshkan Ziibiing community members, and/or staff. Study methods may include but are not limited to:

- Agricultural Assessment
- Air Quality Assessment
- Cultural Heritage Assessment
- Archeology Assessment
- Ecology Assessment
- Groundwater/Surface Water Assessment
- Land Use Planning Forecast Assessment
- Noise/Vibration Assessment
- Social Assessment
- Traffic Assessment

- Visual/Landscape Assessment

We expect that any resulting staffing needs will be appropriately met by agreement with the Crown and the proponent.

c. Deshkan Ziibiing-initiated research

In addition to research organized in service of the proponent's project, it may also be necessary for Deshkan Ziibiing to initiate its own research projects in order to reach a successful determination about the project. Examples of such research needs include questions about the cumulative effects of a project; or assessments of cultural and archeological, biodiversity, endangered species habitat, or water quality impacts; or traditional land use and occupancy studies where the project is not suited to assessing in the light of existing studies; or competent and thorough assessments of the extent of community support, when a project appears to be especially contentious. We expect that the capacity to engage in such research will be supported by agreement with the Crown and the proponent.

d. Travel and/or hosting expenses

Depending upon the project, it may be necessary for staff, elders, or others, to travel to a project site, or to host meetings or gatherings with those who have historical knowledge and family memories significant to collect, in order to increase Deshkan Ziibiing's ability to provide a thorough assessment of a project. We expect that governments and proponents will bear these costs.

e. Honoraria for elders

Our long-standing practice is to acknowledge our dependence upon the wisdom and knowledge of our elders, a dependence that extends to those outside our community who also wish to draw upon their wisdom and knowledge. Such acknowledgment is appropriately made in terms of money and gifts. We expect governments and proponents to provide these costs, which can be determined in conjunction with staff.

f. Distribution of print materials

Depending upon the nature of the project, staff may need to circulate significant amounts of print materials to Deshkan Ziibiing edbendaagzijig. We expect governments and proponents to provide these costs, as well.

9. Accommodation, mitigation, and compensation plans

Projects with potential to affect our lands, waters, health, and wellbeing cannot proceed without our determining in advance with governments and proponents exactly how they intend to mitigate any impacts, accommodate the depth and extent of our concerns, and compensate any envisioned losses or harms to our lands, waters, air, health and wellbeing. In general, the protection of our inherent and treaty rights, and the respect for our obligations to preserve the lands and waters of Deshkan Ziibiing, are matters to resolve prior to any discussion of potential benefits that might be created through implementation of the project.

The following are non-exhaustive examples of provisions and separate instruments to work out, as necessary, in the process of consultation, in order for Deshkan Ziibiing edbendaagzijig to

embrace the legitimacy of a project:

1. conclusion of any resulting memoranda of understanding, terms of reference, or impact benefit agreements
2. formation of equity and partnership agreements
3. configuration of rents and royalties
4. determination of the extent and composition of intellectual property
5. securing of training, employment, and education opportunities for Deshkan Ziibiing edbendaagzijig within the lifespan of the project
6. development of any necessary co-management structure
7. evidence of serious incorporation of Deshkan Ziibiing concerns into the drafting and subsequent ratification or authorization of all legislation and regulations affecting our lands, air, waters, health and wellbeing

Deshkan Ziibiing expects that the Crown in fulfillment of its fiduciary duty and its diligent regard to uphold the honour of Crown, will assist as, and only as, we may request it to, in undertaking all aspects of negotiation or discussion regarding any agreement that we might reach with a project proponent.

In addition, we expect that all agreements regarding matters of accommodation, mitigation, and compensation are in place before work on a project begins, or if such work actually began prior to our learning of the project from the relevant government department, before the work continues any further.

10. Dispute resolution mechanisms

In the event that governments and third parties are not content with Deshkan Ziibiing's determinations regarding the requirements necessary for our assessing a project, or regarding our conclusion that a particular project does not fit within the framework of rights, responsibilities, and principles elaborated above, we acknowledge that all parties reserve the right to engage in various means of dispute resolution.

- a. Deshkan Ziibiing expects that its expressed and timely intention to pursue dispute resolution will be sufficient for the other parties to place a hold on project development until the dispute is resolved.
- b. Given our historic commitment to resolving disagreements without "warm discussion", the first step in resolving disputes must be honest, good faith discussion in which the Deshkan Ziibiing and the Crown acknowledge that they each have equal decision-making power with the other.
- c. Should agreement between representatives of the parties be unreachable, continuing discussion should take place between such senior-level

decision-makers as Chief, Ministers, deputy ministers, and executives.

- d. Should these discussions fail to yield agreement, the parties may call in the services of a neutral mediator, whose costs will be borne by agreement with the Crown and the proponent.
- e. If the dispute between Deshkan Ziibiing and the other parties is a matter of scientific, technical, historical, archeological, or other such knowledge, the parties may rely upon an assessment from a panel of experts, chosen in equal number by the parties, and whose expenses will be provided by agreement with the Crown and the proponent.
- f. Termination of any agreements or processes prior to completion of consultation should be subject to what the Supreme Court has referred to as “the duty of good faith and honest performance” (Bhasin v. Hrynew, 2014).
- g. Deshkan Ziibiing reserves all right to pursue such adjudication as may seem to it necessary, whether within Canada’s courts, or before international bodies, such as the Inter-American Court of Human Rights.

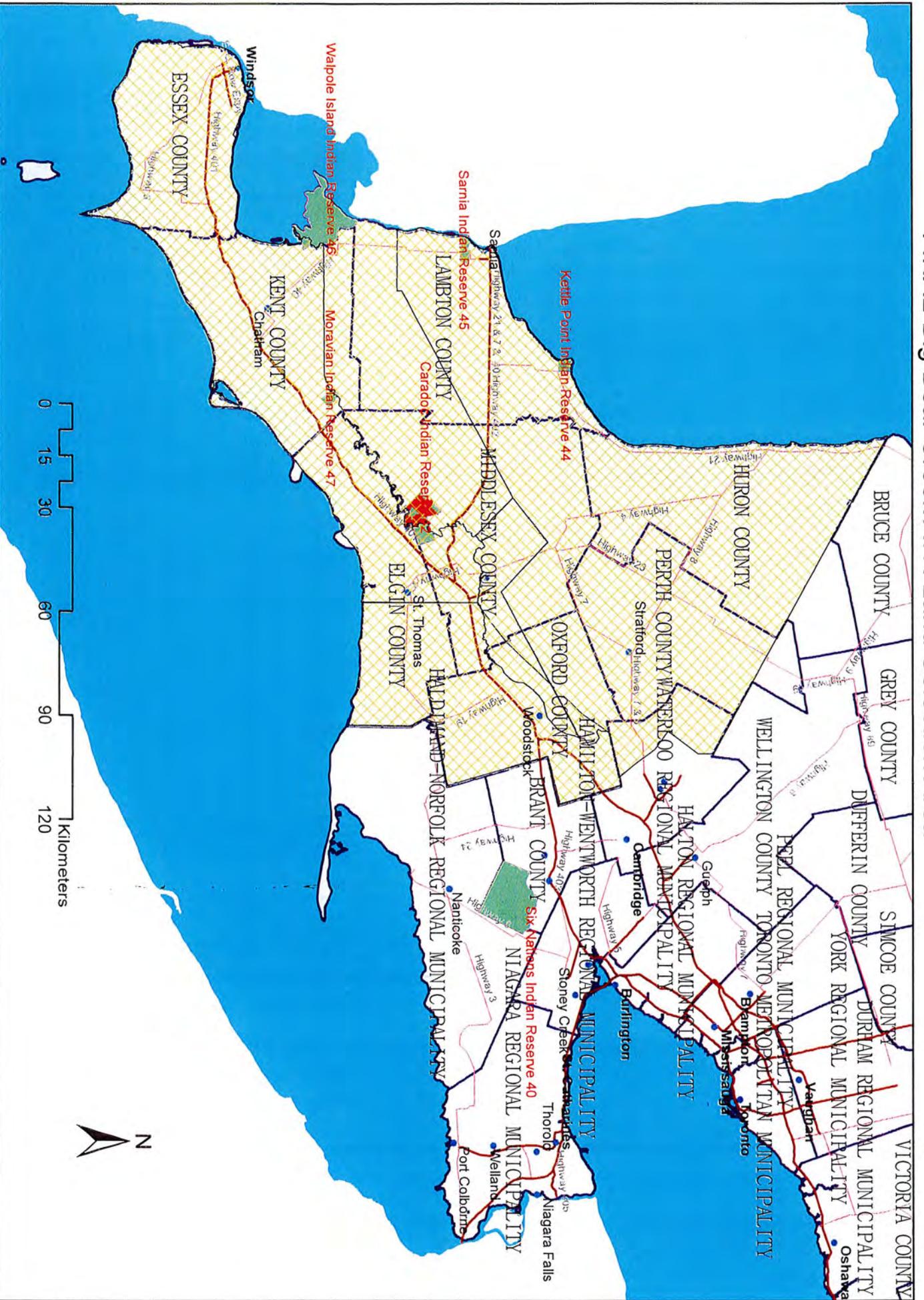
11. Appendices

- A. COTTFN Consultation Map
- B. Southwestern Ontario Treaty Map
- C. Consultation Flow Chart
- D. Consultation Service Fees

This protocol is subject to revision and further development, determinable by Chief and Council, and reflecting as needed the consent of Deshkan Ziibiing edbendaagzijig.

For use with permission of Deshkan Ziibiing/Chippewas of the Thames.

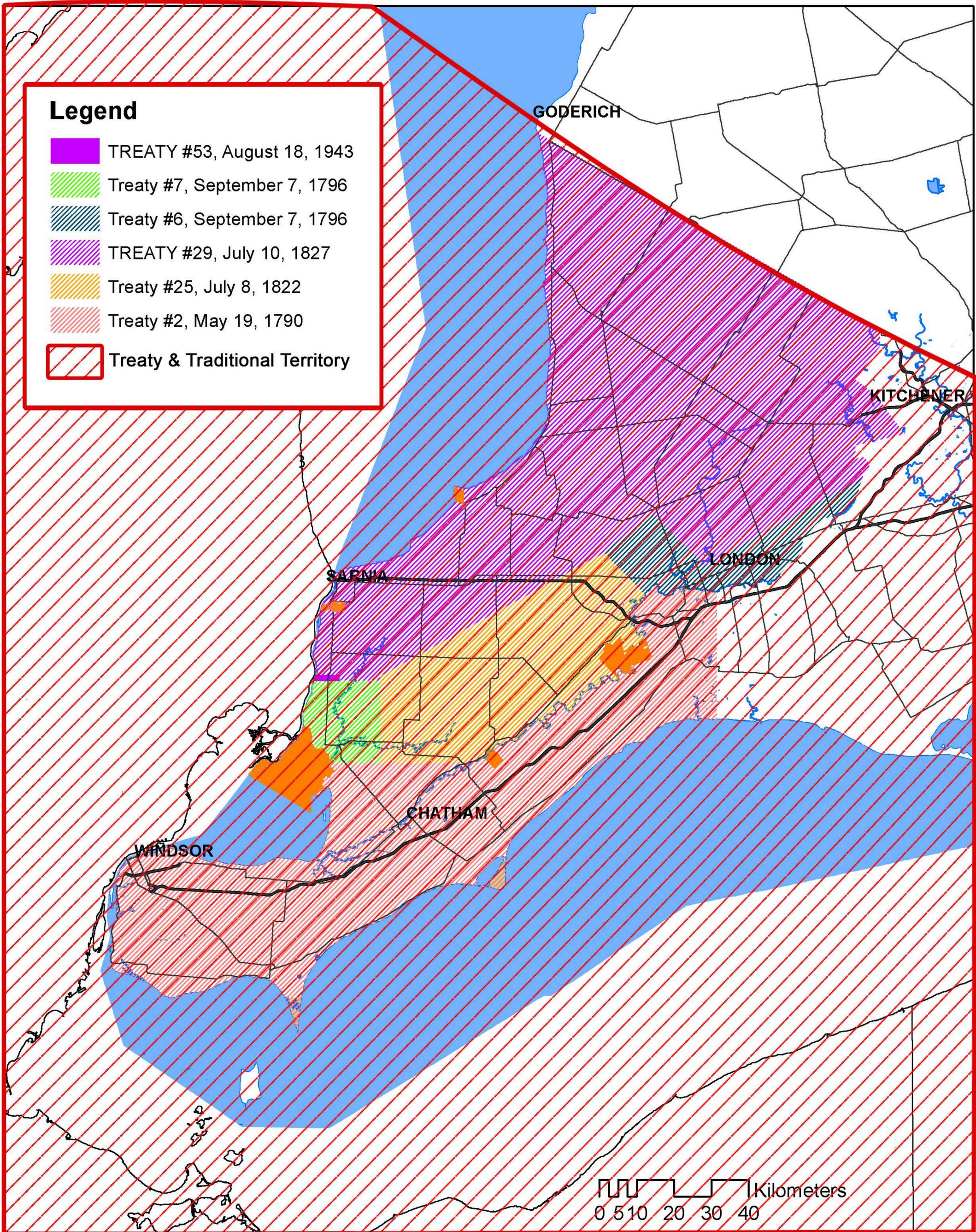
FINAL-Big Bear Creek ATR Land Selection Area



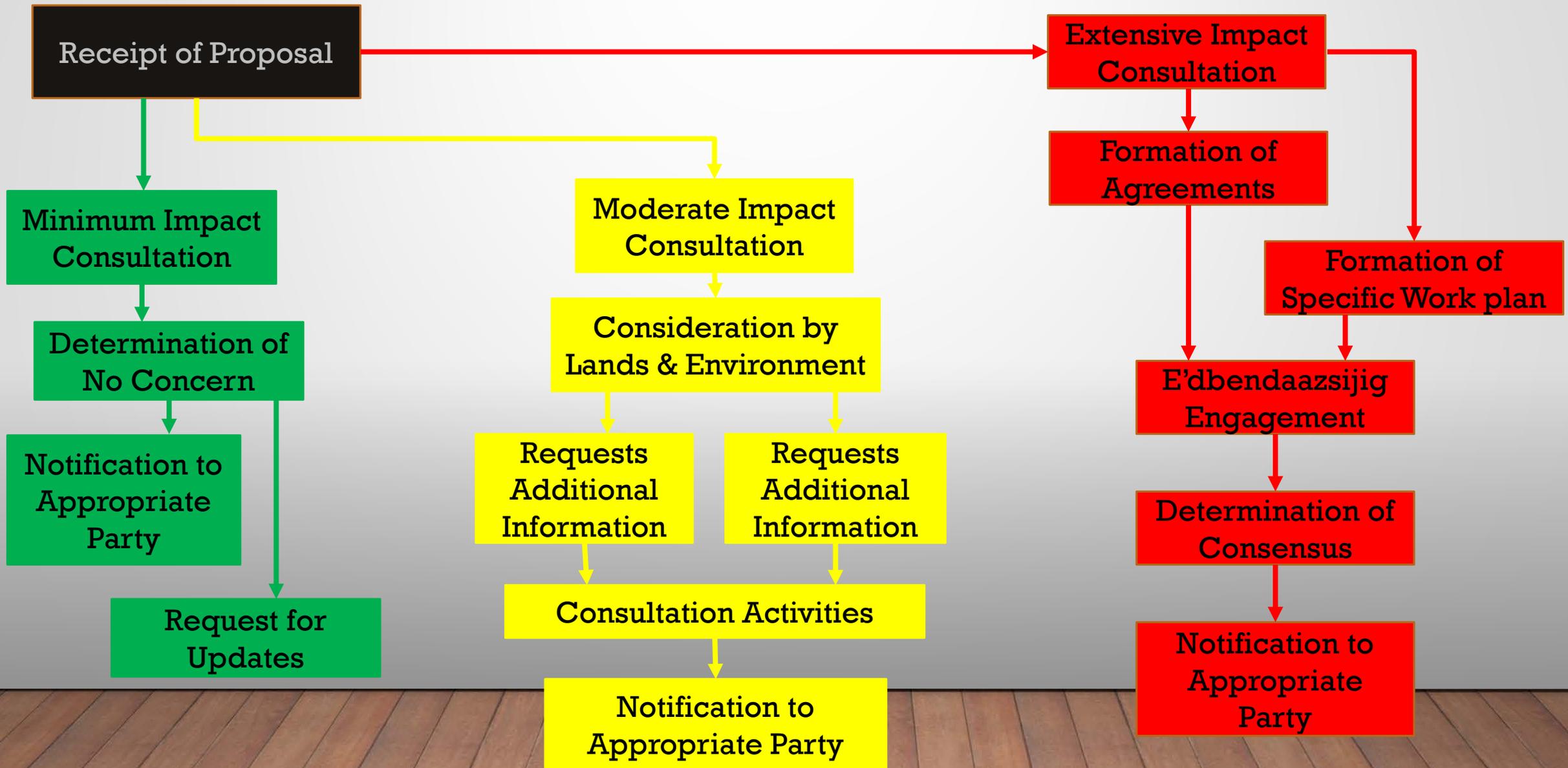
SOUTHERN FIRST NATION TREATY TERRITORY

Legend

- TREASY #53, August 18, 1943
- Treaty #7, September 7, 1796
- Treaty #6, September 7, 1796
- TREASY #29, July 10, 1827
- Treaty #25, July 8, 1822
- Treaty #2, May 19, 1790
- Treaty & Traditional Territory



Deshkan Ziibiing Consultation Flow Chart





TREATY, LANDS & ENVIRONMENT

Capacity Delivery Overview

CONSULTATION AND ACCOMMODATION

Chippewas of the Thames First Nation (COTTFN) has developed a general framework for the First Nation in all aspects of its treaty, lands and environmental issues.¹

Under this framework, the First Nation is able to provide a response to all incoming correspondence from project proponents under the *Duty to Consult* and Engagement. COTTFN uses an internal process for ranking and identifying both risks and opportunities when project information is received; and incorporates both environmental and *Haida*-spectrum analysis for the First Nation.

COST RECOVERY

As part of Chippewas of the Thames First Nation Administration the Treaties, Lands & Environment department is responsible for carrying out the environmental and land-related priorities of the nation. Our responsibilities extend to the Traditional Territory of our ancestors; the lands that were agreed to be shared through the Treaties between 1790 and 1822; and the lands that our ancestors chose to be reserved for us and future generations.

Our department is primarily funded through own-source revenues, reflecting a prioritization of lands and the environment based not only on our inherent responsibilities, but also influenced by a vision for the future. This vision utilizes both Traditional Knowledge and other environmental sciences.

Relatively recent developments in Canadian Law and policy, specifically the Duty to Consult, has introduced a dramatic increase in activity for our department. When we engage with a project proponent, it is important that the time and effort involved in receiving correspondence and identifying appropriate response levels is not to be underestimated.

COTTFN has developed three levels of response. These are based on the impacts the project may have on our Aboriginal and Treaty Rights. These levels are also based on factors that the COTTFN has identified in accordance with the responsibilities given to us by the Creator, and our responsibilities to future generations.

The following fee schedule reflects estimated compensation for time and resources that our office requires to actively engage with proponents for the Duty to Consult. These estimates do not include additional costs, such as Honorarium for Elders, Legal Fees, Hosting Fees, fees associated with study participation, i.e. Archaeology, Natural Heritage, Ecology, etc. (this is not an exhaustive list)

When such costs arise, they will be communicated prior to billing.

Colour Coded Ranking of Projects

Definition	Colour
Level 1: Minimal Impact	Costs Associated - Standard
Level 2: Moderate Impact	Costs Associated - Standard
Level 3: Extensive Impact	Costs Associated - Standard

LEVEL 1-ENGAGEMENT

ENGAGEMENT, CONSULTATION AND ACCOMMODATION					
Level 1					
Project					
Minimal					
Director	Activity	Daily	Hourly	Units Estimated	Projected Cost
	Review, high level response and issuing correspondence; and providing direction to staff on the First Nation response based on broad First Nation concerns.	\$ 550.00			NA
Senior Environment Officer	Activity	Daily	Hourly	Units Estimated	
	Environmental review for impacts to traditional territory and based on First Nation concerns, such as, but not limited to: noise, air, waste, contaminants, discharges, greenhouse gases, permitting required, cumulative effects. Development of Recommendations and support to the COTTFN Environment Committee.		\$ 85.00	4	\$ 340.00
Consultation Coordinator	Activity	Daily	Hourly	Units Estimated	
	Receipt of Information, Risk Identification, Internal Notification of Projects, Entry into Database, Issuing Correspondence, Maintenance of filing system, Library Services. Report production for the COTTFN Environment Committee and administrative support.		\$ 85.00	4	\$ 340.00
Treaty Research	Activity	Daily	Hourly	Units Estimated	
	Identification of project in relation to traditional territory, treaty areas, unceded areas, historical occupation	\$ 450.00			NA
COTTFN Environmental Committee	Activity	Daily	Hourly	Units Estimated	
	Reviews projects that have been submitted by the Treaty, Lands and Environment Department and approves recommendations by staff; and/or provides further direction on the project.	\$ 250.00		1	\$ 250.00
Filing Fee	fee charged to accept a document for processing and filing retention				\$ 125.00
TRAVEL	For proponents' meetings, workshops, open houses, public meetings.			0.525 / km	TBD
				SUB-TOTAL	\$ 1055.00
ADMINISTRATION CHARGE 15%	Central Mail, Financial Services: payroll, reimbursement procedures, accounts payable and receivable, production of financial statements, year-end audit. Photocopying, phone and internet service.			15%	\$ 158.25
				GRAND TOTAL:	\$ 1,213.25

****These prices are effective as of November 2018**

**** Prices subject to change, without notice**

LEVEL 2-CONSULTATION

ENGAGEMENT, CONSULTATION AND ACCOMMODATION					
Level 2					
Project					
Moderate					
Director	Activity	Daily	Hourly	Units Estimated	Projected Cost
	Review, high level response and issuing correspondence; and providing direction to staff on the First Nation response based on broad first Nation concerns.	\$ 550.00		1	\$ 550.00
Senior Environment Officer	Activity	Daily	Hourly	Units Estimated	
	Environmental review for impacts to traditional territory and based on First Nation concerns, such as, but not limited to: noise, air, waste, contaminants, discharges, greenhouse gases, permitting required, cumulative effects. Development of Recommendations and support to the COTTFN Environment Committee.		\$ 85.00	6	\$ 510.00
Consultation Coordinator	Activity	Daily	Hourly	Units Estimated	
	Receipt of Information, Risk Identification, Internal Notification of Projects, Entry into Database, Issuing Correspondence, Maintenance of filing system, Library Services. Report production for the COTTFN Environment Committee and administrative support.		\$ 85.00	8	\$ 680.00
Events & Promotions Coordinator	Activity	Daily	Hourly	Units Estimated	
	Development of internal community consultation communication website and social media update, and event planning		\$ 65.00	5	\$ 325.00
Treaty Research	Activity	Daily	Hourly	Units Estimated	
	Identification of project in relation to traditional territory, treaty areas, unceded areas, historical occupation.	\$ 450.00		1	\$ 450.00
COTTFN Environmental Committee	Activity	Daily	Hourly	Units Estimated	
	Reviews projects that have been submitted by the Treaty, Lands and Environment Department and approves recommendations by staff; and/or provides further direction on the project.	\$ 250.00		2	\$ 500.00
COTTFN Band Council	Activity	Daily	Hourly	Units Estimated	Projected Cost
	Reviews projects, deliberates, and provides overall direction to Treaty, Lands & Environment	\$ 350.00		2	\$ 700.00
COTTFN Development Corporation	Activity	Daily	Hourly	Units Estimated	
	The Development Corporation will be responsible for conducting the due diligence required to assess project feasibility, risk and benefit to the community. The information gathered will be presented to the Corporation's Board of Directors to determine the level of contribution and any future involvement based on economic viability and community consensus.	\$ 300.00		1	\$ 300.00
Filing Fee	Fee charged to accept a document for processing and filing retention				\$ 125.00
TRAVEL	For proponents' meetings, workshops, open houses, public meetings.			0.525 / km	TBD
SUB-TOTAL					\$ 4,140.00
ADMINISTRATION CHARGE 15%	Central Mail, Financial Services: payroll, reimbursement procedures, accounts payable and receivable, production of financial statements, year- end audit. Photocopying, phone and internet service.			15%	\$ 621.00
GRAND TOTAL:					\$ 4,761.00

**These prices are effective as of December 2018

** Prices subject to change, without notice

LEVEL 3- HIGH RIGHTS/HIGH IMPACTS

ENGAGEMENT, CONSULTATION AND ACCOMMODATION					
Level 3					
Negotiations and/or					
Extensive Impact					
Director	Activity	Daily	Hourly	Units Estimated	Projected Cost
	High level response and issuing correspondence; and providing direction to staff on the First Nation response based on broad first Nation concerns.	\$ 550.00		2	\$1,100.00
Senior Environment Officer	Activity	Daily	Hourly	Units Estimated	
	Environmental review for impacts to traditional territory and based on First Nation concerns, such as, but not limited to: noise, air, waste, contaminants, discharges, greenhouse gases, permitting required, cumulative effects. Development of Recommendations and support to the COTTFN Environment Committee.		\$ 85.00	6	\$ 510.00
Consultation Coordinator	Activity	Daily	Hourly	Units Estimated	
	Receipt of Information, Risk Identification, Internal Notification of Projects, Entry into Database, Issuing Correspondence, Maintenance of filing system, Library Services. Report production for the COTTFN Environment Committee and administrative support.		\$ 85.00	10	\$ 850.00
Events & Promotions Coordinator	Activity	Daily	Hourly	Units Estimated	
	Development of internal community consultation communication website and social media update, and event planning		\$ 65.00	5	\$ 325.00
Treaty Research	Activity	Daily	Hourly	Units Estimated	
	Identification of project in relation to traditional territory, treaty areas, unceded areas, historical occupation	\$ 450.00		1	\$ 450.00
COTTFN Environmental Committee	Activity	Daily	Hourly	Units Estimated	
	Reviews projects that have been submitted by the Treaty, Lands and Environment Department and approves recommendations by staff; and/or provides further direction on the project.	\$ 250.00		3	\$ 750.00
COTTFN Band Council	Activity	Daily	Hourly	Units Estimated	Projected Cost
	Reviews projects, deliberates, and provides overall direction to Treaty, Lands & Environment	\$ 350.00		2	\$ 700.00
COTTFN Development Corporation	Activity	Daily	Hourly	Units Estimated	
	The Development Corporation will be responsible for conducting the due diligence required to assess project feasibility, risk and benefit to the community. The information gathered will be presented to the Corporation's Board of Directors to determine the level of contribution and any future involvement based on economic viability and community consensus.	\$ 300.00		2	\$ 600.00
Filing Fee	Fee charged to accept a document for processing and filing retention				\$ 125.00
TRAVEL	For proponents' meetings, workshops, open houses, public meetings.			0.525 / km	TBD
				SUB-TOTAL	\$ 5, 410.00
ADMINISTRATION CHARGE	Central Mail, Financial Services: payroll, reimbursement procedures, accounts payable and receivable, production of financial statements, year-end audit. Photocopying, phone and internet service.			15%	\$ 811.50
				GRAND TOTAL:	\$ 6, 221.50

***These prices are effective as of December 2018

** Prices subject to change, without notice

From: [Micks, Sarah](#)
To: chief.plain@aamjiwnaang.ca; cobrien@aamjiwnaang.ca
Cc: [Peter Marra](#); [Jonathan Osborne](#); [Brown, Steve \(Waterloo\)](#)
Subject: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA
Date: Tuesday, June 6, 2023 11:33:00 AM
Attachments: [ad_lasalle_fnl_20230605.pdf](#)

Hello,

Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town's website, www.lasalle.ca/studies starting June 20.

The PIC will present the improvements for the Stage 2 catchment area. An overview of the study, alternative solutions, evaluation criteria, preliminary preferred alternative and next steps will be included in the presentation.

Please contact a member of the project team identified on the attached Notice if you have any questions, comments or concerns.

Thank you,

Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

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From: [Micks, Sarah](#)
To: denise.stonefish@delawarenation.on.ca
Cc: [Peter Marra](#); [Jonathan Osborne](#); [Brown, Steve \(Waterloo\)](#)
Subject: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA
Date: Tuesday, June 6, 2023 11:31:00 AM
Attachments: [ad_lasalle_fnl_20230605.pdf](#)

Hello,

Please find the attached combined Notice of Study Commencement and Notice of Public Information Centre (PIC) #1 for the Town of LaSalle, Stage 2 Detroit River Storm Sewer Outfalls Master Plan and Environmental Assessment Study. PIC #1 is being held in-person at the Town of LaSalle Town Hall (5950 Malden Road, LaSalle, ON) on Tuesday, June 20, 2023 from 4:00-7:00pm. The PIC will also be available online on the Town's website, www.lasalle.ca/studies starting June 20.

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From: [Micks, Sarah](#)
To: "jason.henry@kettlepoint.org"
Cc: [Peter Marra](#); [Jonathan Osborne](#); [Brown, Steve \(Waterloo\)](#)
Subject: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA
Date: Tuesday, June 6, 2023 11:33:00 AM
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From: [Micks, Sarah](#)
To: [Consultations](#)
Cc: [Peter Marra](#); [Jonathan Osborne](#); [Brown, Steve \(Waterloo\)](#)
Subject: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA
Date: Tuesday, June 6, 2023 11:29:00 AM
Attachments: [ad_lasalle_fnl_20230605.pdf](#)

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Thank you,

Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

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From: [Micks, Sarah](#)
To: chief.peters@munsee.ca; carol@munsee.ca; consultation@munsee.ca; carol@munsee.ca
Cc: [Peter Marra](#); [Jonathan Osborne](#); [Brown, Steve \(Waterloo\)](#)
Subject: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA
Date: Tuesday, June 6, 2023 11:31:00 AM
Attachments: [ad_lasalle_fnl_20230605.pdf](#)

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Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

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Please consider the environment before printing this email.

From: [Micks, Sarah](#)
To: charles.sampson@wifn.org; janet.macbeth@wifn.org; dean.jacobs@wifn.org
Cc: [Peter Marra](#); [Jonathan Osborne](#); [Brown, Steve \(Waterloo\)](#)
Subject: Notice of Study Commencement & PIC 1 - Town of LaSalle, Stage 2 SWMP, MCEA
Date: Tuesday, June 6, 2023 11:32:00 AM
Attachments: [ad_lasalle_fnl_20230605.pdf](#)

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Thank you,

Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

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Please consider the environment before printing this email.

From: [Micks, Sarah](#)
To: [Cathleen O'Brien](#)
Cc: [Courtney Jackson](#)
Subject: RE: [EXTERNAL] Town of LaSalle, Stage 2 Stormwater Master Plan, Approach #2 MCEA - Upcoming Master Plan Report
Date: Friday, February 23, 2024 3:00:00 PM

Hi Cathleen,

Thank you for your response. Should you have any questions, comments, or concerns, please don't hesitate to contact a member of the project team.

Have a great weekend!

Sarah Micks

Environmental Planner
sarah.micks@stantec.com
Direct: 519-432-4292
400-1305 Riverbend Road
London, ON N6K 0J5



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Please consider the environment before printing this email.

From: Cathleen O'Brien <cobrien@aamjiwnaang.ca>
Sent: Friday, February 23, 2024 12:55 PM
To: Micks, Sarah <Sarah.Micks@stantec.com>
Cc: Courtney Jackson <cjackson@aamjiwnaang.ca>
Subject: RE: [EXTERNAL] Town of LaSalle, Stage 2 Stormwater Master Plan, Approach #2 MCEA - Upcoming Master Plan Report

You don't often get email from cobrien@aamjiwnaang.ca. [Learn why this is important](#)

Hi there,

Thanks for the email. I've copied our consultation worker, Courtney on this and we'll take a look and get back to you.

Thanks,
Cathleen

From: Micks, Sarah <Sarah.Micks@stantec.com>
Sent: Thursday, February 22, 2024 4:07 PM
To: Chris Plain <chief.plain@aamjiwnaang.ca>; Cathleen O'Brien <cobrien@aamjiwnaang.ca>
Cc: Jonathan Osborne <josborne@lasalle.ca>; Michael Cappucci <mcappucci@lasalle.ca>; Brown, Steve (Waterloo) <steve.brown@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>

Subject: [EXTERNAL] Town of LaSalle, Stage 2 Stormwater Master Plan, Approach #2 MCEA - Upcoming Master Plan Report

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Good Afternoon,

As you are aware, the Town of LaSalle is completing an Approach #2 Master Plan, Municipal Class Environmental Assessment to assess the stormwater infrastructure draining directly or indirectly into the Detroit River. A Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from effects of stormwater flooding while also protecting the natural environment.

The Town is preparing the Stage 2 SWMP Master Plan report. Prior to issuing the report for 30-day public review, the Town would like to extend the opportunity to discuss any questions or concerns you may have with the study.

If you have any questions, or would like to meet with the project team, please contact Jonathan Osborne, Director of Public Works with the Town of LaSalle, at josborne@lasalle.ca, or by phone at 519-969-7770 ext. 1255.

Thank you,

Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

400-1305 Riverbend Road

London, ON N6K 0J5



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Stantec Consulting Ltd.
400-1305 Riverbend Road
London ON N6K 0J5

February 22, 2024

Project/File: 161414064

Attention: Chief Chris Plain

Aamjiwnaang First Nation
978 Tashmoo Avenue
Sarnia, ON N7T 7H5

Hello Chief Plain,

**Reference: Town of LaSalle – Notice of Upcoming Stage 2 Stormwater Master Plan Report,
Municipal Class Environmental Assessment**

As you are aware, the Town of LaSalle is completing an Approach #2 Master Plan, Municipal Class Environmental Assessment to assess the stormwater infrastructure draining directly or indirectly into the Detroit River. A Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from effects of stormwater flooding while also protecting the natural environment.

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Recommendations for the Stage 2 SWMP have been identified. The project team is recommending Private Drainage Solutions for property owners to consider, to reduce flood risk on their private property. These recommendations include the following:

- Maintaining private drainage systems
- Adding storage capacity
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- Downspout disconnection

The improvements recommended in this Stage 2 SWMP will be completed on private property to private drainage systems. As a result, the improvements are exempt from the Class EA process.

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Thank you for your interest in this study. We look forward to hearing from you.

From: [Micks, Sarah](#)
To: chiefmaryduckworth@caldwellfirstnation.ca
Cc: [Michelle McCormack](#); [Zack Hamm](#)
Subject: FW: Town of LaSalle, Stage 2 Stormwater Master Plan, Approach #2 MCEA - Upcoming Master Plan Report
Date: Thursday, February 22, 2024 4:00:00 PM
Attachments: [let_1614_CaldwellFirstNation-UpcomingMP_20240220.pdf](#)

Hello Chief Duckworth,

My apologies - please see the correspondence below, initially sent to the incorrect email address (an error/typo adding an 's' to the end of your email).

Regards,

Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

400-1305 Riverbend Road

London, ON N6K 0J5



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From: Micks, Sarah
Sent: Thursday, February 22, 2024 3:58 PM
To: chiefmaryduckworth@caldwellfirstnations.ca;
Cc: Jonathan Osborne <josborne@lasalle.ca>; Michael Cappucci <mcappucci@lasalle.ca>; Brown, Steve (Waterloo) <steve.brown@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: Town of LaSalle, Stage 2 Stormwater Master Plan, Approach #2 MCEA - Upcoming Master Plan Report

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The Town is preparing the Stage 2 SWMP Master Plan report. Prior to issuing the report for 30-day public review, the Town would like to extend the opportunity to discuss any questions or concerns you may have with the study.

Please find the attached letter correspondence, which has also been uploaded to the www.consultwithcaldwell.ca website under the Project File for this study.

If you have any questions, or would like to meet with the project team, please contact Jonathan Osborne, Director of Public Works with the Town of LaSalle, at josborne@lasalle.ca, or by phone at 519-969-7770 ext. 1255.



Stantec Consulting Ltd.
400-1305 Riverbend Road
London ON N6K 0J5

February 22, 2024

Project/File: 161414064

Attention: Chief Mark Duckworth

Caldwell First Nation
14 Orange Street
Leamington, ON N8H 1P5

Hello Chief Duckworth,

**Reference: Town of LaSalle – Notice of Upcoming Stage 2 Stormwater Master Plan Report,
Municipal Class Environmental Assessment**

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Thank you for your interest in this study. We look forward to hearing from you.

Best regards,

STANTEC CONSULTING LTD.



Sarah Micks
Environmental Planner
Phone: 519-432-4292
sarah.micks@stantec.com

Attachment: Figure 1: Study Area Map

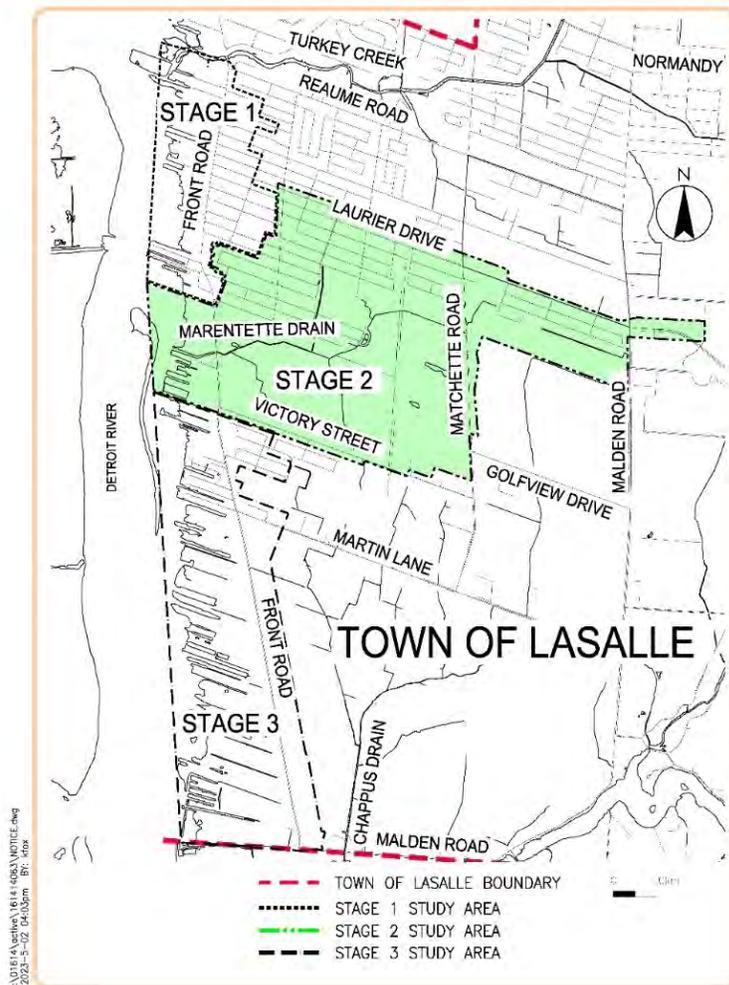


Figure 1: Study Area Map

From: [Jonathan Osborne](#)
To: [Erna-Marie Leclair](#)
Cc: [Micks, Sarah](#)
Subject: RE: La Salle Stage 2 Detroit River Storm Sewer Outfalls Master Plan
Date: Thursday, April 4, 2024 1:53:06 PM
Attachments: [image002.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)
[image003.png](#)
[Chippewas of the Thames First Nation Response Letter_apr 4 2024.pdf](#)

Hi Erna-Marie,

Thank you for providing your comments on our EA for this storm master plan. Please see attached letter in response to your comments/concerns regarding the Stage 2 Detroit River Storm Sewer Outfalls Master Plan. If you have any questions please feel free to reach out and we can discuss.

Thanks,

Jonathan Osborne, P.Eng.

Director of Public Works
Town of LaSalle



5950 Malden Road, LaSalle, Ontario N9H 1S4
Phone: 519-969-4143 ext. 1255 Fax: 519-969-9852
Email: josborne@lasalle.ca
www.lasalle.ca

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From: Erna-Marie Leclair <emleclair@cottfn.com>
Sent: Wednesday, March 13, 2024 3:20 PM
To: Jonathan Osborne <josborne@lasalle.ca>
Subject: La Salle Stage 2 Detroit River Storm Sewer Outfalls Master Plan

You don't often get email from emleclair@cottfn.com. [Learn why this is important](#)

Hello Jonathan,

COTTFNs Consultation Unit has received notification of the upcoming Stage 2 Storm Water Master Plan Report. It was indicated that it would be beneficial to discuss questions/concerns in regards to this study before the 30 day public review starts.

There are particular concerns with this particular Stage of the Master Plan as it relies heavily on the LaSalle residents to perform upgrades/maintenance on their own home drainage systems.

Some background regarding this concern...COTTFN has had several meetings with the City of London regarding the sheer amount of overflows and bypasses that occur in the Thames River. They have cited the issues are primarily caused by weeping tile connections to sanitary sewers and having combined sewer systems in some areas etc. This has been a problem for many years and at one point the city has offered to pay 100% of the fees associated with sump pump installation and there were surprisingly very few participants. Residents are scared of the work involved with weeping tile disconnection, and/or installing a sump pump that can fail.

COTTFNs consultation teams comments/questions include:

- Has the Town of LaSalle asked residents in the Stage 2 area if they were willing to do this?
- How much participation is required to prevent flooding in this area?
- Do the residents in this area have the ability to pay for the upgrades/maintenance? Will the Town of LaSalle offer to help pay for these services via grants?
 - COTTFN Consultation Unit recommends the town of LaSalle to meet with the City of London to discuss the issues with having a solution reliant on voluntary resident participation
- Is there a back up plan if this option is not sufficient to stop the flooding concerns in this area?

Water holds profound significance for COTTFN and other First Nations, representing not just a vital resource but a living entity with spirit. It also plays a central role in cultural and spiritual rituals and therefore the health of the water in COTTFN's Treaty and Traditional territory is important.

If you would like to schedule a meeting to address these concerns, please reach out.

Thanks,



Erna-Marie Leclair (she/her)

Consultation Analyst

Chippewas of the Thames First Nation

Email: emleclair@cottfn.com

Cell: 226-236-0816

320 Chippewa Road, Muncey, Ontario

[Visit us online at cottfn.com](http://cottfn.com)

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April 4, 2023

Chippewas of the Thames First Nation
320 Chippewa Road
Muncey, Ontario
ATT: **Erna-Marie Leclair**

Dear, Ms. LeClair,

Thank you for your comments on the Town of LaSalle Stage 2 Storm Water Master Plan (SWMP) Municipal Class Environmental Assessment.

As the Town of LaSalle doesn't have any combined sewers (where storm drainage is directed into sanitary sewers), the flooding concerns are entirely related to surface drainage. The general findings of the Stage 2 SWMP analysis were that there was little flooding observed within the Study Area, and this is consistent with a general lack of flooding complaints – so overall the drainage system is functioning appropriately. The recommendations of the study are generally good industry practices intended to encourage drainage improvements by individuals to enhance private property flooding protection at the lot level.

The following provides responses to your specific questions:

- **Has the Town of LaSalle asked residents in the Stage 2 area if they were willing to do this?**
 - The recommended solution was advertised and presented at a Public Information Centre on June 20, 2023. No direct objections or concerns to this preferred alternative were brought forward.
- **How much participation is required to prevent flooding in this area?**
 - The recommended improvements are intended to provide homeowners with solutions to address private property flooding concerns, potentially caused by ineffective home drainage systems. Because there was limited systemic flooding observed in the Stage 2 area, the purpose of the recommendation is to enhance flooding protection for individual lots – there is no minimum uptake requirement to prevent flooding in other locations.
- **Do the residents in this area have the ability to pay for the upgrades/maintenance? Will the Town of LaSalle offer to help pay for these services via grants?**
 - This recommended approach was presented to the public and there has been no responses indicating a lack of ability to pay for improvements. The Town of

LaSalle will continue to monitor demand for a financial assistance program (grants or other) and consider if it is deemed appropriate.

- **COTTFN Consultation Unit recommends the Town of LaSalle to meet with the City of London to discuss the issues with having a solution reliant on voluntary resident participation.**
 - The Town is in regular communication with the City of Windsor, who have similar programs and understand some of their challenges and limitations. Should the Town consider implementing a financial assistance program, more detailed discussions will be undertaken.
- **Is there a back up plan if this option is not sufficient to stop the flooding concerns in this area?**
 - Because there was limited systemic flooding observed in the Stage 2 area, the purpose of the recommendation is to enhance flooding protection for individual lots – there is no minimum uptake requirement to prevent flooding in other locations so a back-up plan was not considered necessary.

We hope these responses have sufficiently addressed your questions/concerns. We would be happy to meet with you directly (in person or virtually) for further discussion if that would be helpful.

Regards,



Jonathan Osborne
Director, Public Works

Jonathan Osborne, P.Eng.
Director of Public Works
Town of LaSalle

JO/ml



Stantec Consulting Ltd.
400-1305 Riverbend Road
London ON N6K 0J5

February 22, 2024

Project/File: 161414064

Attention: Chief Joe Miskokomon
Chippewas of the Thames First Nation
320 Chippewa Road
Muncey, ON N0L 1Y0

Hello Chief Miskokomon,

**Reference: Town of LaSalle – Notice of Upcoming Stage 2 Stormwater Master Plan Report,
Municipal Class Environmental Assessment**

As you are aware, the Town of LaSalle is completing an Approach #2 Master Plan, Municipal Class Environmental Assessment to assess the stormwater infrastructure draining directly or indirectly into the Detroit River. A Stormwater Master Plan (SWMP) is being prepared to identify potential infrastructure improvements to protect public and private property from effects of stormwater flooding while also protecting the natural environment.

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Thank you for your interest in this study. We look forward to hearing from you.

From: [Micks, Sarah](#)
To: "justin.logan@delawarenation.on.ca"
Cc: [Jonathan Osborne](#); [Michael Cappucci](#); [Brown, Steve \(Waterloo\)](#); [Hohner, Paula](#)
Subject: Town of LaSalle, Stage 2 Stormwater Master Plan, Approach #2 MCEA - Upcoming Master Plan Report
Date: Thursday, February 22, 2024 4:08:00 PM
Attachments: [let_1614_DelawareNation-UpcomingMP_20240220.pdf](#)

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Thank you,

Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

400-1305 Riverbend Road

London, ON N6K 0J5



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Stantec Consulting Ltd.
400-1305 Riverbend Road
London ON N6K 0J5

February 22, 2024

Project/File: 161414064

Attention: Chief Justin Logan

Delaware Nation
14760 School House Line
Thamesville, ON N0P 2K0

Hello Chief Logan,

**Reference: Town of LaSalle – Notice of Upcoming Stage 2 Stormwater Master Plan Report,
Municipal Class Environmental Assessment**

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Thank you for your interest in this study. We look forward to hearing from you.

Best regards,

STANTEC CONSULTING LTD.



Sarah Micks
Environmental Planner
Phone: 519-432-4292
sarah.micks@stantec.com

Attachment: Figure 1: Study Area Map

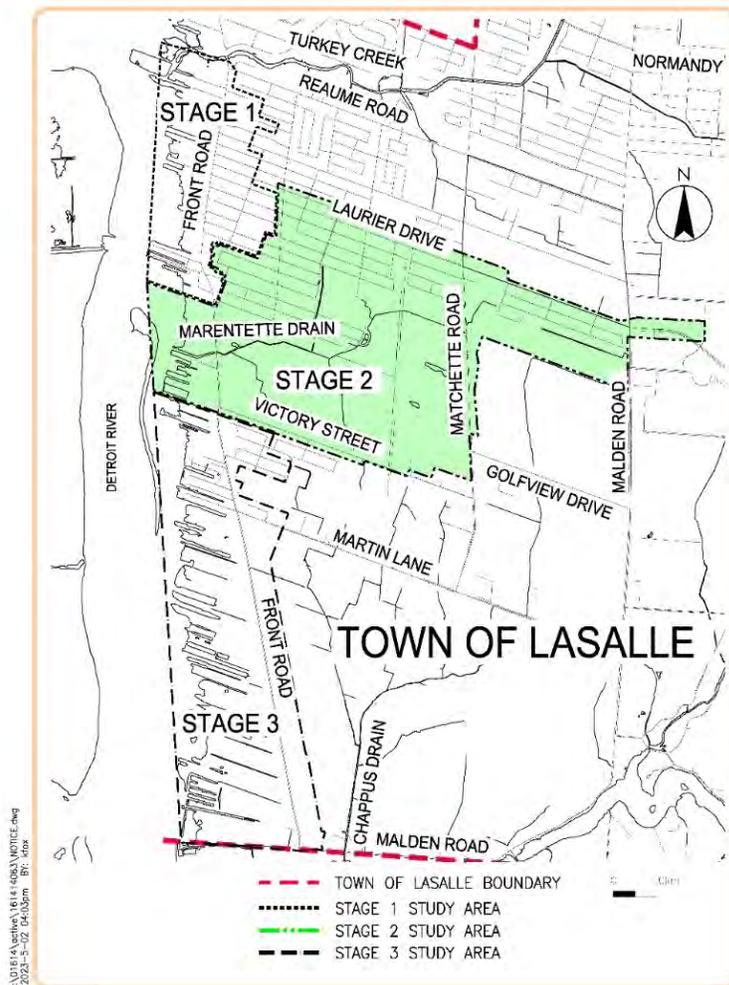


Figure 1: Study Area Map

From: [Micks, Sarah](#)
To: [Consultations](#)
Cc: [Jonathan Osborne](#); [Michael Cappucci](#); [Brown, Steve \(Waterloo\)](#); [Hohner, Paula](#)
Subject: Town of LaSalle, Stage 2 Stormwater Master Plan, Approach #2 MCEA - Upcoming Master Plan Report
Date: Thursday, February 22, 2024 4:10:00 PM
Attachments: [let_1614_MNO-UpcomingMP_20240220.pdf](#)

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Thank you,

Sarah Micks

Environmental Planner

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London, ON N6K 0J5



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Stantec Consulting Ltd.
400-1305 Riverbend Road
London ON N6K 0J5

February 22, 2024

Project/File: 161414064

Attention: Métis Nation of Ontario

66 Slater Street, Suite 1100
Ottawa, ON K1P 5H1

Hello,

**Reference: Town of LaSalle – Notice of Upcoming Stage 2 Stormwater Master Plan Report,
Municipal Class Environmental Assessment**

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Thank you for your interest in this study. We look forward to hearing from you.

Best regards,

STANTEC CONSULTING LTD.



Sarah Micks
Environmental Planner
Phone: 519-432-4292
sarah.micks@stantec.com

Attachment: Figure 1: Study Area Map

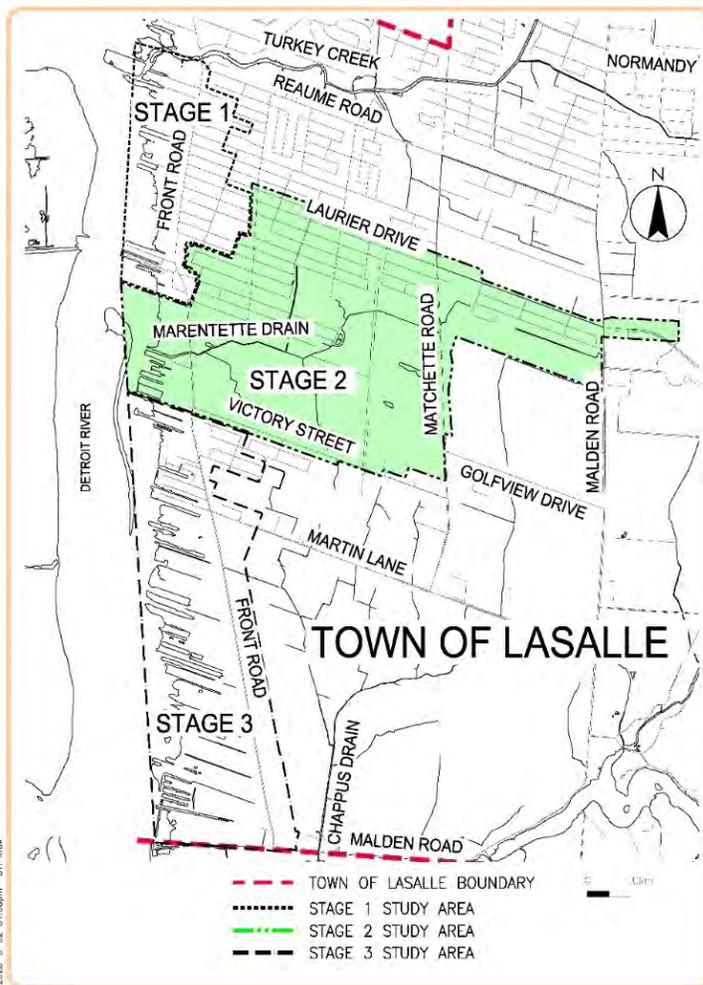


Figure 1: Study Area Map

From: [Micks, Sarah](#)
To: chief@munsee.ca; reception@munsee.ca; [Stacey Phillips](#)
Cc: [Jonathan Osborne](#); [Michael Cappucci](#); [Brown, Steve \(Waterloo\)](#); [Hohner, Paula](#)
Subject: Town of LaSalle, Stage 2 Stormwater Master Plan, Approach #2 MCEA - Upcoming Master Plan Report
Date: Thursday, February 22, 2024 4:11:00 PM
Attachments: [let_1614_Munsee-DelawareNation-UpcomingMP_20240220.pdf](#)

Good Afternoon,

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Thank you,

Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

400-1305 Riverbend Road

London, ON N6K 0J5



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Stantec Consulting Ltd.
400-1305 Riverbend Road
London ON N6K 0J5

February 22, 2024

Project/File: 161414064

Attention: Chief Roger Thomas

Munsee-Delaware Nation
289 Jubilee Road, RR1
Muncey, ON N0L 1Y0

Hello Chief Thomas,

**Reference: Town of LaSalle – Notice of Upcoming Stage 2 Stormwater Master Plan Report,
Municipal Class Environmental Assessment**

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Best regards,

STANTEC CONSULTING LTD.



Sarah Micks
Environmental Planner
Phone: 519-432-4292
sarah.micks@stantec.com

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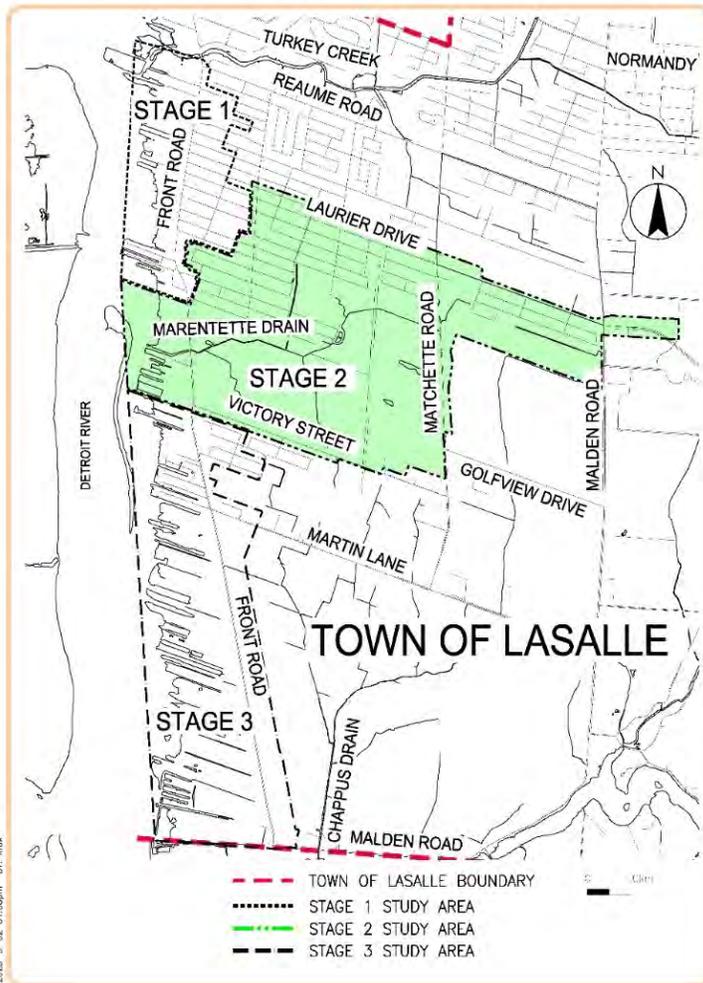


Figure 1: Study Area Map

From: [Micks, Sarah](#)
To: todd.cornelius@oneida.on.ca; [Brandon Doxtator](#)
Cc: [Jonathan Osborne](#); [Michael Cappucci](#); [Brown, Steve \(Waterloo\)](#); [Hohner, Paula](#)
Subject: Town of LaSalle, Stage 2 Stormwater Master Plan, Approach #2 MCEA - Upcoming Master Plan Report
Date: Thursday, February 22, 2024 4:11:00 PM
Attachments: [let_1614_Oneida-UpcomingMP_20240220.pdf](#)

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Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

400-1305 Riverbend Road

London, ON N6K 0J5



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Stantec Consulting Ltd.
400-1305 Riverbend Road
London ON N6K 0J5

February 22, 2024

Project/File: 161414064

Attention: Chief Todd Cornelius

Oneida of the Thames
2212 Elm Avenue
Southwold, ON N0L 2G0

Hello Chief Cornelius,

**Reference: Town of LaSalle – Notice of Upcoming Stage 2 Stormwater Master Plan Report,
Municipal Class Environmental Assessment**

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Thank you for your interest in this study. We look forward to hearing from you.

From: [Micks, Sarah](#)
To: kimberly.bressette@kettlepoint.org; fdesk@kettlepoint.org
Cc: [Jonathan Osborne](#); [Michael Cappucci](#); [Brown, Steve \(Waterloo\)](#); [Hohner, Paula](#)
Subject: Town of LaSalle, Stage 2 Stormwater Master Plan, Approach #2 MCEA - Upcoming Master Plan Report
Date: Thursday, February 22, 2024 4:09:00 PM
Attachments: [let_1614_Kettle&StonyPointFirstNation-UpcomingMP_20240220.pdf](#)

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Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

400-1305 Riverbend Road

London, ON N6K 0J5



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Stantec Consulting Ltd.
400-1305 Riverbend Road
London ON N6K 0J5

February 22, 2024

Project/File: 161414064

Attention: Chief Kimberly Bressette
Chippewas of Kettle and Stony Point First Nation
6247 Indian Lane
Lambton Shores, ON N0N 1J1

Hello Chief Bressette,

**Reference: Town of LaSalle – Notice of Upcoming Stage 2 Stormwater Master Plan Report,
Municipal Class Environmental Assessment**

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From: [Micks, Sarah](#)
To: drskoke@wifn.org; darr.sands@wifn.org
Cc: [Jonathan Osborne](#); [Michael Cappucci](#); [Brown, Steve \(Waterloo\)](#); [Hohner, Paula](#)
Subject: Town of LaSalle, Stage 2 Stormwater Master Plan, Approach #2 MCEA - Upcoming Master Plan Report
Date: Thursday, February 22, 2024 4:12:00 PM
Attachments: [let_1614_Walpole-Bkejwanong-UpcomingMP_20240220.pdf](#)

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Sarah Micks

Environmental Planner

sarah.micks@stantec.com

Direct: 519-432-4292

400-1305 Riverbend Road

London, ON N6K 0J5



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Stantec Consulting Ltd.
400-1305 Riverbend Road
London ON N6K 0J5

February 22, 2024

Project/File: 161414064

Attention: Chief Daniel Miskokomon
Walpole Island First Nation / Bkejwanong Territory
117 Tahgahoning Road
Wallaceburg, ON N8A 4K9

Hello Chief Miskokomon,

**Reference: Town of LaSalle – Notice of Upcoming Stage 2 Stormwater Master Plan Report,
Municipal Class Environmental Assessment**

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APPENDIX B: Natural Heritage Overview





**LASALLE STORMWATER MANAGEMENT
MASTER PLAN ENVIRONMENTAL
ASSESSMENT – NATURAL HERITAGE
OVERVIEW**

FINAL REPORT

February 9, 2023

Prepared for:
Town of LaSalle
5950 Malden Road
LaSalle, ON N9H 1S4

Prepared by:
Stantec Consulting Ltd.
600-171 Queens Avenue
London, ON N6A 5J7

Project Number:
161414063

Limitations and Sign-off

The conclusions in the Report entitled LaSalle Stormwater Management Master Plan Environmental Assessment – Natural Heritage Overview are Stantec’s professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient’s own risk.

Stantec has assumed all information received from Town of LaSalle (the “Client”) and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec’s contract with the Client. While the Report may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec’s discretion.

Prepared by:  Digitally signed
by Ellis, Kayla
Date: 2023.02.09
17:34:34 -05'00'

Signature

Kayla Ellis, B.E.S.
Terrestrial Ecologist

Printed Name and Title

Prepared by:  Allah, Mitch
2023.02.10
08:08:38
-05'00'

Signature

Mitch Allah, Tech. Dipl., B.Sc.
Aquatic Biologist

Printed Name and Title

Reviewed by:  Digitally signed by
Debbie Giesbrecht
Date: 2023.02.09
17:45:03 -05'00'

Signature

Debbie Giesbrecht, M.Sc.
Senior Ecologist

Printed Name and Title

Approved by:  Digitally signed
by Geddes, Sean
Date: 2023.02.09
17:18:12 -05'00'

Signature

Sean Geddes, B.Sc.
Senior Aquatic Biologist

Printed Name and Title



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Appendix B Species at Risk and Significant Wildlife Habitat Assessment Tables

Table B-1	Species at Risk Habitat Assessment
Table B-2	Significant Wildlife Habitat Assessment and SOCC

Appendix C Aquatic Habitat Assessment Photographic Record



1 Introduction

1.1 Study Purpose and Scope

The Town of LaSalle (the Town) retained Stantec Consulting Ltd. (Stantec) to complete a Stormwater Management Master Plan (SWMP) Class Environmental Assessment (EA). The main objective of the SWMP is to identify opportunities for potential infrastructure enhancements and improvements to protect public and private property from the effects of stormwater flooding while preserving the natural environment to the extent possible. The SWMP is also intended to serve as a strategic plan for the Town to envision and plan for appropriate sequencing of strategic remediation, improvements and new construction, and for short and long-term maintenance programs. The planning and design of the SWMP will be carried out in accordance with the requirements of the Master Planning process as outlined in the Municipal Class Environmental Assessment (MCEA) (October 2000, as amended in 2007, 2011 and 2015), which is approved under the Ontario *Environmental Assessment Act*.

This Natural Heritage Overview (NHO) report was prepared as part of the SWMP process and will inform the generation of planning alternatives and assist in the evaluation of alternatives. The Study Area for this NHO is defined as Phase 1 through Phase 3 with a surrounding area of 120 m identified as the Adjacent Lands (**Figure 1, Appendix A**) which encompasses the Town of LaSalle.

The Town is a mix of residential, commercial, agriculture and natural heritage features (**Figure 1-3, Appendix A**). The shoreline and floodplains of the Detroit River are ecologically rich areas of southwestern Ontario that provide important habitat for species at risk (SAR). This NHO examined terrestrial and aquatic species and habitats to identify key natural heritage features that could pose constraints to infrastructure and construction of future projects. Significance of natural heritage features was determined using provincial and municipal policies and relevant guidance documents.

The NHO was primarily a desktop assessment based on a review of background information from regulatory agencies, provincial and federal databases, wildlife atlases, municipal Official Plans and other planning reports. A single site visit within the LaSalle SWMP EA boundaries was also completed to ground truth mapped features and address information gaps, which included characterizing vegetation communities, candidate wildlife habitats and aquatic habitat. Results of the background review and the site investigation were mapped and the significance of natural heritage features was evaluated to identify potential constraints to inform the development of the SWMP.



2 Policy Context

2.1 Federal Context

2.1.1 Species at Risk Act

The federal *Species at Risk Act, 2002* (SARA) was created to prevent wildlife species from becoming extirpated (i.e., extinct in Canada). SARA protects species at risk and their critical habitats, and contains provisions to help manage species of special concern in order to prevent them from becoming endangered or extinct. It includes prohibitions against killing, harming, harassing, capturing or taking species at risk, makes it illegal to destroy their critical habitats, and can impose restrictions on development and construction projects.

Species thought to be at risk in Canada are assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). COSEWIC is an independent body that reviews species based on the broad range of best available scientific data. The committee meets annually to review status reports on species suspected of being at risk and provides assessments to government and the public. The federal Cabinet then decides whether those species should receive legal protection under the SARA. These decisions are made after consultations with affected stakeholders and other groups. Once a species is added to the list of species at risk and legally protected under the SARA, a recovery strategy must be developed. These recovery strategies detail the specific steps that need to be taken to protect the identified species.

The main limitation of SARA is that its legislative coverage extends only to federal lands while the Ontario *Endangered Species Act, 2007* (ESA) covers public and private lands. Only those species currently listed in Schedule 1 of SARA (i.e., those listed as extirpated, endangered, or threatened) are protected by the prohibitions of Sections 32 to 36 and 58 of SARA, and then only on federal lands, except for aquatic species and migratory birds which are protected throughout Canada by other acts and regulations. SARA-listed species designated as special concern are not protected by the prohibitions of Sections 32 to 36 or 58 of SARA; however, these species are protected under Section 79, which states that federal authorities must “identify adverse effects of the project on the listed wildlife species [including special concern species] and its critical habitat...and ensure that measures are taken to avoid or lessen adverse effects.” Furthermore, special concern species do require that provincial or regional management plans, including conservation measures, be developed to protect the species.

2.1.2 Fisheries Act

The Government of Canada is responsible for the management of fisheries resources in Canada through the *Fisheries Act*, administered primarily by Fisheries and Oceans Canada (DFO). The *Fisheries Act* addresses national interests in marine and fresh waters. On June 21, 2019, changes to the Act (Bill C68) received royal assent and became law, restoring previously lost protections and incorporating modern safeguards into the *Fisheries Act*. On August 28, 2019, provisions of the new *Fisheries Act* came into



force including new protections for fish and fish habitat in the form of standards, codes of practice, and guidelines for projects near water.

The *Fisheries Act* prohibits projects causing a harmful alteration, disruption or destruction (HADD) of fish habitat unless authorized by the Minister of Fisheries and Oceans Canada. This applies to work being conducted in or near waterbodies that support fish and fish habitat. The definitions of fish and fish habitat as per the *Fisheries Act* are:

- “fish” includes (a) parts of fish, (b) shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and (c) the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals;
- “fish habitat” means spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly to carry out their life processes.

Typical DFO guidance advises that proponents will be required to demonstrate that measures and standards have been fully applied to first avoid, then mitigate, and then finally, offset or compensate for any HADD that cannot be avoided. This hierarchy is such that efforts should be made initially to avoid impacts. When avoidance is not possible, then efforts should be made to mitigate impacts of the project. If these measures cannot prevent a HADD from occurring a *Fisheries Act* Authorization may be required, which would include a habitat offsetting or compensation plan.

2.2 Provincial Context

2.2.1 Planning Act / Provincial Policy Statement

The Provincial Policy Statement (PPS; MMAH 2020) was issued under Section 3 of the *Planning Act* (PA) and came into effect in 1996, with the most recent revision in May 2020. The PA requires that decisions made by planning authorities are consistent with policy statements such as the PPS, which includes policies on development and land use patterns, resources and public health and safety. Section 2.1 of the PPS deals with natural heritage and requires that natural heritage systems are identified in certain ecoregions. This includes Ecoregion 7E, where the Study Area is located.

According to Section 2.1.4 of the PPS, development and site alteration shall not be permitted in the following features in Ecoregion 7E:

1. significant wetlands,
2. significant coastal wetlands

According to Section 2.1.5 of the PPS, development and site alteration shall not be permitted in the following features, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions in Ecoregion 7E:

1. Significant Woodlands



2. Significant Valleylands
3. Significant Wildlife Habitat
4. Significant Areas of Natural and Scientific Interest
5. Coastal wetlands that are not subject to policy 2.1.4(b)

According to Section 2.1.6 and 2.1.7 of the PPS, development and site alteration shall not be permitted in the following features, except in accordance with provincial and federal requirements:

1. Significant habitat of endangered or threatened species
2. Fish habitat

Development and site alteration are not permitted on lands that are adjacent to the natural heritage features and areas identified above unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

In accordance with PPS Policy 3.1, development is generally directed to areas outside of hazardous lands adjacent to rivers and streams that are impacted by flooding and erosion. No development is permitted with the Regional floodway and should be adequately set back from the steep slopes to avoid potential hazards in consultation with the regional Conservation Authority.

2.2.2 Endangered Species Act, 2007

The provincial *Endangered Species Act, 2007* (ESA) was created to identify species at risk based on the best available scientific information, to protect species that are at risk and their habitats, and to promote the recovery of species that are at risk. The ESA prohibits the killing, harming, harassing, capturing or taking of a living member of a species listed as threatened, endangered or extirpated by the Species at Risk in Ontario (SARO) list, and damage to habitat of protected species.

Species thought to be at risk in Ontario are assessed by the Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is an independent body that reviews species based on the best available science, including community knowledge and Aboriginal traditional knowledge. Once species are classified at risk, they are added to the Species at Risk in Ontario (SARO) list in one of four categories (extirpated, endangered, threatened and special concern). Extirpated, endangered and threatened species on this list automatically receive legal protection under the ESA.

The ESA also provides protection for the habitat of protected species. When a species is classified as endangered or threatened, the habitat of that species is automatically protected under a general definition. The Lieutenant Governor in Council may make specific habitat regulations prescribing an area as habitat of a species that is listed as extirpated, endangered or threatened on the SARO list. A habitat regulation can prescribe an area as the habitat of a species through the description of boundaries or features of an area, or by describing that area in any other manner. Habitat will be regulated with the goal of protecting habitat that promotes the survival and recovery of endangered or threatened species.



The ESA calls for the creation of recovery strategies for endangered or threatened species, and management plans for special concern species. These documents provide advice to the government on steps to take to protect and recover species at risk to healthy population levels.

2.2.3 Essex Region Conservation Authority Regulation 158/06

The *Conservation Authorities Act* (CAA) was created with the purpose of conservation, restoration, development, and management of natural resources in watersheds in Ontario. The CAA is now administered by the Ministry of the Environment, Conservation and Parks (MECP). The Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) is responsible for conservation authorities' activities related to natural hazard management. Conservation Authorities are enabled with regulatory responsibility within their respective jurisdictions. The Essex Region Conservation Authority (ERCA) is the CAA regulatory agency for the Study Area.

Under Ontario Regulation 158/06, ERCA reviews projects and implements their permitting process to achieve the following under the CAA:

- prevent the loss of life and property due to flooding and erosion
- prevent pollution
- conserve and enhance natural resources

The regulation applies to fill placement and removal or site grading, flood prone areas, erosion prone areas, dynamic beach areas, alteration of watercourses, and interference with wetlands.

While considering projects during the review process, ERCA determines if projects are consistent with various policies and guidance documents, such as The *Windsor/Essex Region Stormwater Management Standards Manual* (Stantec 2018) which provides direction for the protection of natural hazards during the stormwater management planning process.

2.3 Local / Municipal Context

2.3.1 Essex County Official Plan

The Essex County Official Plan (OP) (Essex County 2014) was approved by the Minister of Municipal Affairs & Housing on April 28, 2014.

Policies within the Essex County OP were developed to meet the following goals related to natural heritage:

- To protect and enhance the natural heritage system by increasing the amount of core natural area and natural buffers where possible, particularly through restoration efforts.
- To link wildlife habitat and natural heritage areas to each other, human settlements to other human settlements and people to nature.



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- To protect life and property by directing development away from natural and human-made hazards.

The OP acknowledges the importance of natural heritage features and the enhancement of the natural environment of Essex County. Natural Environment features identified in the OP include:

- Provincially Significant Wetlands (PSWs) and Significant Coastal Wetlands
- Significant habitat of endangered or threatened species
- Lands adjacent to significant wetlands and significant coastal wetlands and significant habitat of endangered species and threatened species
- Lands designated in local Official Plans for natural heritage protection
- Fish Habitat
- Significant Woodlands
- Significant areas of natural and scientific interest (ANSI)
- Significant Wildlife Habitat (SWH)
- Significant Valleylands
- Identified significant existing natural heritage feature
- Adjacent lands to significant woodlands, significant valleylands, Provincial and regional ANSIs, and SWH and lands designated in local Official Plans for natural heritage protection and other high priority existing natural features
- Unevaluated wetlands
- Prioritized Restoration Opportunities

Development and site alteration are not permitted on lands designated Natural Environment. Permitted uses are limited to passive recreational uses and activities that create or maintain infrastructure. The continuation of agricultural uses is permitted on lands within the Natural Environment designation.

Secondary priority natural heritage features include woodlands and wildlife habitat. Specific policies apply to these lands when subject to a development review of a Planning Act application. The County encourages local municipalities to undertake Candidate Natural Heritage Studies to identify provincial, regional and locally significant natural heritage features.

Opportunities for restoration to enhance the existing natural heritage system and create linkages among features are also identified in the Essex County OP. Policy 3.4.5.a. states that “Secondary Plans shall evaluate opportunities to enhance and restore the natural heritage features in the area, including the establishment of linkages, to establish buffers, and to set aside strategic areas for restoration and enhancement”.



2.3.2 Town of LaSalle Official Plan

The Town of LaSalle Official Plan (LaSalle OP) (LaSalle 2018) was adopted on May 22, 2018 and approved by the County of Essex on October 3, 2018.

One of the fundamental principles of the Town of LaSalle is to provide a sustainable community. Policies protecting the natural environment are included in Section 4.11 of the LaSalle OP, which states that “the Natural Heritage System within the Town of LaSalle has been established in the Essex Region Natural Heritage System Strategy (ERNHSS) (ERCA 2013) prepared by the ERCA and is included as the Natural Environment Designation and Policies contained within the provincially approved upper-tier (County of Essex) Official Plan.” The Provincially Significant Wetlands and terrestrial features are delineated on Schedule B of the LaSalle OP. Development policies are also aligned with Schedule C as set out in the Essex County OP.

With respect to creating stormwater management facilities, Policy 6.3.5., notes that the Town will encourage opportunities for use of natural vegetation regeneration and contribution to the physical landscape.

A natural heritage discussion paper was prepared for the Town of LaSalle by ERCA (2010) to provide recommendations to inform an Official Plan update. Relevant recommendations are noted in the current study where applicable.



3 Natural Heritage Assessment

3.1 Objective

The purpose of the natural heritage assessment is to characterize the existing natural features within the Study Area using background information and field investigations and identify preliminary constraints to development within the LaSalle SWMP area. The Study Area for this NHO is defined as Phase 1 through Phase 3 with a surrounding area of 120 m identified as the Adjacent Lands (**Figure 1, Appendix A**) which encompasses the Town of LaSalle. Site investigations were not intended to collect data in sufficient detail to address requirements for site-specific characterization, such as would be included in an Environmental Impact Study (EIS). Methods for the background data review and field investigations are described under separate headings below.

3.2 Methods

3.2.1 Background Data Review

The following background data sources and reports were reviewed:

- The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions (Crins et al. 2009)
- Land Information Ontario (LIO) database (NDMNRF 2021a)
- Government of Canada. Species at Risk Public Registry. Accessed April 2021
- Species At Risk in Ontario (SARO) List (database) (MECP 2022)
- Essex County OP (Essex County 2014)
- Town of LaSalle Official Plan (LaSalle 2018)
- Essex Region Natural Heritage System Strategy (NHSS; ERCA 2013)
- ERCA data for ELC and other natural heritage items, obtained through an information request sent April 9, 2021
- Information request sent to NDMNRF April 9, 2021. No response was received.
- Information request sent to Ministry of Environment, Conservation and Parks (MECP) April 9, 2021. A response was received October 28, 2021.
- Town of LaSalle Official Plan Review-Update to the Candidate Natural Heritage Area Inventory (CNHAI; ERCA 2010)
- Ortho-rectified satellite imagery (Essex County 2020)
- The Physiography of Southern Ontario (Chapman and Putnam 2007)

Data were compiled in GIS to support the natural heritage assessment.



For potential occurrences of SAR or provincially rare species, the following sources were consulted for recent (1990 - present) records in the vicinity of the Study Area:

- Natural Heritage Information Centre (NHIC) Biodiversity Explorer database (NDMNRF 2021b)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- Ontario Breeding Bird Atlas (Cadman et al. 2007)
- eBird (eBird 2021)
- iNaturalist (iNaturalist 2021)
- Ontario Butterfly Atlas (TEA 2021)
- Department of Fisheries and Oceans Aquatic Species at Risk Mapping (DFO 2022)
- Essex Region Conservation Authority

These resources generally do not note the exact locations of a species occurrence, with accuracy ranging from 1 km² (NHIC) to 10 km² (wildlife atlases), to municipal boundaries or watersheds. As such they are used as an indicator of potential occurrence in the Study Area. The DFO Aquatic Species at Risk Mapping does provide habitat occurrence and critical habitat data for individual species.

3.2.2 Field Investigations

The purpose of the field visit was to supplement background data and refine the boundaries of features where applicable. One field visit was completed on April 13, 2021 and included Ecological Land Classification (ELC), wildlife and wildlife habitat assessments, and an aquatic habitat assessment.

Investigations were completed on all publicly accessible lands. For all other lands, observations were made from the edge of private property and road rights-of-way (ROW), where available.

Supplementary observations that were documented during fieldwork completed as part of the natural heritage studies for the LaSalle Small Coast Experience project have been included in this report. Those supplementary observations took place on July 9 and August 25, 2021.

3.2.2.1 Ecological Land Classification

Vegetation communities were classified using the Ecological Land Classification (ELC) of vegetation communities using the ELC system for Southern Ontario (Lee et al. 1998) and the updated ELC Catalogue (2008). Vegetation communities were first delineated on current ortho-rectified aerial photography and refined in the field. Field classification was completed to the finest level of resolution (vegetation type) where possible. Field data collection included community composition and structure, and other parameters such as evidence of disturbance. Provincial significance of vegetation communities was based on the rankings assigned by the NHIC (NDMNRF 2021b).



3.2.2.2 Wildlife and Wildlife Habitat

The Study Area was assessed to identify candidate Significant Wildlife Habitat types known to occur within Ecoregion 7E. Candidate features were identified using a combination of ELC and other guidance provided in the Ecoregion Criteria Schedule (MNR 2015), and incidental wildlife observations.

Wildlife (birds, reptiles, insects) were noted incidentally during the site investigation. Species, number of individuals and notes on habitat and behavior were recorded.

3.2.2.3 Fish and Fish Habitat

An aquatic habitat assessment was conducted on April 13, 2021 and consisted of an investigation of watercourses and potential watercourses within the Study Area for each of Phases 1 - 3.

Characterization of aquatic habitat was based on the presence/absence of key aquatic habitat features. The survey consisted of a general description of watercourses, (i.e., dimensions, bank stability, morphology), identification of features that typically contribute to fish habitat (i.e., in-water and riparian cover, substrate) and documentation of fish observations. The assessment did not include a fish community survey. Assessments were conducted from locations with public access.

Field and background data were used to identify potential fisheries and aquatic habitat constraints.

3.2.3 Provincial Status and Sensitivity

Background data and field data were evaluated to determine the significance of natural heritage features associated with the Study Area. The provincial status of vegetation communities, plants and wildlife was determined by reviewing the NHIC database (NDMNR 2021b). Provincial or Sub-national status rankings (S-Ranks) are based on the number of occurrences in Ontario and have the following meanings:

- S1:** critically imperiled; often fewer than 5 occurrences
- S2:** imperiled; often fewer than 20 occurrences
- S3:** vulnerable; often fewer than 80 occurrences
- S4:** apparently secure and common
- S5:** secure and very common
- S?:** unranked or, if following a ranking, rank uncertain (e.g., S3?)

The potential sensitivity of natural heritage features and functions, such as existing wetlands and watercourse functions, was also measured through an assessment of:

- vegetation communities (habitat quality, floral quality index, degree of disturbance)
- sensitive species (plants with a high coefficient of conservatism value)
- patch size
- potential linkage and corridor functions



3.3 Results

3.3.1 Ecological Setting, Physiography and Land Use

The community of LaSalle is in Ecoregion 7E (Crins et al. 2009) and within the Detroit River subwatershed. The underlying physiography is sand plain (Chapman and Putnam 2007).

The Study Area is in the Niagara section of the Deciduous Forest Region (Rowe 1972), also known as the Carolinian Forest. Forests in this region are dominated by broadleaved trees including sugar maple, American beech, basswood, red maple, red oak, white oak, and bur oak, butternut, bitternut hickory, rock elm, silver maple and blue beech. Species such as black cherry, black walnut, sycamore, swamp white oak, and shagbark hickory are also occasionally present. Species considered rare to the province, such as pignut hickory, tulip-tree, chinquapin oak, pin oak, black oak, black gum, blue ash, cucumber-tree, paw paw, Kentucky coffee-tree, red mulberry and sassafras are sporadically present in the forest region. Coniferous trees such as hemlock, white pine, tamarack, eastern white cedar, eastern red cedar and black spruce may be found in isolated patches where soil conditions are favorable.

Current land use in LaSalle is a mix of residential, light industrial and recreation/commercial.

3.3.2 Recent Species Records

There were 189 species at risk (SAR) (i.e., species listed on the SARO list) or Species of Conservation Concern (SOCC) (i.e., S1-3 species identified in the background review in the vicinity of the Study Area).

A description of each species, scientific name, designated status, record source, habitat requirements, potential occurrence of habitat and likelihood of occurrence in the Study Area is in **Appendix B, Table B-1** for SAR, and **Table B-2** for SOCC.

3.3.3 Designated Natural Areas

Designated natural including wetlands, woodlands ANSIs, conservation areas, Important Bird and Biodiversity Areas, locally significant environmentally sensitive areas (ESAs) or conservation priority areas identified in the Study Area are described below.

3.3.3.1 Wetlands

The Ontario Wetland Evaluation System is used to identify PSWs. Evaluated wetlands that do not qualify as provincially significant may be designated as locally significant and may be protected through local planning and policy measures. There may also be unevaluated wetlands in an area.

Five PSWs are located within the Study Area: Canard River Marshes, Canard River Mouth Marsh, Detroit River, Detroit River Marshes and Turkey Creek Marshes (NDMNR 2021a; NDMNR 2021b). The breakdown of wetlands in each phase is as follows:



Phase 1

Three PSWs are located within Phase 1 which includes: Detroit River, Detroit River Marshes and Turkey Creek Marshes (NDMNRF 2021a; NDMNRF 2021b).

Phase 2

Two PSWs are located within Phase 2 which includes: Detroit River, and Detroit River Marshes (NDMNRF 2021a; NDMNRF 2021b).

Phase 3

Two PSWs are located within Phase 3 which includes: Detroit River, and Detroit River Marshes (NDMNRF 2021a; NDMNRF 2021b).

3.3.3.2 Significant Woodlands

A woodland is defined as a treed area, woodlot or forested area. The Natural Heritage Reference Manual notes that the local planning authority has a responsibility for designating significant woodlands (MNR 2010).

The Essex County OP (2014) defines significant woodlands as “All woodlands 2 hectares in size or larger using the size criteria recommended in the Natural Heritage Reference Manual (MNR 2010) and as per the Essex Region Natural Heritage System Strategy. Smaller woodlands may be considered significant if they exhibit composition, age or quality that is uncommon in the municipality or the region.”

Phase 1

Significant woodlands were identified within the Study Area.

Phase 2

Significant woodlands were identified within the Study Area.

Phase 3

Significant woodlands were identified within the Study Area.

3.3.3.3 Significant Valleylands

Valleylands are linear natural areas that occur in a valley or other landform depression that have water flowing through or standing for some period of the year (MNR 2010).

Phase 1

No valleylands were identified within the Study Area.



Phase 2

Significant valleylands were identified associated with the Marentette Drain within the Study Area though the Town of LaSalle Official Plan Review-Update to the Candidate Natural Heritage Area Inventory (CNHAI; ERCA 2010).

Phase 3

No valleylands were identified within the Study Area.

3.3.3.4 Areas of Natural and Scientific Interest

Life science ANSIs are significant representative segments of Ontario’s biodiversity and natural landscapes, including specific types of forests, valleys, prairies, savannahs, alvars and wetlands, their native plants and animals, and their supporting environments.

Phase 1

No life science ANSIs were identified within the Study Area.

Phase 2

A single life science ANSI, the Reaume Prairie, was identified in the Study Area (NDMNRF 2021a; NDMNRF 2021b).

Phase 3

No life science ANSIs were identified within the Study Area.

3.3.3.5 Other Designated Natural Areas

The Study Area is located within the Lower Detroit River Important Bird and Biodiversity Area (IBA) which recognizes globally significant congregatory species, waterfowl concentrations, colonial waterbirds/seabird concentrations, and nationally significant congregatory species (IBA Canada 2021).

Phase 1

Phase 1 is located within Lower Detroit River IBA (IBA Canada 2021). There are ERCA regulated areas throughout the Study Area.

Phase 2

Phase 2 is located within Lower Detroit River IBA (IBA Canada 2021). There are ERCA regulated areas throughout the Study Area.



Phase 3

Phase 3 is located within Lower Detroit River IBA (IBA Canada 2021) and contains Petite Cote Conservation Area, owned and operated by ERCA. There are ERCA regulated areas throughout the Study Area.

3.3.4 Vegetation Communities

Forty-seven (47) vegetation community types were identified within the study area, including 36 natural or naturalized communities, three agricultural communities, three greenlands, and five constructed communities.

Table 3.1 includes a list of vegetation communities in the Study Area (by Phase) and they are mapped on **Figure 2.1, Appendix A**.

Table 3.1 Summary of Vegetation Communities and Areas

ELC Code	ELC Description	Area per Phase in Hectares (ha)			
		Phase 1	Phase 2	Phase 3	Grand Total
Wetland					
MAM/MAS	Meadow Marsh/Shallow Marsh		0.44	3.97	4.41
MAMM1	Graminoid Mineral Meadow Marsh Ecosite	3.02	1.36		4.38
MAS/MAM	Shallow Marsh/ Meadow Marsh			2.93	2.93
MASM1	Graminoid Mineral Shallow Marsh Ecosite		0.17		0.17
MASM1/MAMM1	Graminoid Mineral Shallow Marsh Ecosite/Graminoid Mineral Meadow Marsh Ecosite			48.83	48.83
MASM1-12	Common Reed Mineral Shallow Marsh Type	1.05		30.45	31.50
MASM1-12/MAMM1	Common Reed Mineral Shallow Marsh Type/Graminoid Mineral Meadow Marsh Ecosite			10.06	10.06
Native Phragmites		0.37			0.37
OA	Open Water		1.17	0.27	1.44
OA0	Open Aquatic	0.00	3.27		3.27
OA0/MAS	Open Aquatic/Shallow Marsh	35.97	19.24	74.77	129.98
SWD	Deciduous Swamp		4.75	5.53	10.28
SWDM1/FODM9	Oak Mineral Deciduous Swamp Type/ Fresh – Moist Oak – Maple – Hickory Deciduous Forest Ecosite		0.99		0.99
SWDM1-1	Swamp White Oak Mineral Deciduous Swamp Type		2.34		2.34
SWDM1-3	Pin Oak Mineral Deciduous Swamp Type		41.02		41.02



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ELC Code	ELC Description	Area per Phase in Hectares (ha)			
		Phase 1	Phase 2	Phase 3	Grand Total
SWDM1-3/FODM8-2	Pin Oak Mineral Deciduous Swamp Type/ Fresh – Moist Sassafras Deciduous Forest Type		0.87		0.87
SWDM1-3/FODM9	Pin Oak Mineral Deciduous Swamp Type/ Fresh – Moist Oak – Maple – Hickory Deciduous Forest Ecosite		4.78		4.78
SWDM1-4	Shumard's Oak Mineral Deciduous Swamp Type		6.47		6.47
SWDM3-3	Swamp Maple Mineral Deciduous Swamp Type			1.15	1.15
SWDM4	Mineral Deciduous Swamp Ecosite	2.85			2.85
SWTM2-3	Gray Dogwood Mineral Deciduous Thicket Swamp Type		2.06		2.06
Meadow/Prairie					
MEM	Mixed Meadow		1.93		1.93
MEMM2	Fresh - Moist Mixed Tallgrass Prairie Ecosite		3.05		3.05
MEMM3	Dry - Fresh Mixed Meadow Ecosite		0.09		0.09
MEMM4	Fresh - Moist Mixed Meadow Ecosite	1.01	2.56		3.57
MEMM4/OAO	Fresh - Moist Mixed Meadow Ecosite/ Open Aquatic		1.32		1.32
Thicket					
THD	Deciduous Thicket		5.17		5.17
THD/MEMM3	Deciduous Thicket/ Dry - Fresh Mixed Meadow Ecosite		0.00		0.00
Woodland					
WODM6-1	Fresh – Moist Oak Tallgrass Woodland Type		1.38		1.38
Forest					
FODM1-3	Dry-Fresh Black Oak Deciduous forest		3.57		3.57
FODM5	Dry-Fresh Sugar Maple Deciduous Forest Ecosite		0.86		0.86
FODM7	Fresh-Moist Lowland Forest Ecosite			3.17	3.17
FODM7-3	Fresh – Moist Willow Lowland Deciduous Forest Type	0.47			0.47
FODM8-2	Fresh – Moist Sassafras Deciduous Forest Type		2.27		2.27
FODM9	Fresh – Moist Oak – Maple – Hickory Deciduous Forest Ecosite		1.13		1.13
FODM9-2	Fresh – Moist Oak – Maple Deciduous Forest Type		4.66		4.66



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ELC Code	ELC Description	Area per Phase in Hectares (ha)			
		Phase 1	Phase 2	Phase 3	Grand Total
Agriculture					
Ag	Agriculture	0.30	91.91	31.47	123.67
TAG	Treed Agriculture			2.92	2.92
TAGM1	Coniferous Plantation		2.12		2.12
Greenlands					
CGL_1	Golf Course		52.63		52.63
CGL_2	Parkland	6.56	3.04		9.60
CGL_4	Recreational		0.00		0.00
Constructed					
CVC	Commercial and Institutional	8.94	23.69	52.21	84.84
CVC_2	Light Industry	0.31			0.31
CVI_1	Transportation	4.21	8.20	6.93	19.34
CVR	Residential	88.84	221.47	67.78	378.10
CVR/CVC	Residential/Commercial and Institutional	2.99		6.21	9.20
Area per Phase in Hectares (ha)		156.89	520.00	348.65	1025.54

Phase 1

No significant vegetation communities were observed in Phase 1, however there is an area that contains a population of native Phragmites (**Figure 2.1, Appendix A**), which does not have its own ELC code but it is notable because it is distinct from the non-native invasive Phragmites.

Phase 2

There were two provincially rare vegetation communities in the Phase 2 area (ERCA 2010): Fresh - Moist Mixed Tallgrass Prairie Ecosite (MEMM2) and Fresh – Moist Oak Tallgrass Woodland Type (WODM6-1). These two communities support many plant and wildlife SAR and SOCC as summarized in **Table 3.2** and **Table 3.3** below.



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Table 3.2 Significant Species within Fresh – Moist Mixed Tallgrass Prairie Ecosite; MEMM2

Common Name	Latin Name	Provincial S-rank	SARO Status	SARA Schedule 1
Eastern Foxsnake (Carolinian)	<i>Pantherophis gloydi</i>	S2	END	END
Chimney Swift	<i>Chaetura pelagica</i>	S4B, S4N	THR	THR
White Colicroot	<i>Aletris farinosa</i>	S2	END	END
Butternut	<i>Juglans cinerea</i>	S2?	END	END
Dense Blazing-star	<i>Liatris spicata</i>	S2	THR	THR
Purple Twayblade	<i>Liparis liliifolia</i>	S2S3	THR	THR
Willow-leaved Aster	<i>Symphyotrichum praealtum</i>	S2	THR	THR
Large-flowered Purple False Foxglove	<i>Agalinis purpurea var. purpurea</i>	S1		
Slim-spike Threeawn Grass	<i>Aristida longespica var. longespica</i>	S2		
Purple Milkweed	<i>Asclepias purpurascens</i>	S1		
Field Sedge	<i>Carex conoidea</i>	S3		
Pignut Hickory	<i>Carya glabra</i>	S3		
Tall Tickseed	<i>Coreopsis tripteris</i>	S1S2		
Slender Fragrant Goldenrod	<i>Euthamia caroliniana</i>	S1		
Pumpkin Ash	<i>Fraxinus profunda</i>	S1		
Eastern Yellow Stargrass	<i>Hypoxis hirsuta</i>	S2S3		
Two-flowered Dwarf-dandelion	<i>Krigia biflora</i>	S2		
Hairy Pinweed	<i>Lechea mucronata</i>	S3		
Bushy Seedbox	<i>Ludwigia alternifolia</i>	S1		
Winged Loosestrife	<i>Lythrum alatum</i>	S3		
Black Gum	<i>Nyssa sylvatica</i>	S3		
Gray-headed Prairie Coneflower	<i>Ratibida pinnata</i>	S3		
Climbing Prairie Rose	<i>Rosa setigera</i>	S2S3	SC	SC
Tall Nutrush	<i>Scleria triglomerata</i>	S1		
White Blue-eyed-grass	<i>Sisyrinchium albidum</i>	S1		
Riddell's Goldenrod	<i>Solidago riddellii</i>	S3	SC	SC
Skunk Meadow-rue	<i>Thalictrum amphibolum</i>	S3		
Giant Ironweed	<i>Vernonia gigantea</i>	S1?		
Culver's Root	<i>Veronicastrum virginicum</i>	S2		



Table 3.3 Significant Species within Fresh – Moist Oak Tallgrass Woodland Type; WODM6-1

Common Name	Latin Name	Provincial S-rank	SARO Status	SARA Schedule 1
Southern Cloudywing	<i>Thorybes bathyllus</i>	S3		
Monarch	<i>Danaus plexippus</i>	S4B, S2N	SC	SC
Large-flowered Purple False Foxglove	<i>Agalinis purpurea var. purpurea</i>	S1		
Pignut Hickory	<i>Carya glabra</i>	S3		
Tall Tickseed	<i>Coreopsis tripteris</i>	S1S2		
Winged Loosestrife	<i>Lythrum alatum</i>	S3		
Gray-headed Prairie Coneflower	<i>Ratibida pinnata</i>	S3		
Climbing Prairie Rose	<i>Rosa setigera</i>	S2S3	SC	SC
Eastern Stiff-leaved Goldenrod	<i>Solidago rigida ssp. rigida</i>	S3		
Giant Ironweed	<i>Vernonia gigantea</i>	S1?		
Culver's Root	<i>Veronicastrum virginicum</i>	S2		

Phase 3

There were no significant vegetation communities in Phase 3.

3.3.5 Wildlife and Wildlife Habitat

Species identified in the background review as potentially occurring were further refined during the field visit.

3.3.5.1 Wildlife Observations

The following species were observed during the April 13, 2021 field visit:

- Midland Painted Turtle
- Northern Map Turtle
- Eastern Gartersnake
- Northern Leopard Frog
- Green Frog
- American Toad
- American Bullfrog
- Osprey
- Muskrat



A Bald Eagle nest was observed outside of the Study Area, however the Significant Wildlife Habitat associated with this species overlaps with the Study Area.

A summary of key species observations from fieldwork visits is provided in **Table 3.4** and locations of these observations are shown on **Figure 2, Appendix A**.

Table 3.4 Key Wildlife Observations

Phase	Date	Species	Location, behavior, number of individuals observed
1	July 9, 2021	Barn Swallow	1 individual observed foraging near marina. 6 individuals were fledglings situated on a post near the marina begging for food.
		Bald Eagle	A pair (2) observed flying over the Study Area.
	August 25, 2021	Northern Map Turtle	Two individuals basking along the marina.
		Turtle Species	Two predated turtle nests observed near the marina.
2	April 13, 2021	Bald Eagle	Individual on nest just outside of the Phase 2 Study Area.
		Painted Turtle	Three hatchlings observed within MEMM4/OAO community.
3	April 13, 2021	Northern Map Turtle	Over 30 individuals observed basking in the OAO/MAS community.
		Painted Turtle	Over 20 individuals observed basking in the OAO/MAS community.

3.3.5.2 Significant Wildlife Habitat

The evaluation of SWH using ecoregion 7E criteria (MNR 2015) is provided in **Table B-2, Appendix B**. Site-specific investigations to identify species use of wildlife habitat and confirm SWH was beyond the scope of this study but additional investigations can be undertaken at the detail design phase if needed.

Wildlife habitat includes habitat for species listed as Special Concern or ranked provincially rare (S1-S3) and the four categories of SWH. Presence or absence of candidate SWH is discussed below.

Seasonal concentration areas are sites where large numbers of a species gather at one time of the year, or where several species congregate. Only the best examples of these concentration areas are typically designated as SWH. Review of the NHIC and LIO databases did not identify any confirmed seasonal concentration areas within the Study Area. Candidate SWH for seasonal concentration areas was present in the Study Area and is summarized by phase below.

Phase 1

- Aquatic waterfowl stopover and staging habitat (confirmed)
- Shorebird migratory stopover habitat
- Turtle wintering area
- Snake hibernaculum



Phase 2

- Aquatic waterfowl stopover and staging habitat (confirmed)
- Shorebird migratory stopover habitat
- Raptor wintering area
- Bat maternity colonies
- Turtle wintering area
- Snake hibernaculum
- Colonial-nesting bird breeding habitat

Phase 3

- Aquatic waterfowl stopover and staging habitat (confirmed)
- Shorebird migratory stopover habitat
- Turtle wintering area
- Snake hibernaculum
- Colonial-nesting bird breeding habitat

Rare Vegetation Communities or Specialized Habitats for Wildlife are defined as separate components of SWH. Rare habitats are habitats with vegetation communities that are considered rare (S1-S3) in the province. These habitats are generally at risk and may support wildlife species that are considered significant. Specialized habitats are microhabitats that are critical to some wildlife species. Candidate rare or specialized habitats are discussed in **Table B-2, Appendix B**. Candidate habitat for rare vegetation communities or specialized habitats for wildlife observed in the Study Area are summarized by phase below.

Phase 1

- Waterfowl nesting area
- Bald Eagle and Osprey nesting, foraging and perching habitat
- Turtle nesting area
- Amphibian breeding habitat

Phase 2

- Savannahs
- Tall-grass prairies
- Bald Eagle and Osprey nesting, foraging and perching habitat
- Seeps and springs
- Amphibian breeding habitat



Phase 3

- Waterfowl nesting area
- Bald Eagle and Osprey nesting, foraging and perching habitat
- Turtle nesting area
- Amphibian breeding habitat

Habitat for species of conservation concern includes four types of species: those that are rare, those whose populations are significantly declining, those that have been identified as being at risk to certain common activities, and those with relatively large populations in Ontario compared to the remainder of the globe. Habitat for Special Concern and Rare Wildlife (S1-S3 ranked species, including provincially designated Special Concern species) that were identified during the background review with potential to occur in the Study Area is provided in **Table B-2, Appendix B**. Candidate specialized habitats are summarized for each Phase below.

Phase 1

- Marsh bird breeding habitat
- Terrestrial Crayfish

Phase 2

- Marsh bird breeding habitat

Phase 3

- Marsh bird breeding habitat
- Terrestrial Crayfish

3.3.6 Fish and Fish Habitat

Fish habitat was assessed at watercourses within the Study Area for Phases 1 to 3. Watercourses were given an identifier (ex. WC-1). Fish habitat assessment locations are shown on **Figure 2, Appendix A**. A photographic record of aquatic habitat at assessment locations is provided in **Appendix C**. Results of the fish habitat assessments are provided below for each Phase area.

Phase 1

Fish habitat was found in two watercourses within the Phase 1 boundary including Turkey Creek and the Detroit River.

WC-1 Turkey Creek – Turkey Creek was assessed from G. Craig Park on the east side of the Front Road bridge. Turkey Creek is a slow flowing watercourse with a flat morphology. Water clarity was poor with high turbidity. In-water cover included large organic debris and emergent vegetation (Phragmites) on the shoreline margins. Other aquatic vegetation such as submergent, floating and emergent species may be present during the growing season. Turkey Creek is mapped as providing habitat for SAR and SOCC



fish (DFO 2022) and field assessment results indicate the potential habitat for SAR and SOCC in Turkey Creek including:

- SAR - Pugnose Minnow (*Opsopoeodus emiliae*), Pugnose Shiner (*Notropis anogenus*)
- SOCC - Northern Sunfish (*Lepomis peltastes*), Spotted Sucker (*Minytrema melanops*), Mapleleaf (*Quadrula quadrula*)

WC-2 Detroit River – The Detroit River was assessed from Gil Maure Park. The Detroit River is a large waterbody with run to flat morphology and shoreline wave action. The river is contiguous through all study Phases and habitat is similar throughout the Study Area. Within the Study Area are the Detroit River Marshes and constructed inlets and marinas. Much of the shoreline was developed and hardened with erosion control steel sheet piling. The Detroit River is mapped as providing habitat for SAR and SOCC fish (DFO 2022) and field assessment results indicate the potential for habitat for SAR and SOCC in Detroit River including:

- SAR - Channel Darter (*Percina copelandi*), Northern Madtom (*Noturus stigmosus*), Pugnose Minnow, Lake Sturgeon (*Acipenser fulvescens*), Pugnose Shiner, Threehorn Wartyback (*Obliquaria reflexa*) and Lilliput (*Toxolasma parvum*)
- SOCC - Northern Sunfish, Spotted Sucker, Mapleleaf

Phase 2

There are eight mapped watercourses within the Phase 2 boundary area. Two of the watercourses (WC-3, WC-5) were confirmed to provide fish habitat as fish were observed during the field assessment. All the watercourses within Phase 2 are classified as municipal drains and all were modified for agricultural or municipal drainage purposes under the Drainage Act. Some of the watercourses have open channel flow with sections that are piped underground and some are completely piped underground. Only four of the watercourses in Phase 2 could be assessed in the field due to land access restrictions.

WC-3 Marentette Drain – The Marentette Drain is a highly modified and permanently flowing watercourse. The watercourse begins on the west side of Malden Road and ends at its confluence with the Detroit River. The watercourse is considered a municipal drain and has been identified as a DFO Drain Class C (OMAFRA 2020). Watercourses with DFO Drain Class C have a permanent flow, and no sensitive fish species present (DFO 2017). The watercourse flows through residential, agricultural, and forested land uses. The entire watercourse has been straightened with some sections piped underground and some sections exhibiting open channel flow. The drain provides fish habitat and is mapped to support two SOCC fish species including the Northern Sunfish and Spotted Sucker (DFO 2022). The SOCC habitat is mapped from the confluence with the Detroit River to Front Road, however, aquatic SOCC may also utilize habitat upstream from Front Road. At Front Road, the Marentette Drain was a wide and slow flowing channel with flat morphology and an estimated 7 m wetted width and greater than 1 m depth. Water clarity was poor due to high turbidity. In-water cover included small and large woody debris and emergent vegetation (phragmites) on the shoreline margins. Assessed in Gilbert Park, the channel wetted width was 1 m wide and 25 cm deep with fine mineral and organic debris substrates and minimal in-water



cover or bank cover. A school of shiner species was observed in the channel in Gilbert Park. At Malden Road the watercourse had a channel wetted width of 70 cm and 15 cm depth and was flanked by manicured lawn.

WC-4 Lafferty Drain – The Lafferty Drain is considered a municipal drain and has a DFO Drain Class F (OMAFRA 2020). Watercourses with DFO Drain Class F have an intermittent flow (DFO 2017). The Lafferty Drain flow is piped underground and fish habitat is not present in the Study Area.

WC-5 North Branch Railway Drain – The North Branch Railway Drain had a straightened channel through a residential area. The channel began south of Sacred Heart Drive and was open up to north of Gary Avenue at which point it is piped underground. The watercourse is considered a municipal drain, and DFO Drain Class F (OMAFRA 2020). The open portion of the drain channel had a wetted width of 4 m, depth of 30 cm, and fine organic substrates. Fish habitat was confirmed in the open portion with observations of shiner species and yellow perch (*Perca flavescens*) south of International Avenue.

WC-6 Bessette Drain – The Bessette Drain flow is piped underground. Fish habitat is not present in Bessette Drain in the Study Area. Bessette Drain is considered a municipal drain and is DFO Drain Class F (OMAFRA 2020).

WC-7 Durocher Drain – Durocher Drain was not field assessed because access was not available. Durocher Drain is considered a municipal drain, and DFO Class NR (no rating) (OMAFRA 2020). Aerial imagery shows the Durocher Drain as an open channel entirely within an agricultural field, with the potential to connect with Marentette Drain. The Drain may provide fish habitat permanently, or seasonally, depending on the flow regime.

WC-8 Gignac Drain – The Gignac Drain was not field assessed because access was not available. Gignac Drain is considered a municipal drain, and DFO Class NR (OMAFRA 2020). Aerial imagery shows the Gignac Drain as an open channel beginning in an agricultural field, with potential to connect with Marentette Drain. The Drain may provide fish habitat permanently, or seasonally, depending on the flow regime.

WC-9 Chappus Drain – The Chappus Drain was not field assessed because access was not available. Chappus Drain is considered a municipal drain, and DFO Class F (NDMNR 2021a). Aerial imagery shows the Chappus Drain as mostly open channel with a section of underground piped flow under a residential area. The drain is a tributary to the Canard River and may provide fish habitat permanently, or seasonally, depending on the flow regime.

WC-10 St. Michaels Drain – Most of the St. Michaels Drain was not field reviewed because access was not available. Where the watercourse flows through natural areas there is open channel flow; however, along Matchette Road the watercourse flow is primarily piped underground. The St. Michaels Drain is considered a municipal drain, and DFO Class F (OMAFRA 2020). LIO (MNR 2019a) data show SAR distribution in this drain (species not published) (**Figure 1, Appendix A**), however, presence of aquatic SAR is not shown on DFO SAR Mapping (DFO 2022) for this watercourse. Fish habitat may be present where the drain has open channel flow.



Phase 3

There are two mapped watercourses within the Phase 3 boundary area.

WC-11 Martin-Bergeron Drain – The Martin-Bergeron Drain was assessed in Victory Park off Runsteidler Drive. Within the park the channel was modified to flow around the boundary of the park land. The channel wetted width was 2.0 m and depth was 30 cm. There were fine mineral substrates and reed canary vegetation on the banks. The watercourse was piped underground to the north/west for residential development. Aerial imagery shows the watercourse may have open channel flow through agricultural fields to the south. The watercourse is considered a municipal drain, with a DFO Drain Class F (OMAFRA 2020). Martin-Bergeron Drain is a tributary of the Chappus Drain and contributes flow to the Canard River, and may provide fish habitat permanently, or seasonally, depending on the flow regime.

WC-12 Bondy Bastein Drain – Most of the Bondy Bastein Drain was not field reviewed because access was not available. The drain was assessed from Front Road North where it was observed to be a phragmites dominant wetland with water present. Bondy Bastein Drain is considered a municipal drain, with DFO Drain Class F (OMAFRA 2020). The Drain may provide fish habitat permanently, or seasonally, depending on the flow regime.

3.3.7 Endangered and Threatened Species

Species listed as endangered or threatened under the ESA that may be present in the Study Area based on records or availability of suitable habitat are listed in **Table 3.5**. A conservative approach was taken such that if a general habitat type was present, the species was assumed to have potential to be present. Site-specific investigations, such as through an EIS may be needed to support planning.

A description of habitat preferences for each species and an assessment of habitat potential in the Study Area is provided in **Table B-1, Appendix B**.

Table 3.5 Endangered and Threatened Species that may be present in the Study Area

Common Name	Latin Name	Provincial S-rank	SARO Status	SARA Schedule 1
BUTTERFLIES				
Mottled Duskywing ⁷	<i>Erynnis martialis</i>	S2	END	END-NS
BUMBLE BEES				
Rusty-patched Bumble Bee ³	<i>Bombus affinis</i>	S1	END	END
REPTILES				
Blanding's Turtle ^{2,3}	<i>Emydoidea blandingi</i>	S3	THR	END
Spotted Turtle ⁵	<i>Clemmys guttata</i>	S2	END	END
Eastern Spiny Softshell ³	<i>Apalone spinifera spinifera</i>	S2	END	END
Five-lined Skink (Carolinian) ³	<i>Eumeces fasciatus</i>	S2	END	END
Butler's Gartersnake ^{2,3,9}	<i>Thamnophis butleri</i>	S2	END	END
Queensnake ^{2,3}	<i>Regina septemvittata</i>	S2	END	END



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Common Name	Latin Name	Provincial S-rank	SARO Status	SARA Schedule 1
Eastern Hog-nosed Snake ²	<i>Heterodon platirhinos</i>	S3	THR	THR
Eastern Foxsnake (Carolinian) ^{2,9}	<i>Pantherophis gloydi</i>	S2	END	END
Eastern Massasauga (Carolinian) ³	<i>Sistrurus catenatus catenatus</i>	S1	END	END
BIRDS				
Eastern Whip-poor-will ^{3,6}	<i>Antrostomus vociferus</i>	S4B	THR	THR
Chimney Swift ^{6,9}	<i>Chaetura pelagica</i>	S4B	THR	THR
Acadian Flycatcher ^{6,9}	<i>Empidonax virescens</i>	S1B	END	END
Bank Swallow ⁶	<i>Riparia riparia</i>	S4B	THR	THR
Yellow-breasted Chat ^{3,6}	<i>Icteria virens</i>	S2B	END	END
Bobolink ^{3,6}	<i>Dolichonyx oryzivorus</i>	S4B	THR	THR
Eastern Meadowlark ⁶	<i>Sturnella magna</i>	S4B	THR	THR
Red-headed Woodpecker ⁶	<i>Melanerpes erythrocephalus</i>	S3	END	END
MAMMALS				
Little Brown Myotis ¹	<i>Myotis lucifugus</i>	S3	END	END
PLANTS				
Skinner's False Foxglove ³	<i>Agalinis skinneriana</i>	S1	END	END
White Colicroot ^{3,9}	<i>Aletris farinosa</i>	S2	END	END
Scarlet Ammannia ³	<i>Ammannia robusta</i>	S1	END	END
American Chestnut ³	<i>Castanea dentata</i>	S1S2	END	END
Spotted Wintergreen ⁵	<i>Chimaphila maculata</i>	S2	THR	THR
Eastern Flowering Dogwood ³	<i>Cornus florida</i>	S2?	END	END
Black Ash ⁹	<i>Fraxinus nigra</i>	S4	END	THR
Butternut ⁹	<i>Juglans cinerea</i>	S2?	END	END
Slender Bush-clover ⁵	<i>Lespedeza virginica</i>	S1	END	END
Dense Blazing-star ^{3,9}	<i>Liatris spicata</i>	S2	THR	THR
Purple Twayblade ^{3,9}	<i>Liparis liliifolia</i>	S2S3	THR	THR
Red Mulberry ^{3,9}	<i>Morus rubra</i>	S2	END	END
Eastern Prairie Fringed Orchid ³	<i>Platanthera leucophaea</i>	S2	END	END
Pink Milkwort ³	<i>Polygala incarnata</i>	S1	END	END
Willow-leaved Aster ^{3,9}	<i>Symphotrichum praealtum</i>	S2	THR	THR
FISH				
Lake Sturgeon (Great Lakes - Upper St. Lawrence River population) ³	<i>Acipenser fulvescens</i> pop. 3	S2	THR	THR
Pugnose Shiner ¹⁰	<i>Notropis anogenus</i>	S2	THR	THR
Northern Madtom ¹⁰	<i>Noturus stigmosus</i>	S1	END	END
Pugnose Minnow ¹⁰	<i>Opsopoeodus emiliae</i>	S2	THR	THR



Common Name	Latin Name	Provincial S-rank	SARO Status	SARA Schedule 1
MUSSELS				
Threehorn Wartyback ¹⁰	<i>Obliquaria reflexa</i>	S1	THR	THR
Lilliput ¹⁰	<i>Toxolasma parvum</i>	S1	THR	END

¹ Atlas of the Mammals of Ontario

² Ontario Reptile and Amphibian Atlas

³ NHIC

⁴ eBird

⁵ iNaturalist

⁶ Atlas of the Breeding Birds of Ontario

⁷ Ontario Butterfly Atlas

⁸ Odonata Atlas Database

⁹ Town of LaSalle Update to the Candidate Natural Heritage Area Inventory

¹⁰ DFO SAR Mapping

THR – threatened

END – endangered

3.4 Summary of Significant Natural Heritage Features

The review of background information, combined with the results of the field investigation identified a number of natural heritage features within Phase 1, Phase 2 and Phase 3 of the Study Area. **Table 3.6** below summarizes the occurrence of significant natural heritage features corresponding to each Phase.

Table 3.6 Natural Heritage Features within the Study Area

Natural Heritage Feature	Present in Phase 1	Present in Phase 2	Present in Phase 3
Provincially Significant Wetlands	X	X	X
Significant Woodlands	X	X	X
Significant Valleylands		X	
Other Designated Natural Areas	X	X	X
Significant Wildlife Habitat	X	X	X
Areas of Natural & Scientific Interest		X	
Fish Habitat	X	X	X
Habitat of endangered or threatened species (potential)	X	X	X



4 Potential Natural Heritage Constraints

Potential areas of constraint that require further consideration and additional study at the detail design stage have been identified on **Figure 3, Appendix A**. The identification of constraint areas on **Figure 3** does not mean that development cannot occur in these areas, but rather that further examination is required as to the nature and extent of constraints and the potential for additional permitting requirements from relevant agencies such as DFO, ERCA, MECP and NDMNRF. The red highlighting of areas on the map points to areas that may require further field investigations at the detail design stage and planning should take into consideration the extent of natural heritage features, SWH, presence of SAR/SOCC and the potential need for specialized mitigation efforts tailored to site-specific conditions.



5 Conclusion

This Natural Heritage Overview was prepared to assist the Town of LaSalle in identifying key natural heritage features and inform the development and analysis of alternatives for the development of the Stormwater Management Master Plan. A review of background information and data combined with preliminary field data has identified portions of the Study Area which support significant natural heritage features and functions. Existing policy/regulatory frameworks and relevant guidance documents provide direction for the identification of potential constraint areas where additional information, site investigations and regulatory considerations may be required at the detail design stage.



6 References

- Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier. 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. (eds) Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of natural resources, and Ontario Nature, Toronto, xxii +706pp. Data available online: <http://www.birdsontario.org/atlas/squareinfo.jsp?lang=en>
- Chapman, L.J. and Putnam, D.F. 2007. Physiography of southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 228.
- Crins, W.J., P.A. Gray, P.W.C. Uhlig, and M.C. Webster. 2009. The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions. Ontario Ministry of Natural Resources, Peterborough Ontario, Inventory, Monitoring and Assessment, SIB TER IMA TR-01.
- [DFO] Fisheries and Oceans Canada. 2017. Guidance for Maintaining and Repairing Municipal Drains in Ontario. Version 1.1. May 23, 2017. Accessed online at: <https://www.dsao.net/images/Documents/Dart/General/Guidance-for-Maintaining-and-Repairing-Municipal-Drains-in-Ontario-May-23-2017.pdf>
- [DFO] Fisheries and Oceans Canada. 2022. Aquatic Species at Risk Maps. Available online at: <https://www.dfo-mpo.gc.ca/species-especies/sara-lep/map-carte/index-eng.html>. Accessed February 2022.
- Dobbyn, J. 1994. Atlas of the mammals of Ontario. Don Mills, Ontario. Federation of Ontario Field Naturalists.
- eBird Canada. (2021). Retrieved March 16, 2021, from eBird Canada: <http://ebird.org/content/canada/>
- [ELC] Updated ELC Catalogue. 2008. Available online: http://conservationontario.ca/events_workshops/ELC_portal/
- [ERCA] Essex Region Conservation Authority. 1994. Environmentally Significant Areas Status Update. Accessed online at: https://essexregionconservation.ca/wp-content/uploads/2018/06/EnvironmentallySignificantAreas_StatusUpdate_Lebedyk_ERCA_1994-1.pdf
- [ERCA] Essex Region Conservation Authority. 2010. Town of LaSalle Official Plan Review-Update to the Candidate Natural Heritage Area Inventory. Prepared by Essex Region Conservation Authority and G. Waldron Consulting Biologist. 440pp
- [ERCA] Essex Region Conservation Authority. 2013. Essex Region Natural Heritage System Strategy (An Update to the Essex Region Biodiversity Conservation Strategy). 319 pp. Accessed online at: https://essexregionconservation.ca/wp-content/uploads/2018/05/ERNHSS_Report_FINAL_reduced.pdf



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6 References

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Essex County. 2014. Official Plan. Approved by MMAH April 28, 2014. 114 pp. Accessed online at:
<https://www.countyofessex.ca/en/doing-business/official-plan.aspx>

Government of Canada. Species at Risk Public Registry. Online at:
<https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>.
Accessed April 2021.

Important Bird Areas Canada. 2021. Lower Detroit River Important Bird and Biodiversity Area. Retrieved
May 08, 2021, from <https://www.ibacanada.com/site.jsp?siteID=ON047>

iNaturalist 2021. Available from <https://www.inaturalist.org>. Accessed March 16, 2021.

LaSalle. 2018. Town of LaSalle Official Plan. Council Adoption May 22, 2018. County of Essex Approval
October 3, 2018. Online at: [https://www.lasalle.ca/en/build-here/resources/Final-Approved-
OP_October-2018_sml.pdf](https://www.lasalle.ca/en/build-here/resources/Final-Approved-OP_October-2018_sml.pdf)

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.

[MMAH] Ministry of Municipal Affairs and Housing. 2020. Provincial Policy Statement. Queen's Printer for
Ontario.

[MNR] Ministry of Natural Resources. 2010. Natural Heritage Reference Manual for Natural Heritage
Policies of the Provincial Policy Statement, 2005. Second Edition.

[MNR] Ministry of Natural Resources and Forestry. 2014. Significant Wildlife Habitat Mitigation Support
Tool. 533 pp.

[MNR] Ministry of Natural Resources and Forestry. 2015. Significant Wildlife Habitat Ecoregion 7E
Criterion Schedule. 39 pp.

Municipal Engineers Association. (October 2000, as amended in 2007, 2011 and 2015). Municipal Class
Environmental Assessment.

[NDMNRF] Ministry of Northern Development, Mines, Natural Resources and Forestry. 2021a. Land
Information Ontario Metadata Management Tool [Online database accessed various dates].
<https://www.javacoeapp.lrc.gov.on.ca/geonetwork/srv/en/main.home>

[NDMNRF] Ministry of Natural Resources and Forestry. 2021b. Natural Heritage Information Centre
Biodiversity Explorer Database [last accessed April 20, 2021].

[MECP] Ministry of the Environment, Conservation and Parks. 2022. Species at Risk in Ontario List.
Accessed February 2022. Online at: [https://www.ontario.ca/environment-and-energy/species-risk-
ontario-list](https://www.ontario.ca/environment-and-energy/species-risk-ontario-list)



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6 References

February 9, 2023

[OMAFRA] Ontario Ministry of Agriculture, Food and Rural Affairs. Ontario. Ag Maps. Accessed February 2022. Online at:

<https://www.lioapplications.lrc.gov.on.ca/AgMaps/Index.html?viewer=AgMaps.AgMaps&locale=en-CA>

Ontario Nature. 2019. Reptiles and Amphibians of Ontario. Ontario Reptile and Amphibian Atlas [Online database last accessed September, 2019].

<https://www.ontarioinsects.org/herp/index.html?Sort=0&area2=squaresCounties&records=all&myZoom=5&Lat=46.58&Long=-85.81>

Rowe, J.S. 1972. Forest Regions of Canada. Fisheries and Environment Canada, Canadian Forest Service, Headquarters, Ottawa. 172 p. Accessed February 2022. Online at:

<https://cfs.nrcan.gc.ca/publications?id=24040>

Stantec. 2018. Windsor/Essex Region Stormwater Management Standards Manual. Essex Region Conservation Authority. Online at: <https://essexregionconservation.ca/wp-content/uploads/2018/12/WE-Region-SWM-Standards-Manual.pdf>

[TEA] Toronto Entomologists' Association. 2021. Ontario Butterfly Atlas [web application]. Toronto, Ontario. Available online: <https://www.ontarioinsects.org/atlas/>

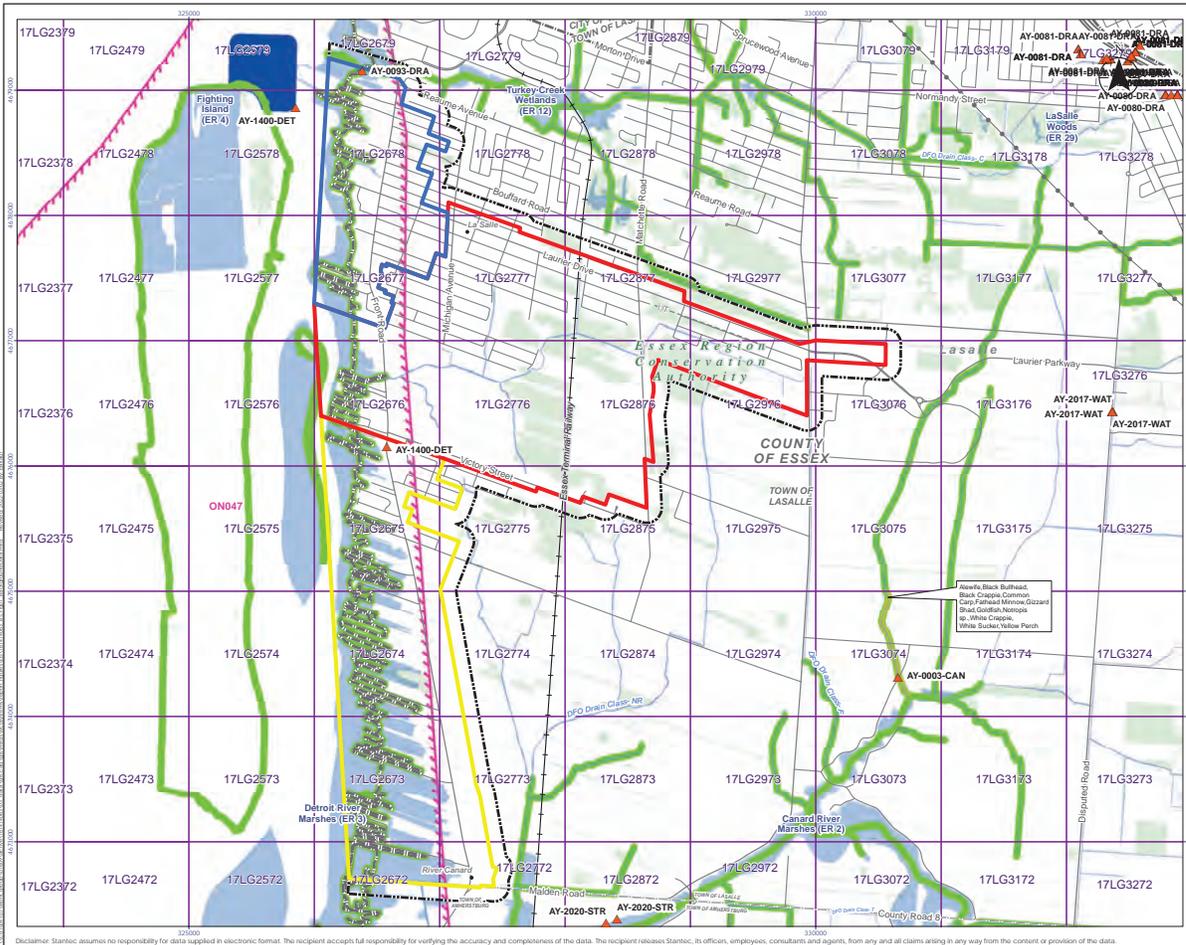


APPENDICES



Appendix A Figures





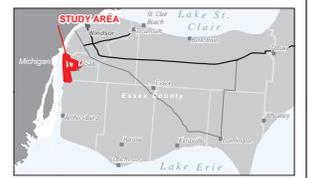
Stantec

Legend

- Study Area
- Focus Areas
 - Phase 1 Area
 - Phase 2 Area
 - Phase 3 Area
- Base Features
 - Fish Survey Point (ARA)
 - Constructed Drain
 - Thermal Regime, Warm
 - Railway
 - Hydro Line
 - Unknown Transmission Line
 - Watercourse (Permanent)
 - Conservation Area
 - Administrative Boundary
- Aquatic Species at Risk Distribution
 - Aquatic Species at Risk Critical Habitat
 - Wetland, Provincially Significant
 - Wooded Area
 - Important Bird Area
 - Lot
 - Municipal Boundary, Upper
 - Municipal Boundary, Lower
 - Unknown
 - 1 km UTM Grid

0 1 km
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Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022



Project Location: LaSalle, ON
 Prepared by CMC on 2022-03-02

Client/Project: LASALLE STORMWATER MASTER PLAN EA

Figure No.: 1
Title: Study Area and Background Data

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- Legend**
- Subject Lands
 - Study Area
 - WC-4 Watercourse Identifier
 - Constructed Drain
 - Railway
 - Watercourse (Permanent)
 - ELC Community (Stantec)
 - ELC Community (ERCA)
 - Wetland - Evaluated (Provincial)
 - Waterbody
- SAR/SOCC Species Observations**
- Bald Eagle
 - Barn Swallow
 - Northern Map Turtle
 - Turtle Species



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
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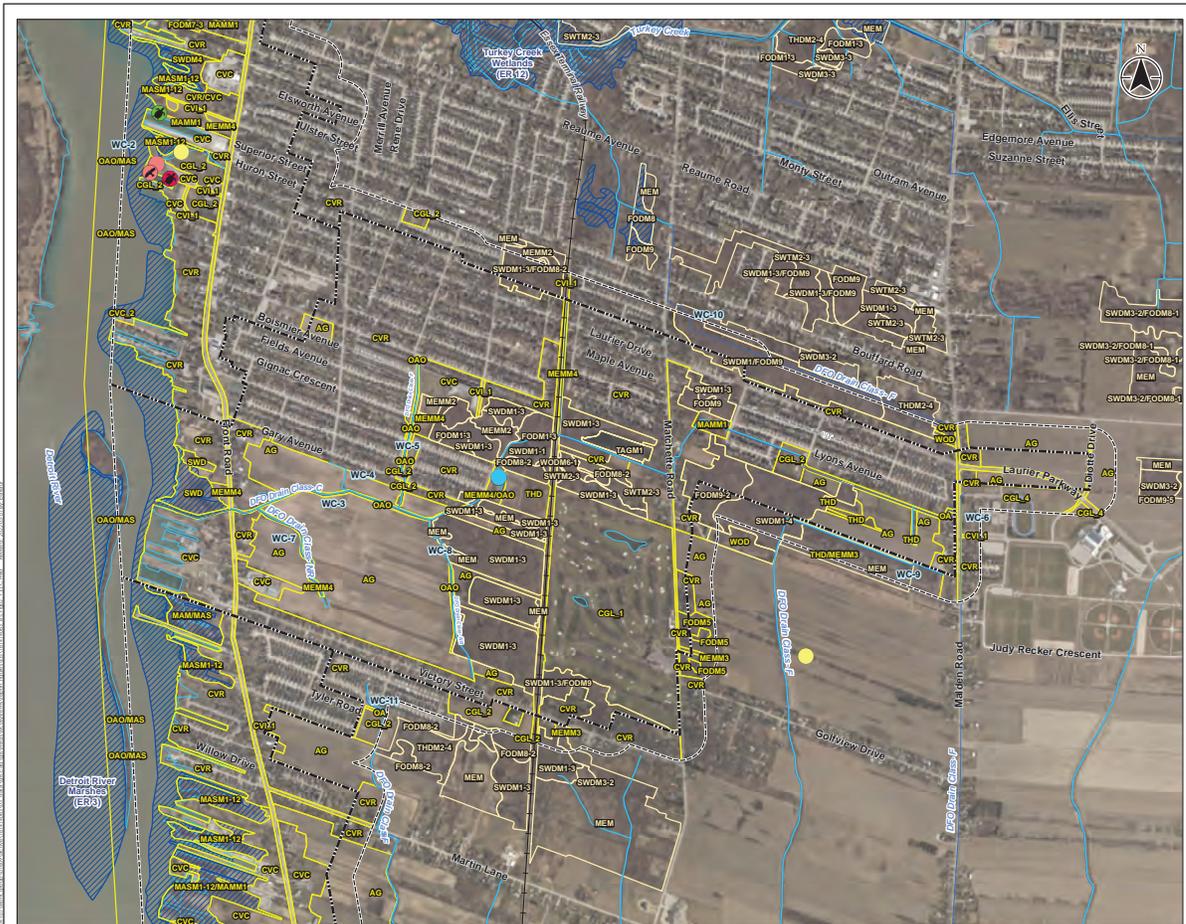


Project Location: LaSalle, ON
 Prepared by: CMC on 2022-03-07

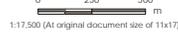
Client/Project: LASALLE STORMWATER MASTER PLAN EA

Figure No: 2.1.1
 Title: ELC Communities - Phase 1 Area

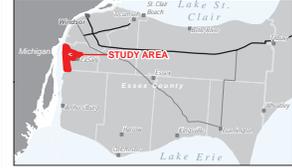
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- Subject Lands
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- Bald Eagle
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 - Northern Map Turtle
 - Painted Turtle
 - Turtle Species



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Project Location: LaSalle, ON
 Prepared by CMC on 2022-03-07

Client/Project: LASALLE STORMWATER MASTER PLAN EA

Figure No: 2.1.2
 Title: ELC Communities - Phase 2 Area

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ELC Communities

AG: Agriculture
CGL_1: Golf Course
CGL_2: Parkland
CGL_4: Recreational
CVC: Commercial and Institutional
CVC_2: Light Industry
CVI_1: Transportation
CVR/CVC: Residential/Commercial and Institutional
CVR: Residential
FODM1-3: Dry – Fresh Black Oak Deciduous Forest Type
FODM5: Dry – Fresh Sugar Maple Deciduous Forest Ecosite
FODM7-3: Fresh – Moist Willow Lowland Deciduous Forest Type
FODM7: Fresh – Moist Lowland Deciduous Forest Ecosite
FODM8-2: Fresh – Moist Sassafras Deciduous Forest Type
FODM9-2: Fresh – Moist Oak – Maple Deciduous Forest Type
FODM9: Fresh – Moist Oak – Maple – Hickory Deciduous Forest Ecosite
MAM/MAS: Meadow Marsh/Shallow Marsh
MAMM1: Graminoid Mineral Meadow Marsh Ecosite
MAS/MAM: Shallow Marsh/Meadow Marsh
MASM1-12/MAMM1: Common Reed Mineral Shallow Marsh Type/Graminoid Mineral Meadow Marsh Ecosite
MASM1-12: Common Reed Mineral Shallow Marsh Type
MASM1/MAMM1: Graminoid Mineral Shallow Marsh Ecosite/Graminoid Mineral Meadow Marsh Ecosite
MASM1: Graminoid Mineral Shallow Marsh Ecosite
MEM: Mixed Meadow
MEMM2: Fresh - Moist Mixed Tallgrass Prairie
MEMM3: Dry - Fresh Mixed Meadow Ecosite
MEMM4/OAO: Fresh - Moist Mixed Meadow Ecosite/Open Aquatic
MEMM4: Fresh - Moist Mixed Meadow Ecosite
Native Phragmites:
OA: Open Water
OAO/MAS: Open Aquatic/Shallow Marsh
OAO: Open Aquatic
SWD: Deciduous Swamp
SWDM1-1: Swamp White Oak Mineral Deciduous Swamp Type

SWDM1-3/FODM8-2: Pin Oak Mineral Deciduous Swamp Type/Fresh – Moist Sassafras Deciduous Forest Type
SWDM1-3/FODM9: Pin Oak Mineral Deciduous Swamp Type/Fresh – Moist Oak – Maple – Hickory Deciduous Forest Ecosite
SWDM1-3: Pin Oak Mineral Deciduous Swamp Type
SWDM1-4: Shumard's Oak Mineral Deciduous Swamp Type
SWDM1/FODM9: Oak Mineral Deciduous Swamp Ecosite/Fresh – Moist Oak – Maple – Hickory Deciduous Forest Ecosite
SWDM3-3: Swamp Maple Mineral Deciduous Swamp Type
SWDM4: Mineral Deciduous Swamp Ecosite
SWTM2-3: Gray Dogwood Mineral Deciduous Thicket Swamp Type
TAG: Treed Agriculture
TAGM1: Coniferous Plantation
THD/MEMM3: Deciduous Thicket/Dry - Fresh Mixed Meadow Ecosite
THD: Deciduous Thicket
THDM2-4: Dry-Fresh Gray Dogwood Deciduous Shrub Thicket Type
WOD: Deciduous Woodland
WODM6-1: Fresh – Moist Oak Tallgrass Woodland



Project Location: LaSalle, ON 161414063 REVA
Prepared by CMC on 2022-03-02

Client/Project: LASALLE STORMWATER MASTER PLAN EA

Figure No.: 2.2
Title:

ELC Legend



- Legend**
- Subject Lands
 - Study Area
 - Watercourse Identifier
 - Constructed Drain
 - Railway
 - Watercourse (Permanent)
 - Important Bird Area
 - Development Constraint
 - Waterbody



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location: LaSalle, ON 161414063 REV4
 Prepared by G.M.C. on 2022-03-07
 Technical Review by D.H. on 2022-03-02

Client/Project: LASALLE STORMWATER MASTER PLAN EA

Figure No.: 3.1
 Title: Development Constraints - Phase 1 Area

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- Legend**
- Subject Lands
 - Study Area
 - WC-4** Watercourse Identifier
 - Constructed Drain
 - Railway
 - Unknown Transmission Line
 - Watercourse (Permanent)
 - Important Bird Area
 - Development Constraint
 - Waterbody



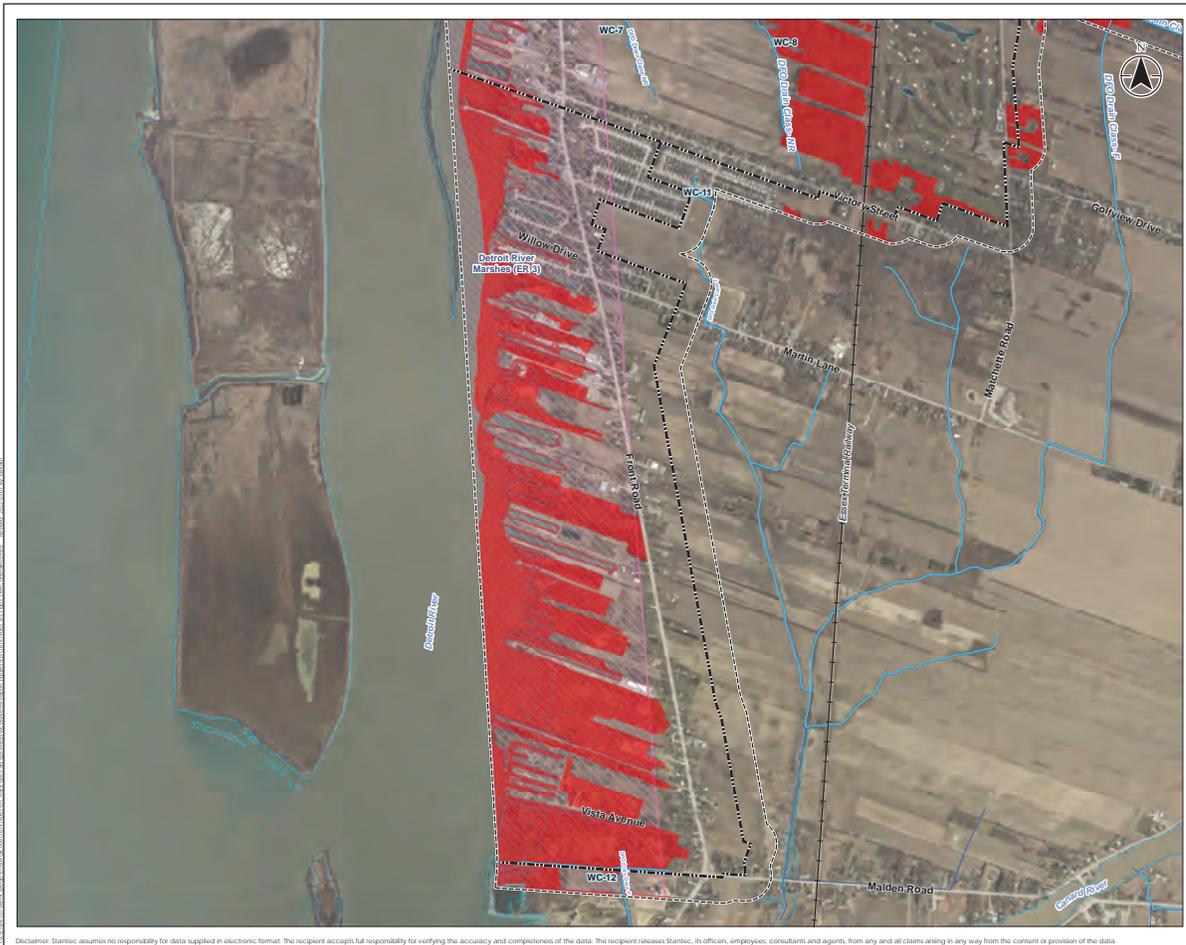
- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location: LaSalle, ON 161414063 REV4
 Prepared by G/MC on 2022-03-07
 Client/Project: LASALLE STORMWATER MASTER PLAN EA
 Technical Review by DH on 2022-03-02

Figure No.: 3.2
 Title: Development Constraints - Phase 2 Area

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- Legend**
- Subject Lands
 - Study Area
 - WC-4 Watercourse Identifier
 - Constructed Drain
 - Railway
 - Watercourse (Permanent)
 - Important Bird Area
 - Development Constraint
 - Waterbody



- Notes**
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Project Location: LaSalle, ON 161414063 REV4
 Prepared by G/MC on 2022-03-07
 Technical Review by DH on 2022-03-02

Client/Project: LASALLE STORMWATER MASTER PLAN EA

Figure No.: 3.3
 Title: Development Constraints - Phase 3 Area

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Appendix B Species at Risk and Significant Wildlife Habitat Assessment Tables



Table B-1 Species at Risk Habitat Assessment in the LaSalle Stormwater Management Master Plan Study Area

Species	Habitat Preference	Habitat Potential
PLANTS		
Butternut <i>Juglans cinerea</i>	Found in a variety of habitats throughout Southern Ontario, including woodlands and hedgerows (Farrar 1995).	Species Present. Butternut has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: FODM9-5, SWDM1-3, THD, SWDM1/FODM9, and MEM.
Black Ash <i>Fraxinus nigra</i>	The black ash is found in swampy woodlands where it can tolerate standing water for many weeks (Farrar 1995).	Species Present. Black Ash has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010).
Eastern Flowering Dogwood <i>Cornus florida</i>	Eastern flowering dogwood is an understory plant of dry to fresh deciduous and mixed forests, which frequently grows on the tops of slopes or other dry microsites, and occasionally in moister areas where no flooding occurs; preferred soils range from sand to sandy loam and clay loam (COSEWIC 2007a).	Species Present. Eastern Flowering Dogwood has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: FODM1-3 and FODM8-2.
Red Mulberry <i>Morus rubra</i>	Red Mulberry occurs in moist forests habitats including river valleys, floodplains, swales, sandspits, and slopes of the Niagara Escarpment (COSEWIC 2014).	Species Present. Red Mulberry has been identified within LaSalle through the Natural Heritage Area Inventory (Town of LaSalle, 2010). Individuals have been found in the following communities: FODM9-5.
Skinner's False Foxglove <i>Agalinis skinneriana</i>	Distribution of Skinner's False Foxglove in Canada is known from Walpole Island First Nation (WIFN) and from the City of La Salle adjacent to Windsor (COSEWIC 2010g). It's habitat within this range is mesic to moist prairies. The WIFN sites are all in tallgrass prairie sites on sandy loam (COSEWIC 2010g).	Suitable Habitat Present. Skinner's False Foxglove may occur in tallgrass prairie communities within the study area (MEMM2 and WODM6-1).
White Colicroot <i>Aletris farinosa</i>	Intolerant of shade, this species is found in small colonies or large populations in southwestern Ontario. Habitats include open moist prairie, old fields, roadsides, and edges of wooded areas with sandy soil that has a coarse texture. Colicroot flowers from Late June to late July, reproducing both from seeds and from buds that form on the underground rhizomes (Species at Risk Public Registry 2021).	Species Present. White Colicroot has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEMM2.
Scarlet Ammannia <i>Ammannia robusta</i>	In Ontario, Scarlet ammannia is found on mudflats, sand beaches, and the edges of wetlands and ponds that are seasonally flooded. Fluctuating water levels are important to its survival. It does well in habitat that is generally submerged early in the year and when water levels recede later in the summer the plants emerge (MECP 2021).	Suitable Habitat Present. Scarlet Ammannia may occur in Provincially Significant Wetland communities along Detroit River and Turkey Creek. Individuals may be present in the following communities: OAO/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1.

Table B-1 Species at Risk Habitat Assessment in the LaSalle Stormwater Management Master Plan Study Area

Species	Habitat Preference	Habitat Potential
American Chestnut <i>Castanea dentata</i>	Grows in rich mixed and deciduous forests, frequently with oak; most populations have been decimated by chestnut blight (Nixon 1997). Typical habitat is upland deciduous forest on acid to neutral, sandy soil; In Ontario, it is limited to the Carolinian Zone, where the growing season is long, temperature extremes are moderated by the lower Great Lakes and moisture is well supplied (COSEWIC, 2004a).	Suitable Habitat Present. American Chestnut may occur in deciduous forest communities within the study area (FODM1-3, FODM5, FODM9, FODM9-2).
Spotted Wintergreen <i>Chimaphila maculata</i>	Occurs in a variety of forested habitats including coniferous, mixed, and deciduous forests, as well as dry sand communities (Freeman, 2009).	Suitable Habitat Present. Spotted Wintergreen may occur in deciduous forest communities within the study area (FODM1-3, FODM5, FODM8, FODM8-1, FODM8-2, FODM9, FODM9-2, FODM9-4, FODM9-5).
Slender Bush-clover <i>Lespedeza virginica</i>	Slender bush-clover is known to be restricted to Essex County. This showy species occurs in dry savanna (especially oak), prairies, shores, fields, railroad banks and open hills. Historical records are unverified and this species is not believed to occur in Niagara (Oldham 2010). Specific habitat requirements include dry or dry-mesic sites on sandy soils, exposed mineral soil and the presence of a specific association of prairie forbs. The presence of this species may be brief in duration unless the site is exposed to some form of disturbance to maintain suitable habitat conditions (COSEWIC, 2000).	Suitable Habitat Present. Slender bush clover may occur in tallgrass prairie communities within the study area (MEMM2 and WODM6-1).
Dense Blazing-star <i>Liatris spicata</i>	Dense blazing star is typically a species of fresh to moist tall grass prairie habitats. Moisture regime may range from dry-mesic to very moist, and may be found in openings in oak savannahs, dune woodlands, interdune meadows, and along linear corridors such as roadside ditches, railways and hydro corridors (COSEWIC, 2010a).	Species Present. Dense Blazing Star has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: THDM2-4.
Purple Twayblade <i>Liparis liliifolia</i>	Purple Twayblade can be found in a variety of habitats including oak woodland and savannah, mixed deciduous forests, thicket, shrub alvar, deciduous swamp and coniferous plantations (COSEWIC 2010h).	Species Present. Purple Twayblade has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: FODM8-2, and SWDM1-3/FODM8-2.

Table B-1 Species at Risk Habitat Assessment in the LaSalle Stormwater Management Master Plan Study Area

Species	Habitat Preference	Habitat Potential
Eastern Prairie Fringed Orchid <i>Platanthera leucophaea</i>	The Eastern Prairie Fringed-orchid grows in wetlands, fens, swamps and tallgrass prairie. It has been found in ditches and railroad rights of way. In Ontario, there are about 20 small populations in prairie habitat or fens in Simcoe, Essex and Lambton counties, and the municipality of Chatham-Kent (MECP 2014).	Suitable Habitat Present. Eastern Prairie Fringed Orchid may occur in tallgrass prairie communities within the study area (MEMM2 and WODM6-1). It may also occur along the railway or within wetland communities (OAO/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1).
Pink Milkwort <i>Polygala incarnata</i>	Populations of Pink Milkwort are known from the Walpole Island First Nation (WIFN) and Ojibway Prairie Provincial Nature Reserve in Windsor (COSWEIC 2009a). It is generally found in open sand prairies with moderate to imperfect drainage (COSEWIC 2009a).	Suitable Habitat Present. Pink Milkwort may occur in tallgrass prairie communities within the study area (MEMM2 and WODM6-1). However, the population is restricted to the WIFN or Ojibway Prairie Provincial Nature Reserve in Windsor.
Willow-leaved Aster <i>Symphotrichum praealtum</i>	Over its North American range this aster is found in thickets, meadows and prairies, as well as in oak savannahs as found in the Windsor area and on Walpole Island. In Ontario it is also reported as found along railways, roadsides and old abandoned fields. Although now found in a variety of open disturbed sites, its typical prairie habitats have been historically reduced and impacted through human disturbance (COSEWIC 2003a).	Species Present. Willow-leaved Aster has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-3
BIRDS		
Bank Swallow <i>Riparia riparia</i>	The Bank Swallow excavate nests in exposed earth banks along watercourses and lakeshores, roadsides, stockpiles of soil, and the sides of sand and gravel pits. Single nests may occur, although colonies are typical and range from two to several thousand. Adjacent grasslands and watercourses are used for foraging habitat (Cadman et al., 2007).	Suitable Habitat Present. Suitable habitat may be present along watercourses throughout the study area. Targeted breeding bird surveys would be required to determine presence.
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i>	The Red-headed Woodpecker occupies a wide range of habitats, but most are characterized by open areas for feeding, snags for roosting, and a secure food supply. This species requires multiple snags for nesting, roosting, and foraging. Some of the habitats used are open deciduous and riparian woodlands, orchards, parks, agricultural lands, savanna-like grasslands, beaver ponds with snags, forest edges, burned forests, and flooded bottomland forests. Habitats are similar in both breeding and wintering range, but winter distribution most determined by presence of food. Have been known to move north in winter if mast is heavy (N.A.S., 2012; Smith et al., 2000).	Suitable Habitat Present. Suitable habitat may be present within agricultural areas, woodlands and forested areas. Targeted breeding bird surveys would be required to determine presence.

Table B-1 Species at Risk Habitat Assessment in the LaSalle Stormwater Management Master Plan Study Area

Species	Habitat Preference	Habitat Potential
Bobolink <i>Dolichonyx oryzivorus</i>	Nests primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures (COSEWIC 2010b).	Suitable Habitat Present. Suitable habitat may be present if agriculture is comprised of hayfields and pastures. Targeted breeding bird surveys would be required to determine presence.
Acadian Flycatcher <i>Empidonax virescens</i>	Its preferred breeding habitat generally consists of large mature forests and deeply wooded ravines (Friesen and Stabb, 2001). A minimum of thirty hectares 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). Due to its area sensitive nature, suitable habitat is limited in Ontario as forest cover within its breeding range is low and occurs as small, isolated patches. Other limiting factors include logging practices, invasive species, and encroachment on habitat by agriculture, residential development and utility corridors (COSEWIC, 2010c).	Habitat Absent. Suitable mature deciduous or swamp forest was absent from the Study Area.
Chimney Swift <i>Chaetura pelagica</i>	Chimney Swift use chimneys for roosting and breeding, as well as walls, rafters, or gables of buildings and, less frequently, natural structures such as hollow trees, tree cavities and cracks in cliffs (Cadman et al., 2007).	Suitable Habitat Present. Suitable habitat may be present. Chimneys or large hollow trees could be present within the Study Area. Targeted breeding bird surveys would be required to determine presence.
Eastern Meadowlark <i>Sturnella magna</i>	Meadows, hayfields and pastures; also, other open habitat types including mown lawn (COSEWIC 2011). Prefers large (~5 ha), low-lying wet grasslands with abundant litter (COSEWIC 2011).	Suitable Habitat Present. Suitable habitat may be present if agriculture is comprised of hayfields and pastures. Targeted breeding bird surveys would be required to determine presence. Eastern Meadowlark may utilize CGL_1 community within the study area.

Table B-1 Species at Risk Habitat Assessment in the LaSalle Stormwater Management Master Plan Study Area

Species	Habitat Preference	Habitat Potential
<p>Eastern Whip-poor-will <i>Antrostomus vociferus</i></p>	<p>Whip-poor-will favour open woodlands with frequent clearings. Its preferred nesting sites contain shaded leaf litter or pine needles and generally occur along wooded edges or in clearings without any herbaceous growth (Cadman et al. 2007). The species is considered to be area-sensitive, preferring 100 hectares of suitable habitat for breeding. Recent survey data suggest a substantial decline in Whip-poor-will numbers and a constriction of range, prompting its recent federal and provincial designation. Reasons for the decline are currently unknown and speculative with habitat loss and degradation, automobile collisions and changes in food supply listed as the leading threats (COSEWIC, 2009). The decline is concurrent with, and likely linked to, noted declines (and associated provincial and federal designations) of a number of aerial-foraging birds.</p> <p>Habitat loss to agricultural intensification and forest maturation is thought to be a cause of declines (Cink, 2002) but there has been no demonstration of a direct link between Whip-poor-will population decline and reductions in suitable habitat (COSEWIC, 2009).</p>	<p>Habitat Absent. Suitable woodland habitat was absent from the Study Area.</p>
<p>Yellow-Breasted Chat <i>Icteria virens</i></p>	<p>Likely never common here, most records in the province are from the Carolinian region (Eagles, 1987). The Yellow-breasted Chat prefers scrubby, early successional habitat; dense tangles of grape vine and raspberry are features of most breeding sites. Yellow-breasted Chats have been recorded in shrub thickets, woodland edges, hedgerows, regenerating abandoned fields and young coniferous plantations, and in hydro and rail rights-of-way (Cadman et al. 2007).</p>	<p>Suitable Habitat Present. Suitable habitat may be present within the following communities: THD/MEMM3, THD, THDM2-4, THDM5-1, and WOD. Targeted breeding bird surveys would be required to determine presence.</p>
MAMMALS		
<p>Little Brown Myotis <i>Myotis lucifugus</i></p>	<p>Trees, buildings and bridges for roosting; trees for nesting; caves and mines for hibernation (COSEWIC 2013).</p>	<p>Suitable Habitat Present. Candidate maternity roost trees may be present within suitable ELC communities.</p>

Table B-1 Species at Risk Habitat Assessment in the LaSalle Stormwater Management Master Plan Study Area

Species	Habitat Preference	Habitat Potential
BUTTERFLIES		
Mottled Duskywing <i>Erynnis martialis</i>	Mottled Duskywing is associated with larval food plants, which in Ontario are Prairie Root and New Jersey Tea. These plant species generally grow in dry, sandy soils within oak or pine woodlands, along roadsides, hydro corridors, riverbanks, oak savannas, shady hillside, tallgrass prairies and alvars (Linton 2015).	Suitable Habitat Present. Mottled Duskywing may occur in tallgrass prairie communities within the study area (MEMM2 and WODM6-1).
BUMBLE BEES		
Rusty-patched Bumble Bee <i>Bombus affinis</i>	The Rusty-patched bumblebee (<i>Bombus affinis</i>) occurs in diverse habitats, including mixed farmland, sand dunes, marshes, urban areas and woodlands. It has been observed feeding on a variety of plant species. Nest locations are found underground, usually in abandoned rodent burrows. The rusty-patched bumblebee's northernmost range includes southern Ontario and Southwestern Quebec in Canada, currently the only known population of Rusty-patched bumblebee in Ontario is found in Pinery provincial park (COSEWIC, 2010d).	Species absent. It is unlikely that the Rusty-patched Bumble Bee occurs outside of the Pinery Provincial Park.
FISH		
Lake Sturgeon (Great Lakes - Upper St. Lawrence River population) <i>Acipenser fulvescens</i> pop. 3	In Canada, Lake Sturgeon occur in rivers around southern Hudson Bay, in the Great Lakes, and in inland lakes and rivers from Alberta to Quebec (COSEWIC 2017a). The species inhabits a variety of aquatic ecosystem types from stepped-gradient Boreal Shield rivers, low-gradient meandering Prairie rivers, low gradient Hudson Lowland rivers and the Great Lakes and associated tributaries (COSEWIC 2017a). The limiting factor for the species is that it requires fast moving water for spawning (the base of waterfalls or a dam). A Lake Sturgeon population is known to be present in the Detroit River (COSEWIC 2017a).	Suitable Habitat Present. Habitat in the Study Area within the Detroit River may be suitable for the Lake Sturgeon.

Table B-1 Species at Risk Habitat Assessment in the LaSalle Stormwater Management Master Plan Study Area

Species	Habitat Preference	Habitat Potential
<p>Pugnose Shiner <i>Notropis anogenus</i></p>	<p>The range of the Pugnose Shiner is mostly restricted to the Great Lakes and Mississippi River drainage basins. In Canada, it has been found at multiple locations in southern Ontario.</p> <p>The species 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 (COSEWIC 2013a).</p> <p>Within the Study Area, Pugnose Shiner has been found in the Detroit River, however, populations may now only occur at the mouth of the Canard River (COSEWIC 2013a).</p> <p>Extensive sampling for Pugnose Shiner in the Detroit River failed to capture the species, however, habitat may be suitable in the Study Area.</p>	<p>Suitable Habitat Present. Habitat in the Study Area within the Detroit River may be suitable for the Pugnose Shiner. Habitat may be suitable in the wetlands at the mouth of Turkey Creek. The species is mapped as occupying habitat in the Canard River on the DFO SAR Mapping which is close to the Study Area boundary (DFO 2022).</p>
<p>Northern Madtom <i>Noturus stigmosus</i></p>	<p>In Canada, it is known only from Lake St. Clair and the Detroit, Sydenham, and Thames rivers (COSEWIC 2012). The Northern Madtom prefers habitats ranging from large creeks to big rivers, with clear to turbid water, and moderate to swift current (COSEWIC 2012). The fish occurs on bottoms of sand, gravel, and stones, occasionally with silt, detritus, and accumulated debris (COSEWIC 2012). It is sometimes associated with large aquatic plants, and is typically collected at depths of less than 7 m.</p>	<p>Suitable Habitat Present. Habitat in the Study Area within the Detroit River may be suitable for the Northern Madtom. The species is mapped as occupying habitat in the Study Area (Detroit River) on the DFO SAR Mapping (DFO 2022).</p>
<p>Pugnose Minnow <i>Opsopoeodus emiliae</i></p>	<p>In Canada, Pugnose Minnows prefer clear, slow-moving rivers, lakes and stream with abundant aquatic vegetation, but are not necessarily excluded from more turbid waters (COSEWIC 2012). Some minnows have been recorded in water bodies with moderately clear to very silty water with substrates of clay, silt or mud, moderate to abundant vegetation, and little or no current (COSEWIC 2012). One specimen was even found in turbid water devoid of vegetation.</p>	<p>Suitable Habitat Present. Habitat in the Study Area within the Detroit River, and Turkey Creek may be suitable for the Pugnose Minnow. The species is mapped as occupying habitat in the Study Area (Detroit River, Turkey Creek) on the DFO SAR Mapping (DFO 2022).</p>

Table B-1 Species at Risk Habitat Assessment in the LaSalle Stormwater Management Master Plan Study Area

Species	Habitat Preference	Habitat Potential
MOLLUSCS		
Northern Riffleshell <i>Epioblasma torulosa rangiana</i>	The Northern Riffleshell is a mussel that lives mainly in highly oxygenated riffle areas of various sized watercourses (COSEWIC 2010). Historically, it had a much greater range, including western Lake Erie, Lake St. Clair, Detroit, Thames, Ausable, and Sydenham Rivers (COSEWIC 2010). The northern riffleshell prefers to live in areas where substrates range from rocky, sandy bottoms, to firmly packed sand and fine to coarse gravel (COSEWIC 2010).	Species absent. The Detroit River population has been declared extirpated (COSEWIC 2010i).
Eastern Pondmussel <i>Ligumia nasuta</i>	In Canada, the species is only found in the delta area of Lake St. Clair (in the transition zone between wetlands and open water), in a small tributary of the upper St. Lawrence River, Lyn Creek, coastal wetlands of Lakes Erie and Ontario and several Eastern Ontario inland lakes (COSEWIC 2017b). It is believed that the Eastern Pondmussel has been lost from over 90% of its historical range in Canada to due invasion of zebra mussels (COSEWIC 2017b). The preferred habitat of the Eastern Pondmussel is sheltered areas of lakes or slow streams in substrates of fine sand and mud at depths up to 4.5 m (COSEWIC 2017b).	Species absent. Extensive range contraction has resulted in fragmented populations in Ontario. Surveys in the Detroit River over multiple years on American and Canadian sides resulted in no individuals found (COSEWIC 2017).
Threehorn Wartyback <i>Obliquaria reflexa</i>	In Canada, the species is only found in the lower Great Lakes region where it historically occurred in Lake St. Clair, the Detroit River, western Lake Erie as well as the Sydenham, Thames and Grand rivers (COSEWIC 2013b). It is now believed extirpated from the offshore waters of the Great Lakes and connecting channels, remaining only in the Sydenham, Thames, and Grand rivers (COSEWIC 2013b). Threehorn Wartyback are typically found in large rivers with moderate current and stable substrate of gravel, sand and mud (COSEWIC 2013b).	Species absent. Currently, it is believed to be extirpated from Lake St. Clair, the Canadian side of Lake Erie and the Detroit River (COSEWIC 2013). DFO SAR mapping (2022) shows the species as potentially present in the Detroit River at the south end of the Study Area, nearby the Phase 3 boundary.

Table B-1 Species at Risk Habitat Assessment in the LaSalle Stormwater Management Master Plan Study Area

Species	Habitat Preference	Habitat Potential
Kidneyshell <i>Ptychobranchnus fasciolaris</i>	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 (COSEWIC 2003b). It is rarely found in either large rivers or headwater creeks, but was historically found in low abundance on gravel shoals in Lake Erie, Lake St. Clair, Detroit and Niagara Rivers (COSEWIC 2003b). It is often found near beds of Water Willow, an aquatic plant. It is usually found deeply buried in the substrate (COSEWIC 2003b).	Species absent. Kidneyshell is considered extirpated from the Great Lakes and connecting waters, including the Detroit River (COSEWIC 2013c).
Lilliput <i>Toxolasma parvum</i>	Lilliput is found in a variety of habitats, from small to large rivers to wetlands and the shallows of lakes, ponds and reservoirs. It prefers to burrow in soft substrates (river and lake bottoms) of mud, sand, silt or fine gravel (COSEWIC 2013d). Lilliput were historically (1943-1996) known to occur in the Lake St. Clair (specifically the Sydenham, Thames, and Detroit rivers) and Lake Erie (i.e., Grand River) (COSEWIC 2013d).	Species absent. Lilliput is considered extirpated from the Detroit River (COSEWIC 2013d). DFO SAR mapping (2022) shows the species as potentially present in the Detroit River at the south end of the Study Area, nearby the Phase 3 boundary.
REPTILES		
Blanding's Turtle <i>Emydoidea blandingi</i>	Blanding's Turtles frequent lakes, ponds, and marshes, and prefer shallow water with abundant aquatic vegetation and a soft bottom (MacCulloch, 2002). They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults usually occupy open or partially vegetated sites, whereas juveniles occupy areas with thick aquatic vegetation including sphagnum, water lilies and algae. Nesting occurs in dry conifer or mixed hardwood forests, up to 410 m from any body of water, in loose substrates including sand, organic soil, gravel and cobblestone, nesting may also occur along gravel roadways (COSEWIC 2005).	Suitable Habitat Present. Blanding's Turtle may occur in Provincially Significant Wetland communities along Detroit River and Turkey Creek. Individuals may be present in the following communities: OAO/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1.

Table B-1 Species at Risk Habitat Assessment in the LaSalle Stormwater Management Master Plan Study Area

Species	Habitat Preference	Habitat Potential
<p>Spotted Turtle <i>Clemmys guttata</i></p>	<p>Spotted Turtles inhabit unpolluted habitats of slow-moving, shallow waters of ponds, bogs, fens, marshes, vernal pools and sedge meadows. Vegetation structures such as sphagnum moss, sedge tussocks, cattails, water lilies and hydrophilic shrubs, as well as soft-bottom substrates, are important components of aquatic habitats. Hibernation and Breeding grounds of the Spotted Turtle are often communal and they exhibit high fidelity to these sites. Some populations of spotted turtles will bury themselves under ground and enter a state of dormancy to avoid the heat and aridity of summer. This generally occurs in a terrestrial site and lasts from July to September, when hibernation begins (COSEWIC, 2004b).</p>	<p>Suitable Habitat Present. Spotted Turtle may occur in Provincially Significant Wetland communities along Detroit River and Turkey Creek. Individuals may be present in the following communities: OAO/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1.</p>
<p>Eastern Spiny Softshell <i>Apalone spinifera spinifera</i></p>	<p>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 2002a). 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 2002a).</p>	<p>Suitable Habitat Present. Eastern Spiny Softshell may occur in Provincially Significant Wetland communities along Detroit River and Turkey Creek. Individuals may be present in the following communities: OAO/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1.</p>
<p>Five-lined Skink (Carolinian) <i>Eumeces fasciatus</i></p>	<p>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, 2007b). 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).</p>	<p>Species absent. It is unlikely that the Five-lined Skink occurs outside of its distinct populations of Point Pelee National Park, Rondeau Provincial Park, Pinery Provincial Park, Oxley Poison Sumac Swamp, and, possibly, Walpole Island.</p>

Table B-1 Species at Risk Habitat Assessment in the LaSalle Stormwater Management Master Plan Study Area

Species	Habitat Preference	Habitat Potential
<p>Butler's Gartersnake <i>Thamnophis butleri</i></p>	<p>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).</p> <p>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, 2010e).</p>	<p>Suitable Habitat Present. Butler's Gartersnake may occur in Provincially Significant Wetland communities along Detroit River and Turkey Creek, prairie communities and disturbed areas within the study area. Individuals may be present in the following communities: MAMM1, MASM1-12, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, MASM1/MAMM1, MEMM2 and WODM6-1.</p>
<p>Queensnake <i>Regina septemvittata</i></p>	<p>The Queen snake is an aquatic snake found in rocky, gravelly, or slate stream-bed substrates, with a swift to moderate current and woodland surroundings (COSEWIC, 2010f). The Queen Snake is very rare in the province and is restricted to relatively small sections of a few rivers and wetlands in southwestern Ontario. In addition, the habitat of this species is highly specialized and it is rarely found more than 3 m from water. Wood (1949) noted the following three conditions necessary to support a large population of Queen Snakes: permanent area of water, flowing or still, with a temperature at or above 18.3C throughout most of the active season; abundant cover, such as flat rocks submerged and/or on the bank; and an abundance of crayfish.</p>	<p>Suitable Habitat Present. Queensnake may occur in Provincially Significant Wetlands along Detroit River and Turkey Creek. Individuals may be present in the following communities: OAO/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1.</p>

Table B-1 Species at Risk Habitat Assessment in the LaSalle Stormwater Management Master Plan Study Area

Species	Habitat Preference	Habitat Potential
Eastern Hog-nosed Snake <i>Heterodon platirhinos</i>	The Eastern hog-nosed snake requires a number of factors including well-drained loose or sandy soil; open vegetative cover such as open woods; brushland or forest edge; relatively close proximity to water; and climatic conditions typical of the eastern deciduous forest, they are also a wide ranging species, often with home ranges up to 100ha (COSEWIC, 2007c). Eastern Hognose requires habitat that contains an abundance of toads as prey for adults as well an adequate supply of small amphibians such as salamanders or spring peepers, to sustain hatchlings and juveniles (Schueler 1996). In Canada the Eastern hognose snake is only found in southern Ontario. It occurs in two separate areas, the Carolinian zone and in south-central Ontario, mostly on the southern part of the Canadian Shield (COSEWIC, 2007c).	Suitable Habitat Present. Eastern Hog-nosed Snake may occur in tallgrass prairie communities within the study area (MEMM2 and WODM6-1). It may also occur near wetland and woodland communities (MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, MASM1/MAMM1).
Eastern Foxsnake (Carolinian) <i>Pantherophis gloydi</i>	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).	Suitable Habitat Present. Eastern Foxsnake may occur in tallgrass prairie communities within the study area (MEMM2 and WODM6-1). It may also occur near wetland, woodland communities and drainage areas associated with agriculture (OA, OAO/MAS, MAMM1, SWDM1-3, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, MASM1/MAMM1).
Eastern Massasauga (Carolinian) <i>Sistrurus catenatus catenatus</i>	The Massasauga rattlesnake is found in four regions of Ontario, along the eastern shores of Georgian Bay, on the Bruce Peninsula, in an area near Windsor and in the Wainfleet Bog on the northeast shore of Lake Erie. Semi-open habitats are needed for cover and basking and include wet prairies, sedge meadows, old fields, peatlands, bedrock barrens and coniferous forests. Hibernation sites are often damp or water-saturated, suggesting that moisture content is important for a successful hibernation. Females are ovoviviparous, giving birth to live young in late summer (COSEWIC 2002b).	Species Absent. It is unlikely that the Eastern Massasauga would occur outside of the Ojibway Prairie Provincial Nature Reserve in Windsor.

REFERENCES

- Cadman, M. D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier. 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. (eds) Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario . Ministry of natural resources, and Ontario Nature, Toronto, xxii + 134pp
- Cink, Calvin L. 2002. Whip-poor-will (*Caprimulgus vociferus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/620> doi:10.2173/bna.620
- COSEWIC 2000. COSEWIC assessment and update status report on the slender bush-clover *Lespedeza virginica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 9 pp.
- COSEWIC [Committee on the Status of Endangered Wildlife in Canada], 2002a. 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 2002b. COSEWIC assessment and update status report on the massasauga *Sistrurus catenatus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 23 pp.
- COSEWIC 2003a. COSEWIC assessment and status report on the willowleaf aster *Symphotrichum praealtum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 16 pp.
- COSEWIC 2003b. COSEWIC assessment and status report on the kidneyshell *Ptychobranthus fasciolaris* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 32 pp.
- COSEWIC 2004a. COSEWIC assessment and status report on the American chestnut *Castanea dentata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 19 pp.
- COSEWIC 2004b. COSEWIC assessment and update status report on the spotted turtle *Clemmys guttata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 27 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- COSEWIC [Committee on the Status of Endangered Wildlife in Canada], 2005. COSEWIC assessment and update status report on the Blanding's Turtle *Emydoidea blandingii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 40 pp
- COSEWIC [Committee on the Status of Endangered Wildlife in Canada], 2007a. COSEWIC assessment and status report on the eastern flowering dogwood *Cornus florida* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa vi + 22pp. (www.sararegistry.gc.ca/status/status_e.cfm)

- COSEWIC. 2007b. 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. 2007c. COSEWIC assessment and update status report on the Eastern Hog-nosed Snake *Heterodon platirhinos* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 36 pp.
- COSEWIC, 2008. COSEWIC assessment and update status report on the Eastern Foxsnake *Elaphe gloydi*, Carolinian population and Great Lakes/St. Lawrence population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 45 pp. www.sararegistry.gc.ca/status/status_e.cfm
- COSEWIC. 2009a. COSEWIC assessment and status report on the Pink Milkwort *Polygala incarnata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Vi + 24 pp.
- COSEWIC. 2009b. COSEWIC assessment and status report on the Whip-poor-will *Caprimulgus vociferous* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Vi + 28 pp.
- COSEWIC. 2010a. COSEWIC assessment and status report on the Dense Blazing Star *Liatris spicata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 23 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- COSEWIC [Committee on the Status of Endangered Wildlife in Canada], 2010b. COSEWIC assessment and status report on the Bobolink *Dolichonyx oryzivorus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 42 pp. www.registrelep-sararegistry.gc.ca/default_e.cfm.
- COSEWIC. 2010c. COSEWIC assessment and status report on the Acadian Flycatcher *Empidonax virescens* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 38 pp.
- COSEWIC, 2010d. COSEWIC assessment and status report on the Rusty-patched Bumble Bee *Bombus Affinis* in Canada. Committee on the status of Endangered Wildlife in Canada. Ottawa. Vi + 34pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- COSEWIC. 2010e. COSEWIC assessment and status report on the Butler's Gartersnake *Thamnophis butleri* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 51 pp.
- COSEWIC. 2010f. COSEWIC assessment and status report on the Queensnake *Regina septemvittata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 34 pp.
- COSEWIC. 2010g. COSEWIC assessment and status report on the Skinner's Agalinis *Agalinis skinneriana* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 24 pp.

- COSEWIC. 2010h. COSEWIC assessment and status report on the Purple Twayblade *Liparis liliifolia* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 25 pp.
- COSEWIC. 2010i. COSEWIC assessment and status report on the Northern Riffleshell *Epioblasma torulosa rangiana* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 47 pp.
- COSEWIC [Committee on the Status of Endangered Wildlife in Canada], 2011. COSEWIC assessment and status report on the Eastern Meadowlark *Sturnella magna* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 40 pp.
- COSEWIC. 2012. COSEWIC assessment and status report on the Pugnose Minnow *Opsopoeodus emiliae* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 29 pp.
- COSEWIC. 2012. COSEWIC assessment and status report on the Northern Madtom *Noturus stigmosus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 38 pp.
- COSEWIC [Committee on the Status of Endangered Wildlife in Canada]. 2013. COSEWIC Assessment and Status Report on the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), Tri-colored Bat (*Perimyotis subflavus*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, Ontario.
- COSEWIC. 2013a. COSEWIC assessment and status report on the Pugnose Shiner *Notropis anogenus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 32 pp.
- COSEWIC. 2013b. COSEWIC assessment and status report on the Threehorn Wartyback *Obliquaria reflexa* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 58 pp.
- COSEWIC. 2013c. COSEWIC status appraisal summary on the Kidneyshell *Ptychobranhus fasciolaris* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxvi pp.
- COSEWIC. 2013d. COSEWIC assessment and status report on the Lilliput *Toxolasma parvum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 57 pp.
- COSEWIC [Committee on the Status of Endangered Wildlife in Canada]. 2014. COSEWIC assessment and status report on the Red Mulberry *Morus rubra* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 22 pp. (Species at Risk Public Registry).
- COSEWIC. 2017a. COSEWIC assessment and status report on the Lake Sturgeon *Acipenser fulvescens*, Western Hudson Bay populations, Saskatchewan-Nelson River populations, Southern Hudson Bay James Bay populations and Great Lakes-Upper St. Lawrence populations in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxx + 153 pp.

- COSEWIC. 2017b. COSEWIC assessment and status report on the Eastern Pondmussel *Ligumia nasuta* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 61 pp.
- DFO [Fisheries and Oceans Canada]. 2014. Recovery Potential Assessment of Lilliput (*Toxolasma parvum*) in Canada. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/069.
- DFO [Fisheries and Oceans Canada]. 2022. Government of Canada. Aquatic Species at Risk Map. Online: <https://www.dfo-mpo.gc.ca/species-especies/sara-lep/map-carte/index-eng.html>. Accessed February 8, 2022.
- Environment Canada. 2008. Species at risk public registry website. www.sararegistry.gc.ca. accessed August 14, 2008.
- Environment and Climate Change Canada (ECCC). 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.
- ERCA [Essex Region Conservation Authority]. 2010. Town of LaSalle Official Plan Review-Update to the Candidate Natural Heritage Area Inventory. Prepared by Essex Region Conservation Authority and G. Waldron Consulting Biologist. 440pp
- Farrar, J.L. 1995. Trees in Canada. Fitzhenry & Whiteside Limited and the Canadian Forest Service. Canada. 168 pp.
- Freeman, C. C. 2009. *Chimaphila*, In Flora of North America North of Mexico (Flora of North America Editorial Committee, eds.). New York and Oxford. Vol. 8; Retrieved from the Flora of North America Online: http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=220002765
- Friesen, Lyle and M. Stabb. 2001. Preserve Endangered Songbirds Factsheet: Acadian Flycatchers and Hooded Warblers. Bird Studies Canada. 2001.
- Linton, Jessica. 2015. Recovery Strategy for the Mottled Duskywing (*Erynnis martialis*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. v + 38 pp.
- MacCulloch, R.D. 2002. The ROM Field Guide to Amphibians and Reptiles of Ontario. Royal Ontario Museum: Toronto, ON. 168 p.
- McCracken, J.D., R.A. Reid, R.B. Renfrew, B. Frei, J.V. Jalava, A. Cowie, and A.R. Couturier, 2013. Recovery Strategy for the Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. viii + 88 pp.
- MECP [Ministry of the Environment, Conservation and Parks]. 2014. Eastern Prairie Fringed Orchid. Retrieved May 12, 2021, from <https://www.ontario.ca/page/eastern-prairie-fringed-orchid>

- MECP [Ministry of the Environment, Conservation and Parks]. 2021. Scarlet ammannia. Retrieved May 12, 2021, from <https://www.ontario.ca/page/scarlet-ammannia>
- National Audubon Society (N.A.S), 2012. Red-headed Woodpecker *Melanerpes erythrocephalus*. Available Online at: <https://www.audubon.org/field-guide/bird/red-headed-woodpecker>
- Nixon, K.C. 1997. Castanea. In Flora of North America North of Mexico (Flora of North America Editorial Committee, eds.). New York and Oxford. Vol. 3; Retrieved from the Flora of North America Online: http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=233500325
- Oldham and Brinker 2009. Rare Vascular Plants of Ontario. 4th Ed. Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario. 188 pp.
- Oldham 2010. Checklist of the Vascular Plants of Niagara Regional Municipality, Ontario. Ontario Natural Heritage Information Centre, Ministry on Natural Resources, Peterborough, ON. Prepared for the Niagara Peninsula Conservation Authority. March 2010.
- Smith, K. G., J. H. Withgott, and P. G. Rodewald. 2000. Red-headed Woodpecker (*Melanerpes erythrocephalus*). In The Birds of North America, No. 518 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- Schueler, F.W. and F.R. Cook. 1992. The status of the Eastern Hognose Snake, *Heterodon platirhinos*, in Canada. Prepared for The Committee on the Status of Endangered Wildlife in Canada. Unpublished report. 34 pp. + supplement.
- Species at Risk Public Registry. 2021. Species Profile: Colicroot. Available: <https://species-registry.canada.ca/index-en.html#/species/214-171#habitat>
- 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.
- Wood, J.T. 1949. Observations on *Natrix septemvittata* (Say) in southwestern Ohio. The American Midland Naturalist 42(3): 744-750.

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Seasonal Concentration Areas			
Waterfowl Stopover and Staging Area (Terrestrial)	Fields with sheet water or utilized by tundra swans during spring (mid-March to May), or annual spring melt water flooding found in any of the following Community Types: Meadow (CUM1), Thicket (CUT1). Agricultural fields with waste grains are commonly used by waterfowl, and these are not considered SWH unless used by Tundra swans in the Long Point, Rondeau, Lake St. Clair, Grand Bend and Point Pelee Areas.	ELC assessment was used to assess features within the Study Area that may support waterfowl stopover and staging areas (terrestrial).	No candidate habitat for Waterfowl Stopover and Staging Areas (Terrestrial) occurred within the Study Area.
Waterfowl Stopover and Staging Area (Aquatic)	The following Community Types: Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Aquatic (SA), Deciduous Swamp (SWD). Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. The combined area of the ELC ecosites and a 100 m radius area is the SWH. Sewage treatment ponds and storm water ponds do not qualify as a SWH; however, a reservoir managed as a large wetland or pond/lake does qualify.	ELC assessment was used to assess features within the Study Area that may support waterfowl stopover and staging areas (aquatic).	The Study Area is located within Lower Detroit River Important Bird Area (IBA) which recognizes globally significant congregatory species, waterfowl concentrations, colonial waterbirds/seabird concentrations, and nationally significant congregatory species including: canvasback and redhead Candidate habitat for waterfowl stopover and staging (aquatic) is present within the Study Area.
Shorebird Migratory Stopover Area	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a significant wildlife habitat. The following community types: Meadow Marsh (MAM), Beach/Bar (BB), or Sand Dune (SD).	ELC assessment was used to assess features within the Study Area that may support migratory shorebirds.	Shorelines are present within the Study Area Seasonally flooded, muddy and un-vegetated shoreline habitat occurs directly adjacent to the project area. Candidate habitat for shorebird stopover areas is present within the Study Area.

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Raptor Wintering Area	<p>At least one of the following Forest Community Types: Deciduous Forest (FOD), Mixed Forest (FOM) or Coniferous Forest (FOC), in combination with one of the following Upland Community Types: Meadow (CUM), Thicket (CUT), Savannah (CUS), Woodland (CUW) (<60% cover) that are >20 ha and provide roosting, foraging and resting habitats for wintering raptors.</p> <p>Upland habitat (CUM, CUT, CUS, CUW), must represent at least 15 ha of the 20 ha minimum size.</p>	<p>ELC assessment was used to assess features within the Study Area that may support wintering raptors.</p>	<p>The Study Area contains a suitable amount of FOD/Upland habitat and shoreline habitat.</p> <p>One Bald Eagle was observed nesting during the site visit.</p> <p>Candidate habitat for raptor wintering areas is present within the Study Area.</p>
Bat Hibernacula	<p>Hibernacula may be found in caves, mine shafts, underground foundations and karsts.</p> <p>May be found in these Community Types: Crevice (CCR), Cave (CCA).</p>	<p>ELC assessment was used to assess features within the Study Area that may support bat hibernacula.</p>	<p>No crevices, caves or abandoned mines are located within the Study Area.</p> <p>No candidate habitat for bat hibernacula occurred within the Study Area.</p>
Bat Maternity Colonies	<p>Maternity colonies considered significant wildlife habitat are found in forested ecosites.</p> <p>Either of the following Community Types: Deciduous Forest (FOD) or Mixed Forest (FOM), that have >10/ha wildlife trees >25 cm diameter at breast height (dbh).</p> <p>Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH).</p> <p>Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2.</p> <p>Northern Myotis prefer contiguous tracts of older forest cover for foraging and roosting in snags and trees.</p> <p>Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.</p>	<p>ELC assessment was used to assess features within the Study Area that may support bat maternity colonies.</p>	<p>The Study Area contains a forested community which may provide suitable Bat Maternity habitat.</p> <p>Candidate habitat for bat maternity colonies present within the Study Area, but not within the Project Footprint.</p>

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Turtle Wintering Areas	<p>Snapping and Midland Painted turtles utilize ELC community classes: Swamp (SW), Marsh (MA) and Open Water (OA). Shallow water (SA), Open Fen (FEO) and Open Bog (BOO).</p> <p>Northern Map turtle- open water areas such as deeper rivers or streams and lakes can also be used as over-wintering habitat.</p> <p>Water has to be deep enough not to freeze and have soft mud substrate.</p> <p>Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen.</p>	<p>ELC assessment was used to assess features within the Study Area that may support areas of permanent standing water but not deep enough to freeze.</p>	<p>Detroit River, Turkey Creek Marshes and Swamp habitat (OA, OAO, OAO/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1) are present within the Study Area, providing suitable wintering habitat for Snapping, Midland Painted and Northern Map Turtles.</p> <p>Numerous Midland Painted and Northern Map Turtles were observed basking during the site visit.</p> <p>Candidate habitat for Turtle Wintering area present within the Study Area.</p>
Snake Hibernacula	<p>Hibernation occurs in sites located below frost lines in burrows, rock crevices, broken and fissured rock and other natural features. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover.</p> <p>Any ecosite in southern Ontario other than very wet ones may provide habitat. The following Community Types may be directly related to snake hibernacula: Talus (TA), Rock Barren (RB), Crevice (CCR), Cave (CCA), and Alvar (RBOA1, RBSA1, RBTA1).</p>	<p>ELC surveys and wildlife assessments were used to assess features within the Study Area that may support snake hibernacula.</p>	<p>Suitable areas for snake hibernaculum may be present throughout the site.</p> <p>Potential snake hibernaculum occurs within the Study Area.</p>
Colonial-Nesting Bird Breeding Habitat (Bank and Cliff)	<p>Eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos, or barns found in any of the following Community Types: Meadow (CUM), Thicket (CUT), Bluff (BL), Cliff (CL).</p> <p>Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles.</p>	<p>ELC assessment was used to assess features within the Study Area that may support colonial bird breeding habitat.</p>	<p>No eroding banks, sandy hills, borrow pits, steep slopes and sand piles were observed within the Study Area.</p> <p>No candidate habitat for bank and cliff nesting within the Study Area.</p>

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
	Does not include a licensed/permitted Mineral Aggregate Operation.		
Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs)	<p>Identification of stick nests in any of the following Community Types: Mixed Swamp (SWM), Deciduous Swamp (SWD), Treed Fen (FET).</p> <p>The edge of the colony and a minimum 300 m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0 ha with a colony is the SWH.</p> <p>Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.</p>	ELC assessment was used to assess features within the Study Area that may support colonial bird breeding habitat (Trees/Shrubs).	<p>Stick Nest colonies may be present within the PSW.</p> <p>Potential habitat for tree/shrub colonial nesting birds occurred within the Study Area.</p>
Colonial-Nesting Bird Breeding Habitat (Ground)	<p>Any rocky island or peninsula within a lake or large river.</p> <p>For Brewer's Blackbird close proximity to watercourses in open fields or pastures with scattered trees or shrubs found in any of the following Community Types: Meadow Marsh (MAM1-6), Shallow Marsh (MAS1-3), Meadow (CUM), Thicket (CUT), Savannah (CUS).</p>	ELC assessment was used to assess features within the Study Area that may support colonial bird breeding habitat (Ground).	<p>No rocky islands or peninsulas are present within the Study Area. Islands adjacent were excluded from the Study Area.</p> <p>In southern Ontario, Brewer's Blackbird known occurrences are primarily restricted to the Bruce Peninsula; none are known to occur in the Study Area region and it is considered a "very rare irregular spring and autumn transient" (Cadman et al., 2007; Weir, 2008)</p> <p>No candidate habitat for ground colonial nesting birds occurred within the Study Area.</p>
Migratory Butterfly Stopover Areas	<p>Located within 5 km of Lake Ontario.</p> <p>A combination of ELC communities, one from each land class is required: Field (CUM, CUT, CUS) and Forest (FOC, FOM, FOD, CUP).</p> <p>Minimum of 10 ha in size with a combination of field and forest habitat present.</p>	ELC assessment was used to assess features within the Study Area that may support migratory butterfly stopover areas.	<p>The Study Area is not located within 5 km of the Lake Ontario shoreline.</p> <p>No candidate habitat for migratory butterfly stopover areas occurs within the Study Area.</p>

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Landbird Migratory Stopover Areas	The following community types: Forest (FOD, FOM, FOC) or Swamp (SWC, SWM, SWD). Woodlots must be >10 ha in size and within 5 km of Lake Ontario or Lake Erie – woodlands within 2 km of Lake Ontario are more significant.	ELC surveys and GIS analysis were used to assess features within the Study Area that may support landbird migratory stopover areas.	The Study Area is not located within 5 km of Lake Ontario or Lake Erie shoreline No candidate habitat for migratory landbird stopover areas is present within the Study Area.
Deer Winter Congregation Areas	Woodlots typically > 100 ha in size unless determined by the MNR as significant. (If large woodlots are rare in a planning area >50 ha.) All forested ecosites within Community Series: FOC, FOM, FOD, SWC, SWM, SWD. Conifer plantations much smaller than 50 ha may also be used.	No studies required as the MNR determines this habitat.	No deer winter congregation areas were identified by the MNR within the Study Area. No candidate habitat for deer winter congregation areas occurs within the Study Area.
Rare Vegetation Communities			
Cliffs and Talus Slopes	A Cliff is vertical to near vertical bedrock >3 m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris. Any ELC Ecosite within Community Series: TAO, TAS, TAT, CLO, CLS, CLT. Most cliff and talus slopes occur along the Niagara Escarpment.	ELC assessment was used to assess features within the Study Area that would be considered cliffs or talus slopes.	No cliffs or talus slopes were identified within the Study Area. No candidate wildlife habitat for cliffs or talus slopes occurs within the Study Area.
Sand Barrens	Sand barrens typically are exposed sand, generally sparsely vegetated and cause by lack of moisture, periodic fires and erosion. Vegetation can vary from patchy and barren to tree covered but less than 60%. Any of the following Community Types: SBO1 (Open Sand Barren Ecosite), SBS1 (Shrub Sand Barren Ecosite), SBT1 (Treed Sand Barren Ecosite).	ELC assessment was used to assess features within the Study Area that would be considered to be sand barrens.	No sand barrens were identified within the Study Area. No candidate wildlife habitat for sand barrens occurs within the Study Area.

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Alvars	<p>An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil.</p> <p>Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant.</p> <p>Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species.</p> <p>Vegetation cover varies from patchy to barren with a less than 60% tree cover.</p> <p>Any of the following Community Types: ALO1 (Open Alvar Rock Barren Ecosite), ALS1 (Alvar Shrub Rock Barren Ecosite), ALT1 (Treed Alvar Rock Barren Ecosite), FOC1 (Dry-Fresh Pine Coniferous Forest), FOC2 (Dry-Fresh Cedar Coniferous Forest), CUM2 (Bedrock Cultural Meadow), CUS2 (Bedrock Cultural Savannah), CUT2-1 (Common Juniper Cultural Alvar Thicket), or CUW2 (Bedrock Cultural Woodland).</p> <p>An Alvar site > 0.5 ha in size.</p>	<p>ELC assessment was used to assess features within the Study Area that would be considered to be alvar communities.</p>	<p>No alvars were identified within the Study Area.</p> <p>No candidate wildlife habitat for alvars occurs within the Study Area.</p>
Old-growth Forest	<p>Old-growth forests tend to be relatively undisturbed, structurally complex, and contain a wide variety of trees and shrubs in various age classes. These habitats usually support a high diversity of wildlife species.</p> <p>No minimum size criteria t in any of the following Community Types: FOD (Deciduous Forest), FOM (Mixed Forest), FOC (Coniferous Forest).</p> <p>Forests greater than 120 years old and with no historical forestry management was the main criteria when surveying for old-growth forests.</p>	<p>ELC assessment was used to assess features within the Study Area that would be considered to be old-growth forest communities.</p>	<p>No old growth forests were identified within the Study Area.</p> <p>No candidate wildlife habitat for old growth forests occurs within the Study Area.</p>

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Savannahs	<p>A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.</p> <p>In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).</p> <p>Any of the following Community Types: TPS1 (Dry-Fresh Tallgrass Mixed Savannah Ecosite), TPS2 (Fresh-Moist Tallgrass Deciduous Savannah Ecosite), TPW1 (Dry-Fresh Black Oak Tallgrass Deciduous Woodland Ecosite), TPW2 (Fresh-Moist Tallgrass Deciduous Woodland Ecosite), CUS2 (Bedrock Cultural Savannah Ecosite).</p>	<p>ELC assessment was used to assess features within the Study Area that would be considered to be savannah communities.</p>	<p>Tallgrass Woodland was identified within the Study Area (WODM6-1).</p> <p>Confirmed Tallgrass Deciduous Woodland occurs within the Study Area.</p>
Tall-grass Prairies	<p>A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.</p> <p>In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).</p> <p>Any of the following Community Types: TPO1 (Dry Tallgrass Prairie Ecosite), TPO2 (Fresh-Moist Tallgrass Prairie Ecosite).</p>	<p>ELC assessment was used to assess features within the Study Area that would be considered to be tall-grass communities.</p>	<p>Tall grass prairies were identified within the Study Area (MEMM2).</p> <p>Confirmed tall grass prairies occurs within the Study Area.</p>
Other Rare Vegetation Communities	<p>Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG.</p>	<p>ELC assessment was used to assess features within the Study Area that would be considered to be other rare vegetation communities.</p>	<p>No rare vegetation communities were identified within the Study Area.</p> <p>No candidate wildlife habitat for rare vegetation communities occurs within the Study Area.</p>

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Specialized Habitat for Wildlife			
Waterfowl Nesting Area	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4. Note: includes adjacency to Provincially Significant Wetlands.	ELC assessment was used to assess features within the Study Area that may support nesting waterfowl. Habitats adjacent to wetlands without standing water were not considered candidate SWH.	The upland shoreline of PSW Detroit River and Turkey Creek Marshes (OA/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1) provide habitat suitable for waterfowl nesting. A Canada Goose was observed nesting on site. Confirmed wildlife habitat for waterfowl nesting areas is present within the Study Area.
Bald Eagle and Osprey nesting, Foraging, and Perching Habitat	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. Nests located on man-made objects are not to be included as SWH (e.g., telephone poles and constructed nesting platforms). ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.	ELC surveys and Woodland Assessments were used to assess features within the Study Area that may support nesting, foraging and perching habitat for large raptors.	No large stick nests were identified within the Study Area. However, a Bald Eagle nest was observed 400m outside of the Study Area. Candidate wildlife habitat for Osprey or Bald Eagle habitat occurs within the Study Area.
Woodland Raptor Nesting Habitat	All natural or conifer plantation woodland/forest stands combined >30 ha and with >4 ha of interior habitat. Interior habitat determined with a 200 m buffer. Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	ELC surveys, Woodland Assessments and GIS analysis were used to assess features within the Study Area that may support nesting habitat for woodland raptors.	There is no woodland/forest stands combined >30 ha or >4 ha interior habitat within the Study Area. No candidate wildlife habitat for woodland raptor nesting occurs within the Study Area.

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Turtle Nesting Areas	<p>Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC Ecosites: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, BOO1, FEO1.</p> <p>Best nesting habitat for turtles is close to water, away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals.</p> <p>For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH.</p> <p>Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.</p>	<p>ELC surveys and GIS analysis were used to assess features within the Study Area that may support turtle nesting areas.</p>	<p>The following ELC communities are generally associated with potential candidate wildlife habitat for turtle nesting area and were identified within the Study Area: MAM/MAS, MAMM1.</p> <p>Hatchling Painted Turtles were observed in the MEMM4/OAO community, however this is not considered SWH.</p> <p>Candidate wildlife habitat for turtle nesting areas.</p>
Seeps and Springs	<p>Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.</p> <p>Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system</p>	<p>The presence of seeps and springs was recorded during spring and summer field investigations.</p>	<p>No seeps or springs were observed within the Study Area during roadside assessments. However, they may still occur within interior habitat.</p> <p>Candidate wildlife habitat for seeps and springs.</p>
Amphibian Breeding Habitat (Woodland)	<p>All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD.</p> <p>Presence of a wetland, lake, or pond within or adjacent (within 120 m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians.</p> <p>Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.</p>	<p>ELC assessment was used to assess features within the Study Area that may support woodland breeding amphibians.</p>	<p>The SWD community adjacent to Detroit River and Turkey Creek Marshes are likely to provide suitable habitat.</p> <p>Candidate amphibian breeding habitat (woodland) is present within the Study Area.</p>

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Amphibian Breeding Habitat (Wetland)	<p>ELC Community Classes SW, MA, FE, BO, OA and SA.</p> <p>Wetland areas >120 m from woodland habitats.</p> <p>Wetlands and pools (including vernal pools) >500 m² (about 25 m diameter) supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats.</p> <p>Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators.</p> <p>Bullfrogs require permanent water bodies with abundant emergent vegetation.</p>	<p>ELC assessment was used to identify wetland habitat features within the Study Area including those that may support bullfrogs (i.e., natural open aquatic and marsh habitats greater than 1 ha in size).</p>	<p>The shoreline of Detroit River and Turkey Creek Marshes (OAO/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1) and marsh itself provide suitable amphibian breeding habitat.</p> <p>Candidate habitat for wetland amphibian breeding is present within the Study Area.</p>
Species of Conservation Concern			
Marsh Bird Breeding Habitat	<p>All wetland habitats with shallow water and emergent aquatic vegetation.</p> <p>May include any of the following Community Types: Meadow Marsh (MAM), Shallow Aquatic (SA), Open Bog (BOO), Open Fen (FEO), or for Green Heron: Swamp (SW), Marsh (MA) and Meadow (CUM) Community Types.</p>	<p>ELC assessment was used to identify marshes with shallow water and emergent vegetation that may support marsh breeding birds.</p>	<p>The shoreline of Detroit River and Turkey Creek Marshes (OAO/MAS) and marsh itself provide suitable habitat for breeding marsh birds.</p> <p>Candidate habitat for marsh breeding birds is present within the Study Area.</p>
Woodland Area-sensitive Bird Breeding Habitat	<p>Habitats >30ha where interior forest is present (at least 200 m from the forest edge); typically >60 years old.</p> <p>These include any of the following Community Types: Forest (FO), Treed Swamp (SW)</p>	<p>ELC surveys and GIS analysis were used to determine whether woodlots that occurred within the Study Area that were >30 ha with interior habitat present (>200 m from edge).</p>	<p>No woodlots exceeded 30 ha in size within the Study Area.</p> <p>No candidate wildlife habitat for woodland area-sensitive breeding bird habitat occurs within the Study Area.</p>
Open Country Bird Breeding Habitat	<p>Grassland areas > 30 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or hay or livestock pasturing in the last 5 years, in the following Community Type: Meadow (CUM).</p>	<p>ELC surveys and GIS analysis were used to identify grassland communities within the Study Area that may support area-sensitive breeding birds.</p>	<p>No non-agricultural grassland communities >30 ha were identified within the Study Area.</p> <p>No candidate wildlife habitat for open country breeding bird habitat occurs within the Study Area.</p>

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Shrub/Early Successional Bird Breeding Habitat	Oldfield areas succeeding to shrub and thicket habitats >10 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or intensive hay or livestock pasturing in the last 5 years, in the following Community Types: Thickets (CUT), Savannahs (CUS), or Woodlands (CUW).	ELC surveys and GIS analysis were used to identify large CUT, CUS or CUW communities that may support shrub/early successional breeding birds.	Suitable communities were not identified within the Study Area. No candidate wildlife habitat for shrub/early successional breeding bird habitat occurs within the Study Area.
Terrestrial Crayfish	Meadow marshes and edges of shallow marshes (no minimum size). Vegetation communities include MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3. Construct burrows in marshes, mudflats, meadows. Can be found far from water.	ELC assessment was used to identify shallow marsh and meadow marsh communities that occurred within the Study Area.	The shoreline of Detroit River and Turkey Creek Marshes (MAMM1, MASM1-12, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1) within the Study Area may provide suitable habitat. Candidate habitat for Terrestrial Crayfish chimneys.
Special Concern and Rare Wildlife Species (i.e. all special concern and S1-S3 species)			
ODONATA			
Blue-tipped Dancer (<i>Argia tibialis</i>)	The Blue-tipped Dancer (<i>Argia tibialis</i>) is found at small wooded sandy streams with a slow to moderate current and with or without riffles, less often larger rivers (Paulson, 2009).	ELC assessment was used to assess features within the Study Area that may support this species.	Turkey Creek and drainage features may support this species.
Azure Bluet (<i>Enallagma aspersum</i>)	In southern Ontario, the Azure Bluet (<i>Enallagma aspersum</i>) has become adapted to man-made ponds and is typically found in shallow, often temporary and fishless, pools and ponds that entirely freeze in the winter (Catling and Brownell, 2000).	ELC assessment was used to assess features within the Study Area that may support this species.	Drainage features and MEMM4/O community may support this species.
Double-striped Bluet (<i>Enallagma basidens</i>)	The Double-striped Bluet (<i>Enallagma basidens</i>) is found around ponds, especially artificial ponds including pit and quarry sites, but also along rivers (Catling and Brownell, 2000).	ELC assessment was used to assess features within the Study Area that may support this species.	Drainage features and MEMM4/OA community may support this species.
Citrine Forktail (<i>Ischnura hastata</i>)	The Citrine Forktail likes marshy ponds, vernal pools, stream backwaters, seeps, and wetlands (WATRI 2021a).	ELC assessment was used to assess features within the Study Area that may support this species.	Wetland communities (OAO/MAS, MAMM1, MASM1-12, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1) throughout the Study Area may provide suitable habitat.

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Swamp Darner (<i>Epiaeschna heros</i>)	Swamp Darners (<i>Epiaeschna heros</i>) can be found near forest pools, ponds and ditches (Catling and Brownell, 2000).	ELC assessment was used to assess features within the Study Area that may support this species.	Wetland communities (OAO/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1) and drainage features throughout the Study Area may provide suitable habitat.
Pronghorn Clubtail (<i>Gomphus graslinellus</i>)	The Pronghorn Clubtail (<i>Gomphus graslinellus</i>) is found around streams, ponds and lakes (Catling and Brownell, 2000).	ELC assessment was used to assess features within the Study Area that may support this species.	Turkey Creek and Detroit River Marshes may provide suitable habitat.
Cobra Clubtail (<i>Gomphus vastus</i>)	The Cobra Clubtail can be found at large rivers with average to fast currents, and lake shores where there are alternating stretches of sand and gravel, and sometimes large streams. Brushes or thickets seem to be appreciated along the habitats listed previously (WATRI 2021b).	ELC assessment was used to assess features within the Study Area that may support this species.	Detroit River, Turkey Creek and associated lakeshore may provide suitable habitat.
Common Sanddragon (<i>Progomphus obscurus</i>)	The Common Sanddragon inhabits sand bars in small streams and shallows of wide lakes; sand-bottomed streams and rivers, and in the north, sand-bottomed lakes (WATRI 2021c).	ELC assessment was used to assess features within the Study Area that may support this species.	Habitat required for this species was not observed within the Study Area.
Elusive Clubtail (<i>Stylurus notatus</i>)	The Elusive Clubtail often likes large rivers and large lakes with sandy bottoms, sometimes also with silt and gravel (WATRI 2021d).	ELC assessment was used to assess features within the Study Area that may support this species.	Detroit River, Turkey Creek and associated lakeshore may provide suitable habitat.
Royal River Cruiser (<i>Macromia taeniolata</i>)	The Royal River Cruiser can be found at clean rivers, streams, and lakes (WATRI 2021e).	ELC assessment was used to assess features within the Study Area that may support this species.	Detroit River, Turkey Creek and associated marshes may provide suitable habitat.
Painted Skimmer (<i>Libellula semifasciata</i>)	The Painted Skimmer can be found in marshy bays, ponds, and streams (Catling and Brownell, 2000).	ELC assessment was used to assess features within the Study Area that may support this species.	Detroit River, Turkey Creek and associated marshes may provide suitable habitat.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Great Blue Skimmer (<i>Libellula vibrans</i>)	The Great Blue Skimmer prefers swamp pools or ponds and slow forest streams (WATRI 2021f).	ELC assessment was used to assess features within the Study Area that may support this species.	Swamp communities (SWDM1-4, SWD) throughout the Study Area may provide suitable habitat.
Great Spreadwing (<i>Archilestes grandis</i>)	The Great Spreadwing prefers slow small streams, often with alder or willows, wetlands, ponds and temporary pools (WATRI 2021g).	ELC assessment was used to assess features within the Study Area that may support this species.	Wetland communities (OAO/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1) throughout the Study Area may provide suitable habitat.
BUTTERFLIES			
Hoary Edge (<i>Achalarus lyciades</i>)	The Hoary Edge inhabits open, dry, sandy woodlands (Hall 2014).	ELC assessment was used to assess features within the Study Area that may support this species.	The WODM6-1 community within the study area may provide suitable habitat.
Southern Cloudywing (<i>Thorybes bathyllus</i>)	The Southern Cloudywing inhabits open, dry areas, restricted to southwestern Ontario (Hall 2014).	ELC assessment was used to assess features within the Study Area that may support this species.	The MEMM3 community within the study area may provide suitable habitat.
Sleepy Duskywing (<i>Erynnis bizo</i>)	Sleepy Duskywing (<i>Erynnis brizo</i>) 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).	ELC assessment was used to assess features within the Study Area that may support this species.	The WODM6-1 community within the study area may provide suitable habitat.
Duke's Skipper (<i>Euphyes dukesi</i>)	The Duke's Skipper inhabits woodland clearings, forest edges, ditches and along riverbanks, most important foodplants include Shoreline Sedge (<i>Carex hyalinolepis</i>) and Lake Sedge (<i>Carex lacustris</i>) (Hall 2014).	ELC assessment was used to assess features within the Study Area that may support this species.	Wetland communities (OAO/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1) and drainage features throughout the Study Area may provide suitable habitat.
Black Dash (<i>Euphyes conspicua</i>)	Boggy marshes, wet meadows, and marshy stream banks (Lotts and Naberhaus 2017).	ELC assessment was used to assess features within the Study Area that may support this species.	Wetland communities (OAO/MAS, MAMM1, SWDM1-4, MASM1-12, SWD, MAM/MAS, MAS/MAM, MASM1-12/MAMM1, and MASM1/MAMM1) throughout the Study Area may provide suitable habitat.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Oak Hairstreak (<i>Satyrium favonius</i>)	The Oak Hairstreak inhabits oak forests and pine-oak barrens, relies on oak buds and young leaves as foodplants (Hall 2014).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: WODM6-1, WOD, FODM1-3, FODM9-2, FODM9.
Hackberry Emperor (<i>Asterocampa celtis</i>)	The Hackberry Emperor is considered common at Long Point and Point Pelee where it's food source, hackberry, is abundant (Layberry, 1998). Adults can be found flying in open woodlands and roadsides where hackberry is present (Holmes et al., 1991).	ELC assessment was used to assess features within the Study Area that may support this species.	Forested communities within the study area (FODM) may provide suitable habitat where Hackberry (<i>Celtis occidentalis</i>) is present.
Tawny Emperor (<i>Asterocampa clyton</i>)	A woodland species that only occurs in southwestern Ontario and regularly at Point Pelee and Pelee Island never straying far from the larval foodplant; hackberry (Layberry, 1998).	ELC assessment was used to assess features within the Study Area that may support this species.	Forested communities within the study area (FODM/WOD) may provide suitable habitat where Hackberry (<i>Celtis occidentalis</i>) is present.
Monarch (<i>Danaus plexippus</i>)	Forage and nest in open habitat (i.e., meadows, grasslands and pastures) with various milkweed species (<i>Asclepias</i> spp.) and/or wildflowers such as goldenrods (<i>Solidago</i> spp.), asters (<i>Aster</i> spp.) and yarrow (<i>Achillea millefolium</i>) (COSEWIC 2016a).	ELC assessment was used to assess features within the Study Area that may support this species.	MEM, MEMM2, MEMM3 and MEMM4 communities may provide suitable habitat for this species.
REPTILES			
Snapping Turtle (<i>Chelydra serpentina</i>)	Snapping Turtles inhabit ponds, sloughs, streams, rivers, and shallow bays that are characterized by slow moving water, aquatic vegetation, and soft bottoms. Females show strong nest site fidelity and nest in sand or gravel banks at waterway edges in late May or early June (COSEWIC, 2008).	ELC assessment was used to assess features within the Study Area that may support this species.	Detroit River, Turkey Creek and associated marshes may provide suitable habitat.
Northern Map Turtle (<i>Graptemys geographica</i>)	Map turtles are highly aquatic and inhabit slow moving, large rivers and lakes with soft bottoms and abundant aquatic vegetation. Basking sites include rocks and deadheads adjacent to deep water (COSEWIC 2002d) Nesting occurs in soft sand or soil and at a distance from the water, hibernation is communal and occurs at the bottoms of lakes (MacCulloch, 2002). Females leave the water in June to nest (MacCulloch, 2002).	ELC assessment was used to assess features within the Study Area that may support this species.	Detroit River, Turkey Creek and associated marshes provide suitable habitat. Northern Map Turtle was observed during the April 13, 2021 field visit.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Eastern Musk Turtle (<i>Sternotherus odoratus</i>)	This species occurs in rivers, lakes and ponds with a slow current and soft bottom, and usually inhabits shallow water (Ontario Nature 2020).	ELC assessment was used to assess features within the Study Area that may support this species.	Detroit River, Turkey Creek and associated marshes may provide suitable habitat.
BIRDS			
Redhead (<i>Aythya americana</i>)	Redheads breed mainly in the seasonal ponds and other wetlands (Cadman et al., 2007).	ELC assessment was used to assess features within the Study Area that may support this species.	Breeding habitat may be suitable within the Study Area.
Caspian Tern (<i>Hydroprogne caspia</i>)	The Caspian Tern generally nests in colonies and prefers sparsely vegetated flat rocky islands, beaches, and sandy shores of James Bay and the Great Lakes in Ontario (Cuthbert and Wires, 1999). It usually nests on the more elevated areas of islands and it often found nesting with Ring-billed Gulls (Cadman et al., 2007).	ELC assessment was used to assess features within the Study Area that may support this species.	Habitat required for this species was not observed within the Study Area. May nest on the adjacent islands.
Forster's Tern (<i>Sterna forsteri</i>)	Forster's Terns inhabit freshwater, brackish, and saltwater marshes during the breeding season, when they nest in colonies around marshy edges and small islands free from predators. Some colonies nest directly on floating vegetation, others in high parts of the marsh where there is "wrack" (decaying vegetation deposited by wind or tide), and others on weedy, sandy, shelly, or pebbly beach adjacent to marshes (Cornell University 2019a).	ELC assessment was used to assess features within the Study Area that may support this species.	Detroit River, Turkey Creek and associated marshes may provide suitable habitat.
Black-crowned Night-Heron (<i>Nycticorax nycticorax</i>)	Black-crowned Night-Herons are common in wetlands across North America, including saltmarshes, freshwater marshes, swamps, streams, rivers, lakes, ponds, lagoons, tidal mudflats, canals, reservoirs, and wet agricultural fields. They require aquatic habitat for foraging and terrestrial vegetation for cover (Cornell University 2019b.)	ELC assessment was used to assess features within the Study Area that may support this species.	Detroit River, Turkey Creek and associated marshes may provide suitable habitat.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Almost always nests near water, usually on large lakes. Large stick nests are placed in trees located within mature woodlots. They usually require 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). This species has experienced a relatively recent and substantial increase in population as well as an expansion in range following a decline during the mid-20 th century (Cadman et al, 2007).	ELC assessment was used to assess features within the Study Area that may support this species.	No Bald Eagle and Osprey Nesting was identified within the Study Area. However there was an abundance of Foraging and Perching Habitat and a Bald Eagle was observed on a stick nest, outside of the study area.
Barn Swallow (<i>Hirundo rustica</i>)	Nest on walls or ledges of barns and other human-made structures such as bridges, culverts or other buildings; forages in open areas for flying insects (COSEWIC 2011a).	ELC assessment was used to assess features within the Study Area that may support this species.	Suitable habitat may be present within agricultural areas, and suitable foraging habitat is present throughout the study area. Targeted breeding bird surveys would be required to determine presence.
Short-eared Owl (<i>Asio flammeus</i>)	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 hectares of suitable habitat in order for nesting to occur.	ELC assessment was used to assess features within the Study Area that may support this species.	The combination of wetlands and agriculture within the study area may provide suitable habitat.
Peregrine Falcon (<i>Falco peregrinus</i>)	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). Despite significant recovery from population declines due to exposure to organochlorine pesticides, particularly DDT, limiting factors still include pesticide use in the species' wintering range as well as human	ELC assessment was used to assess features within the Study Area that may support this species.	Breeding habitat required for this species was not observed within the Study Area.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
	disturbance at nest sites and increased legal and illegal harvest for falconry (COSEWIC 2007).		
Eastern Wood-Pewee (<i>Contopus virens</i>)	The Eastern Wood-Pewee is a forest bird of deciduous and mixed woods. Nest-site selection favors open space near the nest, typically provided by clearings, roadways, water, and forest edges. Nests are cryptic as they are covered with lichens, typically appearing like a knot on top of a branch and little is known about nesting behavior (Cadman et al, 2007).	ELC assessment was used to assess features within the Study Area that may support this species.	Breeding habitat present within the FODM communities in the Study Area.
White-eyed Vireo (<i>Vireo griseus</i>)	In its breeding grounds, the White-eyed Vireo inhabits early to late successional habitats such as deciduous scrub, abandoned fields and pastures, regenerating logged areas, streamside thickets, the edges of forests, and reclaimed strip mines. It forages for insects and fruit in woody vegetation and is known to feed on grapes, sumac, and dogwood (NatureServe, 2015).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: THD, THD/MEMM3, THDM2-4, THDM5-1.
Wood Thrush (<i>Hylocichla mustelina</i>)	Wood Thrush prefer deciduous and mixed forests in southern Ontario, ranging from small and isolated to large and contiguous woodlots. The presence of tall trees and a thick understory are preferred (Cadman et al., 2007).	ELC assessment was used to assess features within the Study Area that may support this species.	Breeding habitat may be suitable within the forested communities of the Study Area where understory is suitable.
MAMMALS			
Eastern Mole (<i>Scalopus aquaticus</i>)	According to Dobbyn (1994), the Ontarian population is restricted to Essex County from Windsor to Point Pelee, where it relies on sandy or sandy loam soils.	ELC assessment was used to assess features within the Study Area that may support this species.	Habitat may be suitable within the Study Area in the following communities: FODM1-3, FODM4, FODM5, MEM, MEMM2, MEMM3, THDM2-4.
PLANTS			
Large-flowered Purple False Foxglove (<i>Agalinis purpurea</i> var. <i>purpurea</i>)	The Large-flowered Purple False Foxglove inhabits sandy, gravelly, and rocky shores (of Great Lakes and inland lakes and ponds) and interdunal swales, especially after lowering of water levels; fens,	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Large-flowered Purple False Foxglove has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
	sedge meadows, bogs; sand prairies and wet calcareous banks (Reznicek et al, 2011a).		found in the following communities: SWDM1, SWDM1-1, SWDM1-3, SWDM1-4, SWTM2-3.
Green Dragon (<i>Arisaema dracontium</i>)	Flowering late spring; mesic to wet deciduous woods, thickets, and bottomlands (Thompson, 2000)	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: FODM7, FODM7-3, FODM7-4, FODM8, FODM8-1, FODM8-2, FODM9, FODM9-2, FODM9-4, FODM9-5, All SWD communities, and SWTM2-3.
Kearney's Threeawn Grass (<i>Aristida longespica</i> var. <i>geniculate</i>)	Moist to dryish sandy open ground and openings in sandy prairies. Mostly associated with fossil beaches and dunes of the Great Lakes (Reznicek et al, 2011b).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEMM2.
Slim-spike Threeawn Grass (<i>Aristida longespica</i> var. <i>longespica</i>)	Moist to dryish sandy open ground and openings in sandy prairies. Mostly associated with fossil beaches and dunes of the Great Lakes (Reznicek et al, 2011b).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Slim-spike Threeawn Grass has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEMM2.
Arrowfeather Threeawn Grass (<i>Aristida purpurascens</i>)	Dry (rarely moist) usually sandy soil, prairies, sand barrens (Reznicek et al, 2011c).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEMM2.
Tall Green Milkweed (<i>Asclepias hirtella</i>)	Green Milkweed occurs in dry to moist, open, sandy soils including meadows, prairie remnants and forest edges (Reznicek et al, 2011d).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1.
Purple Milkweed (<i>Asclepias purpurascens</i>)	Dry savanna (especially oak) and thickets; shores, prairies (Reznicek et al, 2011e).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Purple Milkweed has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEMM2. May also occur in the following communities: THD, WOD, WODM6-1.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Prairie Milkweed (<i>Asclepias sullivantii</i>)	Moist prairies and relics of such habitat along roadsides and railroads (Reznicek et al, 2011f).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1.
Pawpaw (<i>Asimina triloba</i>)	Occurs on the rich moist soils of floodplains and wet woods; in colonies as an understory tree; shade-tolerant (Farrar, 1995).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: all SWD communities.
Smooth Yellow False Foxglove (<i>Aureolaria flava</i>)	Oak openings, sandy oak and oak-hickory savanna, with jack pine and aspen often present, forest borders and clearings (Reznicek et.al., 2011g).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: FODM1-3, WODM6-1.
Fern-leaved Yellow False Foxglove (<i>Aureolaria pedicularia</i>)	Oak, oak-pine, and oak-hickory savanna, including old forested dunes; transition zones between savanna and marsh; appears to be more faithful to presence of black oaks than <i>A. flava</i> is to presence of white oaks (Reznicek et.al., 2011h).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: FODM1-3, WODM6-1.
Eastern Mosquito Fern (<i>Azolla cristata</i>)	Quiet waters of swamps, ponds, lakes, and slower moving sections of streams and rivers (NHIC, 2021).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MAM/MAS, MAMM1, MAS/MAM, MASM1/MAMM1, MASM1, all SWD and SWT communities.
Yellow Wild Indigo (<i>Baptisia tinctoria</i>)	Grows in open, dry habitats; including prairies, savannahs, open woods and thickets; flowering in summer and occasionally fall (Newcomb, 1997, Argus, et.al., 1982-1987).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1.
Eastern Narrow-leaved Sedge (<i>Carex amphibola</i>)	Rare in moist woods and thickets in southwestern Ontario, usually on clay soil (NHIC 2021).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: FODM7, FODM7-3, FODM7-4, FODM8, FODM8-1, FODM8-2, FODM9, FODM9-2, FODM9-4, FODM9-5, All SWD communities, and SWTM2-3.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Yellow-fruited Sedge (<i>Carex annectens</i>)	Rare in dry prairies, open woods, and old fields in southern Ontario (NHIC 2021).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1.
Field Sedge (<i>Carex conoidea</i>)	Widespread but local in Ontario in prairies, river and lake shores (NHIC 2021).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Field Sedge has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEMM2.
Davis' Sedge (<i>Carex davisii</i>)	Occurs in rich deciduous forests and forest edges, most often along ditches and streams, forested ravines, and also thickets, meadows and fields (Ball and Reznicek, 2002).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, THD, FODM7, FODM7-3, FODM7-4, FODM8, FODM8-1, FODM8-2, FODM9, FODM9-2, FODM9-4, FODM9-5, All SWD communities, and SWTM2-3.
Mead's Sedge (<i>Carex meadii</i>)	Mead's sedge grows in open woods and cedar clearings, moist depressions, fens and in calcareous prairies (Ball and Reznicek, 2002).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, WOD, WODM6-1.
Muskingum Sedge (<i>Carex muskingumensis</i>)	Swamps (deciduous), floodplains, and swales (Reznick et.al., 2011i).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Muskingum Sedge has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWD1-3. May also occur along the Detroit river shoreline and in the following communities: all SWD communities.
Rigid Sedge (<i>Carex tetanica</i>)	Low marshy or boggy ground, meadows, shores, wet prairies and damp woodlands; often in marly places. Very local northward (Voss, 1972). Also found in seepages, fens and wet prairie habitats (Argus, et.al., 1082-1987).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, FODM7, FODM7-3, FODM7-4, FODM8, FODM8-1, FODM8-2, FODM9, FODM9-2, FODM9-4, FODM9-5, All SWD communities, and Detroit river shoreline.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Short's Sedge (<i>Carex shortiana</i>)	Moist woods and floodplains (Argus, et.al., 1082-1987).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: All FODM7, FODM8, and FODM8 communities, All SWD communities, and Detroit river shoreline.
Squarrose Sedge (<i>Carex squarrosa</i>)	Moist to wet forests and thickets, wet open depressions and wet fields and ditches. (Reznick et.al., 2011j).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, FODM7, FODM7-3, FODM7-4, FODM8, FODM8-1, FODM8-2, FODM9, FODM9-2, FODM9-4, FODM9-5, All SWD communities, and Detroit river shoreline.
Prairie Straw Sedge (<i>Carex suberecta</i>)	Fens; calcareous sedge meadows, lake shores, and wet prairies, very local (Reznick et.al., 2011k).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEMM4/OAO, MEMM2.
Pignut Hickory (<i>Carya glabra</i>)	Well-drained sandy soils, rolling hills and slopes, dry rocky soils, or thin soils on edge of granite outcrops (Stone, 1997).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Pignut Hickory has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: FODM1-3, FODM8-2, FODM9, FODM9-2.
Shellbark Hickory (<i>Carya laciniosa</i>)	Occurs on moist to wet sites, in valleys and along stream banks; mixed with other broadleaf trees (Farrar, 1995).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Shellbark Hickory has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-1, SWDM1-3, FODM8-2, FODM9.
Field Thistle (<i>Cirsium discolor</i>)	Meadows, fields, clearings, hillsides, river banks, sparsely forested sites; roadsides, vacant lots, pine plantations; doubtless originally in prairie openings (Reznick et.al., 2011l).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, THD, THD/MEMM3, THDM2-4, WOD, WODM6-1.
Tall Tickseed (<i>Coreopsis tripteris</i>)	Dry to wet prairies, meadows, marshes; oak forests, especially borders and clearings; fields, roadsides, railroads (Reznick et.al., 2011m).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Tall Tickseed has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010).

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
			Individuals have been found in the following communities: MEM, MEMM2, SWTM2-3.
Shining-branch Hawthorn (<i>Crataegus magniflora</i>)	Occurs on abandoned farmland, along streams, and in forest openings (Farrar, 1995).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Shining-branch Hawthorn has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010).
Hazel Dodder (<i>Cuscuta coryli</i>)	Parasitic on numerous hosts including species of Mentha, Euthamia, Symphyotrichum, Stachys, Ceanothus, Amphicarpaea, Solidago, Bidens, Monarda, Symphoricarpos, and Corylus (Reznick et.al., 2011n).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, SWTM2-3.
Hoary Tick-trefoil (<i>Desmodium canescens</i>)	Hoary Tick-trefoil occurs in dry to moist, open, sandy soils (Reznick et al, 2011o).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, THD, THD/MEMM3, THDM2-4, WOD, WODM6-1.
Matted Panicgrass (<i>Dichanthelium meridionale</i>)	Sandy open oak forests, drying shores, and fields (Reznick et.al., 2011p).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, THD, THD/MEMM3, THDM2-4, WOD, WODM6-1.
Early-branching Panicgrass (<i>Dichanthelium praecocius</i>)	Dry open, usually sandy ground; prairies, open oak savannas, borders and fields (Reznick et.al., 2011q).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, THD, THD/MEMM3, THDM2-4, WOD, WODM6-1.
Fall Crabgrass (<i>Digitaria cognata</i>)	Dry prairies, old fields, sandy open ground (Reznick et.al., 2011r).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, THD/MEMM3, THDM2-4, WOD, WODM6-1.
Eastern Burning Bush (<i>Euonymus atropurpureus</i>)	River banks and floodplain forests (Reznick et.al., 2011s).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Eastern Burning Bush has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-3, SWDM1-3/FODM9, SWTM2-3. Other SWD communities, and

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
			Detroit river shoreline may provide suitable habitat.
Tall Boneset (<i>Eupatorium altissimum</i>)	Along railroads and roadsides, including adjacent prairies and sedge meadows (Reznick et.al., 2011t).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Tall Boneset has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM.
Slender Fragrant Goldenrod (<i>Euthamia caroliniana</i>)	Moist or marshy sandy to mucky shores, exposed lakebeds, interdunal swales, and occasionally other moist depressions; often abundant in a distinct zone on the recently exposed shore of a softwater lake with fluctuating water levels. Occasionally in much drier habitats such as openings in dry jack pine stands (Reznick et.al., 2011u).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Slender Fragrant Goldenrod has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-3/FODM8-2, SWDM1-3, SWDM1-3/FODM9. Other SWD communities, and Detroit river shoreline may provide suitable habitat.
Pumpkin Ash (<i>Fraxinus profunda</i>)	Found in mature deciduous swamps with <i>Acer saccharinum</i> , <i>Fraxinus pennsylvanica</i> , and <i>Quercus bicolor</i> (Reznick et.al., 2011v).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Pumpkin Ash has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-3, SWDM1-3/FODM9, SWTM2-3. Other SWD communities, and Detroit river shoreline may provide suitable habitat.
Bowman's-root (<i>Gillenlia trifoliata</i>)	Open sandy woodlands and edges (NHIC, 2021).	ELC assessment was used to assess features within the Study Area that may support this species.	Presumed extirpated.
Honey Locust (<i>Gleditsia triacanthos</i>)	Occurs on moist, rich bottomlands, species is intolerant of shade (Farrar, 1995).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: FODM7-3, FODM7, FODM8-2, FODM9-2, FODM9.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Swamp Rose-mallow (<i>Hibiscus moscheutos</i>)	The Swamp Rose-mallow (<i>Hibiscus moscheutos</i>) is found only in southern Ontario, in the coastal marshes and remnant wetlands of Lakes Erie, St. Clair, and Ontario; in particular those coastal marshes which are protected by a barrier beach; it is occasionally found in open wet woods, thickets and drainage ditches in a few inland areas (COSEWIC, 2004).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MAM/MAS, MAMM1, MAS/MAM, MASM1-12/MAMM1, MASM1/MAMM1, MASM1, OAO/MAS.
American Alumroot (<i>Heuchera americana</i>)	Deciduous forests, often on dry to moist banks and ravines (Rezniek et.al., 2011w).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. American Alumroot has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: FODM8-2, SWDM1-3/FODM8-2.
Appendaged Waterleaf (<i>Hydrophyllum appendiculatum</i>)	Appendaged water-leaf is found in rich deciduous forests, especially in moist areas and ravines. (Rezinicek et al. 2011x).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: FODM7-3, FODM7, FODM8-2, FODM9-2, FODM9.
False St. John's-wort (<i>Hypericum gentianoides</i>)	Moist to dry open ground, usually on bare soil; sandy clearings. Most common sandy areas formed by old lake plains (Rezniek et.al., 2011y).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, THD, THD/MEMM3, THDM2-4, WOD, WODM6-1.
Shrubby St. John's-wort (<i>Hypericum prolificum</i>)	Swamp borders, thickets, meadows, fields, roadsides, sandy open forests (oak); in drier sites generally than <i>Hypericum kalmianum</i> , often in successional shrubby fields (Rezniek et.al., 2011z).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, THD, THD/MEMM3, THDM2-4, WOD, WODM6-1, borders of all SWD communities.
Eastern Yellow Stargrass (<i>Hypoxis hirsute</i>)	Prairies, meadows, dry open sandy woods, and alvar woodland, primarily in the Carolinian Zone, though east to Hastings County (NHIC, 2021).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Eastern Yellow Stargrass has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Sharp-fruited Rush (<i>Juncus acuminatus</i>)	Sharp-fruited rush is found in wet soil in lowland forests, meadows, and shorelines (Gleason and Cronquist, 1991).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM4, FODM7-3, FODM7, FODM8-2, FODM9-2, FODM9.
Greater Poverty Rush (<i>Juncus antheratus</i>)	Moist to seasonally dry sandy prairies, sandy fields, and borrow pits (Reznick et.al., 2011aa).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Eastern Yellow Stargrass has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2, MEMM3, MEMM4.
Two-flowered Rush (<i>Juncus biflorus</i>)	Wet open often sandy ground, ditches, swales, wet prairies (Reznick et.al., 2011ab).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Two-flowered Rush has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2.
Short-fruited Rush (<i>Juncus brachycarpus</i>)	Very local in moist, sandy meadows and swales (Reznick et.al., 2011ac).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM4, borders of all drains and forested areas.
Greene's Rush (<i>Juncus greenei</i>)	Moist to dry sandy open ground: shores, swales, fields, clearings, dunes, and interdunal depressions (Reznick et.al., 2011ad).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, borders of all drains and forested areas.
Grass-leaved Rush (<i>Juncus marginatus</i>)	Very local: wet depressions, sandy edges of marshes, sandy lake margins, and other sandy, moist open sites (Reznick et.al., 2011ae).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, borders of marshy areas MAM/MAS, MAMM1, MAS/MAM, MASM1-12/MAMM1, MASM1/MAMM1, MASM1.
Two-flowered Dwarf-dandelion (<i>Krigia biflora</i>)	Savannas, especially oak or jack pine, sometimes spruce, often in moist ground and on banks and borders; fens, wet meadows (Reznick et.al., 2011af).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Two-flowered Dwarf-dandelion has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEMM2, WODM6-1.

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Hairy Pinweed (<i>Lechea mucronate</i>)	Found in dry or sandy soil in open forests and fields (Gleason and Cronquist, 1991).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM4, WOD, WODM6-1.
Leggett's Pinweed (<i>Lechea pulchella</i>)	Dry to moist sandy plains, ridges, shores, and open forests (Reznick et.al., 2011ag).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Leggett's Pinweed has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2, WODM6-1.
Rough Blazing-star (<i>Liatris aspera</i>)	Rough Blazing Star is found in mixed wood plains, in woodlands with 35-60% cover, prairie, meadows, and fields (Evergreen, 2000-2014).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM4, WOD, WODM6-1.
Hoary Puccoon (<i>Lithospermum canescens</i>)	Sandy prairie remnants; openings in oak and jack pine savanna; edges of forests, roads, and railroads (Reznick et.al., 2011ah).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM4, WOD, WODM6-1.
Bushy Seedbox (<i>Ludwigia alternifolia</i>)	Marshy ground, borders of swamps, wet thickets, shores, clearings; usually in sandy, acidic soils (Reznick et.al., 2011ai).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Bushy Seedbox has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-3/FODM8-2, THDM2-4, MEMM2.
Many-fruited Seedbox (<i>Ludwigia polycarpa</i>)	Marshy and swampy ground; ditches and sandy excavations; wet places railroads (Reznick et.al., 2011aj).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Many-fruited Seedbox has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-3, SWDM1-3/FODM8-2, THDM2-4, MEMM2.
Sundial Lupine (<i>Lupinus perennis</i>)	The sundial Lupine's habitat is found in dry, open forests and clearings (Gleason and Cronquist, 1991).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM4, WOD, WODM6-1.

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Stalked Water-horehound (<i>Lycopus rubellus</i>)	Swamps and floodplains, less often in open moist ground (Reznick et.al., 2011ak).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Stalked Water-horehound has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-3, SWDM1-1, FODM8-2.
Winged Loosestrife (<i>Lythrum alatum</i>)	Shores and wet meadows, wet prairies, marshy ground, moist sandy openings (Reznick et.al., 2011al).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Winged Loosestrife has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-3, SWDM1-1, SWEDM3-2, FODM8-2, SWTM2-3 THDM2-4, MEM, MEMM2.
Scarlet Beebalm (<i>Monarda didyma</i>)	Scarlet beebalm (Monarda didyma is found in mesic thickets and woods (Gleason and Cronquist, 1991). This species flowers in the summer and fall in moist rich soils (Newcomb, 1977).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM4, WOD, WODM6-1.
American Lotus (<i>Nelumbo lutea</i>)	Marshes and river margins in southwestern Ontario (Argus et al. 1982-1987).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: OAO/MAS, MAM/MAS, MAMM1, MAS/MAM, MASM1-12/MAMM1, MASM1/MAMM1, MASM1, MEMM4/OAO.
Large Yellow Pond-lily (<i>Nuphar advena</i>)	Lakes, ponds, river margins, streams (Reznick et.al., 2011am).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Large Yellow Pond-lily has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: OA, OAO, OAO/MAS, MEMM4/OAO.
Black Gum (<i>Nyssa sylvatica</i>)	Black-gum is considered rare in Canada and occurs in Ontario north of Lake Erie, present as an understory tree on low, wet ground along streams or in swamps, it is moderately shade-tolerant and occasionally planted as an ornamental (Farrar,1995).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Black Gum has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-3/FODM8-2. May also occur in other SWD communities and along drains or the Detroit River.

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Biennial Gaura (<i>Oenothera gaura</i>)	River banks, roadsides, fields, vacant lots (Rezniek, et.al. 2011an).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Biennial Gaura has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2. May also occur along drains or the Detroit River.
Stiff Cowbane (<i>Oxypolis rigidior</i>)	Moist woods, especially with tamarack (and poison sumac); marshes, fens, and wet (rarely dry) prairies; swampy streamside thickets and shores (Rezniek et.al., 2011ao).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Stiff Cowbane has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-3, SWDM1-1, SWDM3-2, SWDM1-3/FODM9, SWTM2-3, FODM9, THDM2-4, MEMM2. May also occur along drains or the Detroit River.
Slender Paspalum (<i>Paspalum setaceum</i>)	Grows in sandy open ground, fields and oak woodlands, some populations have been located along weedy roadsides and may be introduced (Voss, 1972, Argus, et.al., 1982-1987).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1.
Woodland Bluegrass (<i>Poa sylvestris</i>)	Rich deciduous forests (Rezniek et.al., 2011ap).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: FODM7, FODM7-3, FODM8-2, FODM9, FODM9-2.
Blood Milkwort (<i>Polygala sanguinea</i>)	Dry to moist, often sandy fields, excavations, and borders of marshes. (Rezniek et.al., 2011aq).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1 and boarders of marsh communities (MAM, MAS).
Slender Knotweed (<i>Polygonum tenue</i>)	Dry sandy open ground on hills and old fields, borders of oak forests, rarely in heavily disturbed sites as along roadsides (Rezniek et.al., 2011ar).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1.
Slender Mountain-mint (<i>Pycnanthemum tenuifolium</i>)	Quite local, in sandy fields, moist meadows, grassy areas, and wet prairies (Rezniek et.al., 2011as).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Hairy Mountain-mint (<i>Pycnanthemum verticillatum</i> var. <i>pilosum</i>)	Moist sandy shores, fields, roadsides, and borrow pits (Reznick et.al., 2011at).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1.
Shumard Oak (<i>Quercus shumardii</i>)	Swamps, often on clay soils, mostly on the Lake Erie and Lake St. Clair lakeplain (Reznick et.al., 2011au).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Shumard Oak has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-1, SWDM3-2, SWDM1-3/FODM9, SWDM1-4, FODM9-2.
Bristly Buttercup (<i>Ranunculus hispidus</i>)	Wet areas in forests and thickets along streams, ponds, and lakes, as well as ravines and in deciduous or cedar swamps. (Reznick et.al., 2011av).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Bristly Buttercup has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-1, SWDM3-2, SWDM1-3/FODM9, SWDM1-4, SWDM1-3/FODM8-2, FODM9.
Gray-headed Prairie Coneflower (<i>Ratibida pinnata</i>)	Occurs in or near prairie remnants (including roadsides and fencerows), at margins of swamps, and in dry open ground. (Reznick et al 2011b).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Gray-headed Prairie Coneflower has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2, WODM6-1.
Climbing Prairie Rose (<i>Rosa setigera</i>)	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).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Climbing Prairie Rose has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-1, SWDM1-3, SWDM1-4, SWDM1-3/FODM8-2, SWDM1/FODM9, SWDM1-3/FODM9, SWDM3-2, FODM8-2, FODM9, FODM9-2, SWTM2-3, MEM, MEMM2, WODM6-1.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Few-flowererd Nutrush (<i>Scleria pauciflora</i>)	Dry sandy or gravelly open ground such as dry prairies and barrens (Rezniek et.al., 2011aw).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1.
Tall Nutrush (<i>Scleria triglomerata</i>)	Dry or moist open or shaded sandy ground such as prairies or open borders of marshes; very local (Rezniek et.al., 2011ax).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Tall Nutrush has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2.
Veined Skullcap (<i>Scutellaria nervosa</i>)	Moist forests, especially near streams (Rezniek et.al., 2011ay).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: FODM7-3, FODM7, FODM8-2, FODM9-2, FODM9.
Cup Plant (<i>Silphium perfoliatum</i>)	Occurs naturally on river banks and sedge dominated or wet prairie openings in floodplain forests. Also found in sedge meadows and marshes. Cup plant is popular in cultivation and plants of fields, an abandoned orchard, railroad embankments, and such places are probably not native there. (Reznicek et al 2011az).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEMM2, MEMM4, FODM7-3, FODM7, FODM8-2, FODM9-2, FODM9, all MAM and MAS communities.
Prairie Rosinweed (<i>Silphium terebinthinaceum</i>)	Calcareous places; prairies and similar grassy habitats (even conspicuous along roadsides), fens, railroad embankments. (Rezniek et.al., 2011ba).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Prairie Rosinweed has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2.
White Blue-eyed-grass (<i>Sisyrinchium albidum</i>)	Dry often sandy open fields, prairies, railroad embankments, oak-hickory forests; grassy, sometimes moist banks, shores, and pastures, even somewhat marshy ground (Rezniek et.al., 2011bb).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. White Blue-eyed-grass has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2, WODM, WODM6-1, SWDM1-3/FODM8-2.

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Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Upright Carrionflower (<i>Smilax ecirrata</i>)	Rich deciduous forests, moist forests and thickets along river banks and floodplains, oak and oak-hickory forests (Reznick et al., 2011bc).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Upright Carrionflower has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: FODM9, FODM9-2, SWDM1-3, SWDM1-4, SWDM3-2, SWDM1-3/FODM8-2, SWDM1-3/FODM9, SWTM2-3.
Illinois Carrionflower (<i>Smilax illinoensis</i>)	Forests and thickets, on floodplains and river banks, under oaks, and in rich deciduous forests (Reznick et al., 2011bd).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Illinois Carrionflower has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: FODM9, FODM9-2, SWDM1-3, SWDM1-4, SWDM3-2, SWDM1-3/FODM8-2, SWDM1-3/FODM9, SWTM2-3.
Riddell's Goldenrod (<i>Solidago riddellii</i>)	Wet prairie-like and marshy sites (Semple and Cook, 2006).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEMM2, MEMM4, all MAM and MAS communities.
Eastern Stiff-leaved Goldenrod (<i>Solidago rigida</i> ssp. <i>rigida</i>)	Dry, open ground, particularly in prairie remnants in southwestern Ontario (Argus et al. 1982-1987). Occasionally along roadsides and railways and sometimes planted in prairie restorations.	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Eastern Stiff-leaved Goldenrod has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2.
Great Plains Ladies'-tresses (<i>Spiranthes magnicamporum</i>)	Fens and prairies (Sheviak and Brown, 2002). Variable, but often associated with calcareous soils: dry or wet prairie, interdunal soils, riverbanks and floodplains (Natureserve, 2020).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Great Plains Ladies'-tresses has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2.
Skunk Meadow-rue (<i>Thalictrum revolutum</i>)	Occurs in moist and lightly shaded areas along streams, rivers, and meadows (Reznick et al., 2011be).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Skunk Meadow-rue has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: SWDM1-1, SWDM1-3, SWDM1-3/FODM9, FODM8-2.

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Purple Meadow-parsnip (<i>Thaspium trifoliatum</i>)	Oak-hickory and oak forests and forest edges, sometimes in moister forests and thickets; occasionally in prairie remnants (Reznicek et al., 2011bf).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1, FODM1-3, FODM9.
Ohio Spiderwort (<i>Tradescantia ohioensis</i>)	Ohio spiderwort occurs in dry sites along roadsides and railroads, in open oak forests, forest edges, sandy ridges. Diploid species can also occur in meadows and wet ground in addition to dry places (Reznicek et al., 2011bg).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Ohio Spiderwort has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1, FODM1-3, FODM9.
Clinton's Clubrush (<i>Trichophorum clintonii</i>)	Dry hillsides and banks; open sandy meadows and openings in oak and pine forest; very local (Reznicek et al., 2011bh).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1, FODM1-3, FODM9.
Perfoliate Horse-gentian (<i>Triosteum perfoliatum</i>)	In forests of beech and maple, oak and hickory, or pine; also in marshy ground and grassy areas (Reznicek et al., 2011bi).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1, FODM1-3, FODM5, FODM9.
Giant Ironweed (<i>Vernonia gigantea</i>)	Occurs in wet woods, thickets, and meadows, and tends to be weedy in pastures (Reznicek et al., 2011bj; Gleason and Cronquist, 1991).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Giant Ironweed has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1, FODM1-3, FODM9, FODM9-2, SWDM1-3/FODM8-2, SWDM3-2.
Missouri Ironweed (<i>Vernonia missurica</i>)	River bottom (rarely upland) forests; wet prairies, fens, sedge meadows; moist or dry open ground, river banks, fencerows, fields, roadsides (Reznicek, et. Al., 2011bk).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1, FODM1-3, FODM9, FODM9-2, SWDM1-3/FODM8-2, SWDM3-2.

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Culver's Root (<i>Veronicastrum virginicum</i>)	Dry to moist upland forests and prairies (Gleason and Cronquist, 1991).	ELC assessment was used to assess features within the Study Area that may support this species.	Species Present. Culver's Root has been identified within LaSalle through the Natural Heritage Area Inventory (ERCA 2010). Individuals have been found in the following communities: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1, FODM1-3, FODM5, FODM8-2, FODM9, FODM9-2.
Northern Fox Grape (<i>Vitis labrusca</i>)	Thickets, forests, fields, meadows, fencerows, sandy hills, rail-road embankments (Reznicek et al., 2011b).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, THD/MEMM3, THD, THDM2-4, WODM6-1, FODM5, FODM8-2, FODM9, FODM9-2.
INSECTS AND TERRESTRIAL MOLLUSCS			
Two-spotted Cobweaver (<i>Asagena americana</i>)	May be vulnerable or imperiled. Regional experts (Env Canada workshop 2010) consider this species in southeastern Ontario to be genuinely rare and range restricted, where it occurs at the extreme northern edge of its global range (NHIC 2022b).	ELC assessment was used to assess features within the Study Area that may support this species.	This species may occur throughout the site.
Short-winged Green Grasshopper (<i>Dichromorpha viridis</i>)	This species is relatively abundant in Ojibway Prairie (Windsor) and occurs in several other localities in Essex County. It apparently feeds on grasses. This is a Carolinian fringe species whose northern limit is reached in southwestern Ontario - Paiero and Marshall 2006).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, THD/MEMM3, THD, THDM2-4, WODM6-1.
Furrowed Glyph <i>Glyphyalinia luticola</i>	This species is usually found in floodplain and swamp forests under leaf litter or on bare mud as well as in anthropogenic habitats (Hubricht, 1985). Most sites where <i>Glyphyalinia luticola</i> occurs have high to moderately high soil pH and the species appears to be an acidophile (Nekola, 2010).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: all SWD, all MAM and FODM7, FODM7-3.
Reversed Haploa (<i>Haploa reversa</i>)	In Canada, Reversed Haploa Moth has been recorded from oak woodland, oak savanna, and/or sand dune habitats. The species has been recorded within a large oak woodland rural residential property in Walsingham, in oak	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1.

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
	woodland in London, and within an oak woodland and sand dune habitat cottage property in Port Franks (COSEWIC 2019).		
Differential Grasshopper (<i>Melanoplus differentialis</i>)	Restricted to southwestern Ontario where it can be locally extremely abundant in late summer and fall. It appears to prefer moist meadows and areas adjacent to bodies of water. Large populations in several parks and conservation areas (Paiero and Marshall 2006).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: MEM, MEMM2, MEMM3, MEMM4, WOD, WODM6-1, Communities adjacent To Drains and the Detroit River.
Orangewing Moth (<i>Mellilla xanthometata</i>)	Larvae feed on <i>Gleditsia triacanthos</i> (Cotinis 2017).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: FODM7-3, FODM7, FODM8-2, FODM9-2, FODM9.
White-banded Crab Spider (<i>Misumenoides formosipes</i>)	May be vulnerable or imperiled. Regional experts (Env Canada workshop 2010) consider this species in southern Ontario to be genuinely rare and existing at the northern edge of its global range (NHIC 2022b).	ELC assessment was used to assess features within the Study Area that may support this species.	This species may occur throughout the site.
<i>Parancistrocerus perennis</i> (A species of stinging wasp)	Nests in hollow twigs, especially sumac (Buck et al. 2008).	ELC assessment was used to assess features within the Study Area that may support this species.	This species may occur throughout the site.
Slender Walker (<i>Pomatiopsis lapidaria</i>)	Despite its semi-aquatic characteristics, <i>P. lapidaria</i> is usually found out of water on mud or debris near wetlands and streams, and in riparian forest, sometimes more than 100 meters from permanent water. Colonies among leaf litter and rocks can be dense, and they appear to favor calcium-rich habitats (Hotopp 2013).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: FODM7-3, FODM7, all MAM and MAS communities.
Cicada Killer (<i>Sphecius speciosus</i>)	Forest edges, gardens, waste places; nests in the ground (Borror & White 1998).	ELC assessment was used to assess features within the Study Area that may support this species.	May occur within the Parkland habitat in the surrounding Study Area.

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
Black Purseweb Tarantula (<i>Sphodros niger</i>)	Regional experts (Env Canada workshop 2010) consider this species to be vulnerable in ON and a candidate for COSEWIC consideration (NHIC 2022b).	ELC assessment was used to assess features within the Study Area that may support this species.	This species may occur throughout the site.
Bristled Slitmouth (<i>Stenotrema barbatum</i>)	It occurs in mesic forests in floodplains under leaf litter and log structure; sometimes in the uplands (Dourson 2010).	ELC assessment was used to assess features within the Study Area that may support this species.	The following communities within the study area may provide suitable habitat: FODM7-3, FODM7, all SWD communities.
Widow Yellowjacket (<i>Vespa vidua</i>)	Nests are usually subterranean; they rarely are built in decaying logs or anthropogenic structures (Buck 2008).	ELC assessment was used to assess features within the Study Area that may support this species.	This species may occur throughout the site.
FISH			
Chestnut Lamprey (Great Lakes - St. Lawrence population) (<i>Ichthyomyzon castaneus</i> pop. 1)	Prefers small to large lakes and in creeks to large rivers. Preferred substrates include sand, silt and aquatic vegetation but can also be found in areas with cobble and gravel (COSEWIC 2010). Likely requires soft substrates for burrowing young (ammocoetes).	Background/online data collection and aquatic habitat assessment.	Suitable habitat is present within the Study Area in the Detroit River. An adult Chestnut Lamprey was captured in the Detroit River in 2004 (COSEWIC 2010).
Silver Lamprey (Great Lakes - Upper St. Lawrence populations) (<i>Ichthyomyzon unicuspis</i> pop. 1)	Silver Lamprey spawn in riffle sections of rivers and streams (COSEWIC 2011b). Silver Lamprey ammocoetes live in burrows in soft stream substrate, composed of silt and sand. After metamorphosis, juveniles live within the stream of birth or migrate to larger bodies of water to complete their parasitic phase (COSEWIC 2011b).	Background/online data collection and aquatic habitat assessment.	Suitable habitat is present within the Study Area in the Detroit River. Detroit River is mapped as occupied habitat for the Silver Lamprey on the DFO SAR map (DFO 2022).
Northern Sunfish (Great Lakes - Upper St. Lawrence population) (<i>Lepomis peltastes</i> pop. 2)	Northern Sunfish is most often found in shallow areas of warm lakes, ponds, and watercourses with little current (COSEWIC 2016b). Vegetation is frequently present. Northern Sunfish is usually found in clear waters and is intolerant of turbidity and siltation. Substrate usually consists of sand and gravel and nursery areas consist of shallow	Background/online data collection and aquatic habitat assessment.	Suitable habitat is present within the Study Area in the Detroit River, Turkey Creek, and the inlet for the Marentette Drain. These watercourses are mapped as occupied habitat for the Northern Sunfish on the DFO SAR map (DFO 2022).

Table B-2 Wildlife Habitat Assessment and SOCC in the LaSalle Stormwater Management Master Plan Study Area

Candidate Wildlife Habitat	Criteria	Methods	Habitat Assessment of Features Found Within the Study Area
	areas with mixed vegetation and mineral substrate (COSEWIC 2016b).		
Channel Darter (<i>Percina copelandi</i>)	The Channel Darter inhabits river and lake habitats. Channel Darter live in small to large rivers with moderate current and clean coarse (sand, gravel) substrates. In Lakes, the species lives in nearshore habitat with coarse substrates and moderate wave action (COSEWIC 2016c). Channel Darter populations in Canada are discontinuous and declining (COSEWIC 2016c), however, low numbers of Channel Darter have been captured in the Detroit River (COSEWIC 2016c).	Background/online data collection and aquatic habitat assessment.	Suitable Habitat Present. Habitat in the Study Area within the Detroit River may be suitable for the Channel Darter. The species is mapped as occupying habitat in the Study Area (Detroit River) on the DFO SAR Mapping (DFO 2022).
Spotted Sucker (<i>Minytrema melanops</i>)	The spotted sucker usually inhabits long deep pools of small to medium-sized rivers over clay, sand or gravel substrates (COSEWIC 2005). It has also been collected from a variety of other habitats including large rivers, oxbows and backwater areas, impoundments and small turbid creeks (COSEWIC 2005).	Background/online data collection and aquatic habitat assessment.	Suitable habitat is present within the Study Area in the Detroit River, Turkey Creek, and the inlet for the Marentette Drain up to Front Road. All these waterbodies are mapped as occupied habitat for the Spotted Sucker on the DFO SAR map (DFO 2022).
MUSSELS			
Mapleleaf (Great Lakes - Upper St. Lawrence populations) (<i>Quadrula quadrula</i>)	Mapleleaf is found in a variety of habitats, including medium to large rivers with slow to moderate current, big river embayments, shallow lakes and in deep river impoundments (COSEWIC 2006). It has been recorded from mud, sand, and gravel substrates (COSEWIC 2006).	Background/online data collection and aquatic habitat assessment.	Suitable habitat is present within the Study Area in the Detroit River, and Turkey Creek. Canard River is mapped as occupied habitat for the Mapleleaf on the DFO SAR map (DFO 2022) which is close to the Study Area boundary.
Animal Movement Corridors			
Amphibian Movement Corridor	Corridors may be found in all ecosites associated with water. Determined based on identifying significant amphibian breeding habitat (wetland).	Identified after Amphibian Breeding Habitat - Wetland is confirmed. Movement corridors should be considered when amphibian breeding habitat is confirmed as SWH from Amphibian Breeding Habitat (Wetland).	Candidate amphibian breeding habitat occurs within the Study Area and potential for amphibian movement corridors. Candidate amphibian movement corridor.

REFERENCES

- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011a. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. <https://michiganflora.net/species.aspx?id=1851>.
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011b. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. <http://michiganflora.net/species.aspx?id=2013>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011c. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: January 21, 2016. <http://michiganflora.net/species.aspx?id=2016>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011d. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: January 21, 2016. <http://michiganflora.net/species.aspx?id=580>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011e. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June, 2021. <http://michiganflora.net/species.aspx?id=159>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011f. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June, 2021. <http://michiganflora.net/species.aspx?id=161>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011g. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June, 2021. <http://michiganflora.net/species.aspx?id=1854>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011h. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June, 2021. <http://michiganflora.net/species.aspx?id=1855>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011i. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 21, 2021. <http://michiganflora.net/species.aspx?id=1014>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011j. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 21, 2021. <http://michiganflora.net/species.aspx?id=1053>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011k. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 21, 2021. <http://michiganflora.net/species.aspx?id=1058>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011l. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 21, 2021. <http://michiganflora.net/species.aspx?id=285>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011m. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 21, 2021. <http://michiganflora.net/species.aspx?id=299>

- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011n. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 23, 2021. <http://michiganflora.net/species.aspx?id=852>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011o. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: January 21, 2016. <http://michiganflora.net/species.aspx?id=1288>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011p. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 23, 2021. <http://michiganflora.net/species.aspx?id=2079>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011q. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 23, 2021. <http://michiganflora.net/species.aspx?id=2084>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011r. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 23, 2021. <http://michiganflora.net/species.aspx?id=2088>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011s. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 23, 2021. <http://michiganflora.net/species.aspx?id=804>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011t. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 23, 2021. <http://michiganflora.net/species.aspx?id=321>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011u. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 23, 2021. <http://michiganflora.net/species.aspx?id=327>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011v. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 23, 2021. <http://michiganflora.net/species.aspx?id=1735>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011w. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 23, 2021. <http://michiganflora.net/species.aspx?id=2664>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011x. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: January 21, 2016. <http://michiganflora.net/species.aspx?id=573>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011y. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 23, 2021. <http://michiganflora.net/species.aspx?id=1461>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011z. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 23, 2021. <http://michiganflora.net/species.aspx?id=1466>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011aa. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=1499>

- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ab. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=1502>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ac. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=1503>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ad. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=1514>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ae. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=1516>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011af. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://www.michiganflora.net/species.aspx?id=382>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ag. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=816>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ah. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=577>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ai. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=1754>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011aj. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=1756>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ak. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=1560>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011al. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=1660>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011am. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=1725>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011an. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=1762>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ao. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: June 25, 2021. <http://michiganflora.net/species.aspx?id=133>

- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ap. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=2205>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011aq. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=2268>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ar. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=2299>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011as. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: November 4, 2021. <http://michiganflora.net/species.aspx?id=1584>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011at. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=1585>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011au. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=1384>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011av. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=2391>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011aw. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=1160>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ax. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=1162>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ay. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=1597>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011az. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. <http://michiganflora.net/species.aspx?id=447>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011ba. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=448>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011bb. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=1480>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011bc. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=2687>

- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011bd. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=2690>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011be. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: December 24, 2021. <http://michiganflora.net/species.aspx?id=2404>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011bf. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: February 2, 2022. <http://michiganflora.net/species.aspx?id=146>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011bg. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: February 2, 2022. <http://michiganflora.net/species.aspx?id=825>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011bh. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: February 2, 2022. <http://michiganflora.net/species.aspx?id=1166>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011bi. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: February 2, 2022. <http://michiganflora.net/species.aspx?id=735>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011bj. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: February 2, 2022. <http://michiganflora.net/species.aspx?id=515>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011bk. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: February 2, 2022. <http://michiganflora.net/species.aspx?id=516>
- A. A. Reznicek, E. G. Voss, & B. S. Walters. 2011bl. MICHIGAN FLORA ONLINE. February 2011. University of Michigan. Accessed: February 2, 2022. <http://michiganflora.net/species.aspx?id=2806>
- Argus, G.W., K.M. Pryer, D.J. White and C.J. Keddy (eds.). 1982-1987. Atlas of the Rare Vascular Plants of Ontario.. Botany Division, National Museum of National Sciences, Ottawa
- Ball, P.W. and A.A. Reznicek. 2002. Carex. In Flora of North America North of Mexico (Flora of North America Editorial Committee, eds.). New York and Oxford. Vol. 23; Retrieved from the Flora of North America Online: http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242357145
- Borror, D. J., & White, R. E. (1998). A field guide to insects: America north of Mexico. Boston: Houghton Mifflin.
- Buck, M., Marshall, S. A., & Cheung, D. K. B. (2008). Identification Atlas of the Vespidae (Hymenoptera, Aculeata) of the northeastern Nearctic region. Canadian Journal of Arthropod Identification, 05. <https://doi.org/10.3752/cjai.2008.05>

- Cadman, M. D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier. 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. (eds) Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of natural resources, and Ontario Nature, Toronto, xxii + 706pp
- Catling, P.M., and V.R. Brownell. 2000. Damselflies and Dragonflies (Odonata) of Ontario. Resource Guide and Annotate List. ProResources Metcalfe, Ontario. 200pp.
- Cotinis (December 2, 2017). "Species Mellilla xanthometata - Orange Wing - Hodges#6271.1". BugGuide. Retrieved June 21, 2019.
- Cornell University. 2019a. Forster's tern life history, All About Birds, Cornell Lab of Ornithology. Retrieved May 20, 2021, from https://www.allaboutbirds.org/guide/Forsters_Tern/lifehistory
- Cornell University. 2019b. Black-crowned Night-Heron Life History, All About Birds, Cornell Lab of Ornithology. Retrieved January 14, 2021, from https://www.allaboutbirds.org/guide/Black-crowned_Night-Heron/lifehistory
- COSEWIC 2002a. COSEWIC assessment and update status report on the common hoptree *Ptelea trifoliata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 14 pp.
- COSEWIC 2002b. COSEWIC assessment and update status report on the Milksnake *Lampropeltis tirangulum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. . vi + 29 pp.
- COSEWIC 2002c. COSEWIC assessment and status report on the eastern ribbonsnake *Thamnophis sauritus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 24 pp. COSEWIC 2006. COSEWIC assessment and status report on the Golden-winged Warbler *Vermivora chrysoptera* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 30 pp.
- COSEWIC 2002d. COSEWIC assessment and status report on the northern map turtle *Graptemys geographica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 34 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 2004. COSEWIC assessment and update status report on the swamp rose-mallow *Hibiscus moscheutos* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 43 pp.
- COSEWIC 2005. COSEWIC assessment and update status report on the spotted sucker *Minytrema melanops* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 16 pp.
- COSEWIC 2006. COSEWIC assessment and status report on the Mapleleaf Mussel *Quadrula quadrula* (Saskatchewan-Nelson population and Great Lakes-Western St. Lawrence population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 58 pp.

- COSEWIC 2007. COSEWIC assessment and update status report on the Peregrine Falcon *Falco peregrinus* (pealei subspecies - *Falco peregrinus* and pealei anatum/tundrius - *Falco peregrinus anatum/tundrius*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 45 pp.
- COSEWIC. 2008. COSEWIC assessment and status report on the Snapping Turtle *Chelydra serpentina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 47 pp.
- COSEWIC. 2010. COSEWIC assessment and status report on the Chestnut Lamprey *Ichthyomyzon castaneus* (Great Lakes - Upper St. Lawrence populations and Saskatchewan - Nelson River populations) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 35 pp.
- COSEWIC [Committee on the Status of Endangered Wildlife in Canada], 2011a. COSEWIC assessment and status report on the barn swallow *Hirunda rustica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 37 pp. (www.sararegistry.gc.ca/status/status_e.cfm)
- COSEWIC. 2011b. COSEWIC assessment and status report on the Silver Lamprey, Great Lakes - Upper St. Lawrence populations and Saskatchewan - Nelson Rivers populations *Ichthyomyzon unicuspis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 55 pp.
- COSEWIC. 2016a. COSEWIC assessment and status report on the Monarch *Danaus plexippus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 59 pp. (Species at Risk Public Registry website).
- COSEWIC. 2016b. COSEWIC assessment and status report on the Northern Sunfish *Lepomis peltastes*, Saskatchewan - Nelson River populations and the Great Lakes - Upper St. Lawrence populations, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv + 51 pp. (http://www.registrelep-sararegistry.gc.ca/default_e.cfm)
- COSEWIC. 2016c. COSEWIC assessment and status report on the Channel Darter *Percina copelandi*, Lake Erie populations, Lake Ontario populations and St. Lawrence populations, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xvi + 68 pp.
- COSEWIC. 2019. COSEWIC assessment and status report on the Reversed Haploa Moth *Haploa reversa* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 40 pp. (Species at risk public registry).
- Cuthbert, Francesca J. and Linda R. Wires. 1999. Caspian Tern (*Hydroprogne caspia*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/403>
- DFO [Fisheries and Oceans Canada]. 2022. Government of Canada. Aquatic Species at Risk Map. Online: <https://www.dfo-mpo.gc.ca/species-especies/sara-lep/map-carte/index-eng.html>. Accessed February 8, 2022.
- Dourson, D.C. 2010. Kentucky's land snails and their ecological communities. Goatslug Publications, Bakersville, NC. 298 pp.

- EC (Environment Canada). 2008. Species at risk public registry website. www.sararegistry.gc.ca. accessed August 14, 2008.
- Evergreen. 2000-2014. Plant Detail *Liatris aspera*. Accessed November 3, 2015. <http://nativeplants.evergreen.ca/search/view-plant.php?ID=00394&query=%20AND%20genus%20LIKE%20%27%24liatris%24%27%20:0>.
- Farrar, J.L. 1995. Gleason, H.A and A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. 2nd Ed. New York Botanical Garden: Bronx, NY. 993 pp. Trees in Canada. Fitzhenry & Whiteside Limited and the Canadian Forest Service. Canada. 502 pp 993.
- Gleason, H.A and A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. 2nd Ed. New York Botanical Garden: Bronx, NY. pp.
- Hall, P. W., C. Jones, A. Guidotti, and B. Hubley. 2014. The ROM field guide to butterflies of Ontario. Toronto, Ont: Royal Ontario Museum.
- Holmes, A.M., Q.F. Hess, R.R. Tasker, A.J. Hanks. 1991. The Ontario Butterfly Atlas. 1991. Toronto Entomologists' Association, Toronto. 167pp.
- Hotopp, K. (2013). Virginia Land Snails *Pomatiopsis lapidaria* (Say, 1817). Mollusks : Carnegie Museum of Natural history. Retrieved February 3, 2022, from https://www.carnegiemnh.org/science/mollusks/va_pomatiopsis_lapidaria.html
- Hubricht, L. 1985. The distribution of the native land mollusks of the eastern United States. *Fieldiana: Zoology* 24:1-191.
- Jones, C., A. Kingsley, P. Burke and M. Holder. The Dragonflies and Damselflies of Algonquin Provincial Park and the Surrounding Area: Field Guide. The Friends of Algonquin Park, Whitney, Ontario, Canada, 2008, pp. 120-121.
- Lamond, W. G. 1994. The Reptiles and Amphibians of the Hamilton Area – an Historical Summary and the Results of the Hamilton Herpetofaunal Atlas. Hamilton Naturalists' Club, Hamilton, Ontario. 174 pp.
- Layberry, R.A., P.W. Hall and J.D. Lafontaine. 1998. The butterflies of Canada. University of Toronto Press, Toronto. 280pp.
- 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. McClelland & Steward Ltd. Toronto, Ontario. 168pp.
- MNRF. 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E. January, 2015. 41 pp.
- National Audubon Society (N.A.S), 2012. Red-headed Woodpecker *Melanerpes erythrocephalus*. Available Online at: <http://birds.audubon.org/species/redwoo>
- (NHIC) Natural Heritage Information Centre, 2021. Ontario Ministry of Natural Resources and Forestry. Ontario Species List.

- NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available [http:// http://explorer.natureserve.org/](http://explorer.natureserve.org/)
- NatureServe 2020. *Spiranthes magnicamporum* Great Plains Ladies'-tresses. Retrieved December 02, 2020, from https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.128169/Spiranthes_magnicamporum
- Newcomb, L., 1977. Wildflower Guide. Little Brown and Company, New York, NY. 58 pp.
- Nekola, J.C. 2010. Acidophilic terrestrial gastropod communities of North America. *Journal of Molluscan Studies* 76:144-156
- Oldham, Michael J. 2017. List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E). Carolinian Canada and Ontario Ministry of Natural Resources and Forestry. Peterborough, ON. 132 pp.
- Ontario Nature. (2020, November 27). Eastern Musk Turtle: Ontario nature: Advocate for Nature. Retrieved January 14, 2021, from <https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas/eastern-musk-turtle/>
- Paulson, D. R. 2009. *Argia tibialis*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org>. Downloaded on 17 October 2012
- Marshall, S.A., S.M. Paiero and O. Lonsdale. 2006. New records of Orthoptera from Canada and Ontario. *Journal of the Entomological Society of Ontario* 135 (2004): 101-107.
- Semple, J.C. and R.E. Cook. 2006. *Solidago*. In *Flora of North America North of Mexico* (Flora of North America Editorial Committee, eds.). New York and Oxford. Vols. 19-21; Retrieved from the Flora of North America Online: http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242417296
- Sheviak, C.J. and P.M. Brown. 2002. *Spiranthes*. In *Flora of North America North of Mexico* (Flora of North America Editorial Committee, eds.). New York and Oxford. Vol. 26; Retrieved from the Flora of North America Online: http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242101958
- Stout, B.E. and G.L. Nuechterlein. 1999. Red-necked Grebe (*Podiceps grisegena*), *The Birds of North America Online* (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/465>, doi:10.2173/bna.465. Accessed November 13, 2015.
- Stone, D.E. 1997. *Carya*. In *Flora of North America North of Mexico* (Flora of North America Editorial Committee, eds.). New York and Oxford. Vol. 3; Retrieved from the Flora of North America Online: http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=233500317

- Thompson, S.A. 2000. Araceae. *In* Flora of North America North of Mexico (Flora of North America Editorial Committee, eds.). New York and Oxford. Vol. 22; Retrieved from the Flora of North America Online:
http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=250061786
- Voss, E. G., 1972. Michigan Flora: Gymnosperms and Monocots, Part 1. Cranbrook Institute of Science, Bloomfield Hills, Michigan, pp. 294
- (WATRI) Wisconsin Aquatic and Terrestrial Resources Inventory 2021a. *Ischnura hastata* Citrine Forktail. Retrieved May 17, 2021, from <https://wiatri.net/inventory/odonata/speciesaccounts/SpeciesDetail.cfm?TaxalD=56>
- (WATRI) Wisconsin Aquatic and Terrestrial Resources Inventory 2021b. *Gomphus vastus* Cobra Clubtail. Retrieved May 17, 2021, from <https://wiatri.net/inventory/odonata/speciesaccounts/SpeciesDetail.cfm>
- (WATRI) Wisconsin Aquatic and Terrestrial Resources Inventory 2021c. *Progomphus obscurus* Common Sanddragon. Retrieved May 17, 2021, from <https://wiatri.net/inventory/odonata/speciesaccounts/SpeciesDetail.cfm?TaxalD=116>
- (WATRI) Wisconsin Aquatic and Terrestrial Resources Inventory 2021d. *Stylurus notatus* Elusive Clubtail. Retrieved May 17, 2021, from <https://wiatri.net/inventory/odonata/speciesaccounts/SpeciesDetail.cfm?TaxalD=112>
- (WATRI) Wisconsin Aquatic and Terrestrial Resources Inventory 2021e. *Macromia taeniolata* Royal River Cruiser. Retrieved May 17, 2021, from <https://wiatri.net/inventory/odonata/speciesaccounts/SpeciesDetail.cfm?TaxalD=166>
- (WATRI) Wisconsin Aquatic and Terrestrial Resources Inventory 2021f. *Libellula vibrans* Great Blue Skimmer. Retrieved May 17, 2021, from <https://wiatri.net/inventory/odonata/speciesaccounts/SpeciesDetail.cfm?TaxalD=145>
- (WATRI) Wisconsin Aquatic and Terrestrial Resources Inventory 2021g. *Archilestes grandis* Great Spreadwing. Retrieved May 17, 2021, from <https://wiatri.net/inventory/odonata/speciesaccounts/SpeciesDetail.cfm?TaxalD=126>

Appendix C Aquatic Habitat Assessment Photographic Record





Photo 1: April 13, 2021. WC-1 Turkey Creek, G. Craig Park



Photo 2: April 13, 2021. WC-2 Detroit River, Gil Maure Park



Photo 3: April 13, 2021. Detroit River, Gil Maure Park



Photo 4: April 13, 2021. WC-3 Marentette Drain, east aspect from Front Road



Photo 5: April 13, 2021. WC-3 Marentette Drain, west aspect from Front Road



Photo 6: April 13, 2021. WC-3 Marentette Drain, Gilbert Park





Photo 7: April 13, 2021. WC-4 Laferty Drain



Photo 8: April 13, 2021. WC-5 North Branch Railway Drain, south aspect from International Avenue



Photo 9: April 13, 2021. WC-5 North Branch Railway Drain, north aspect from International Avenue

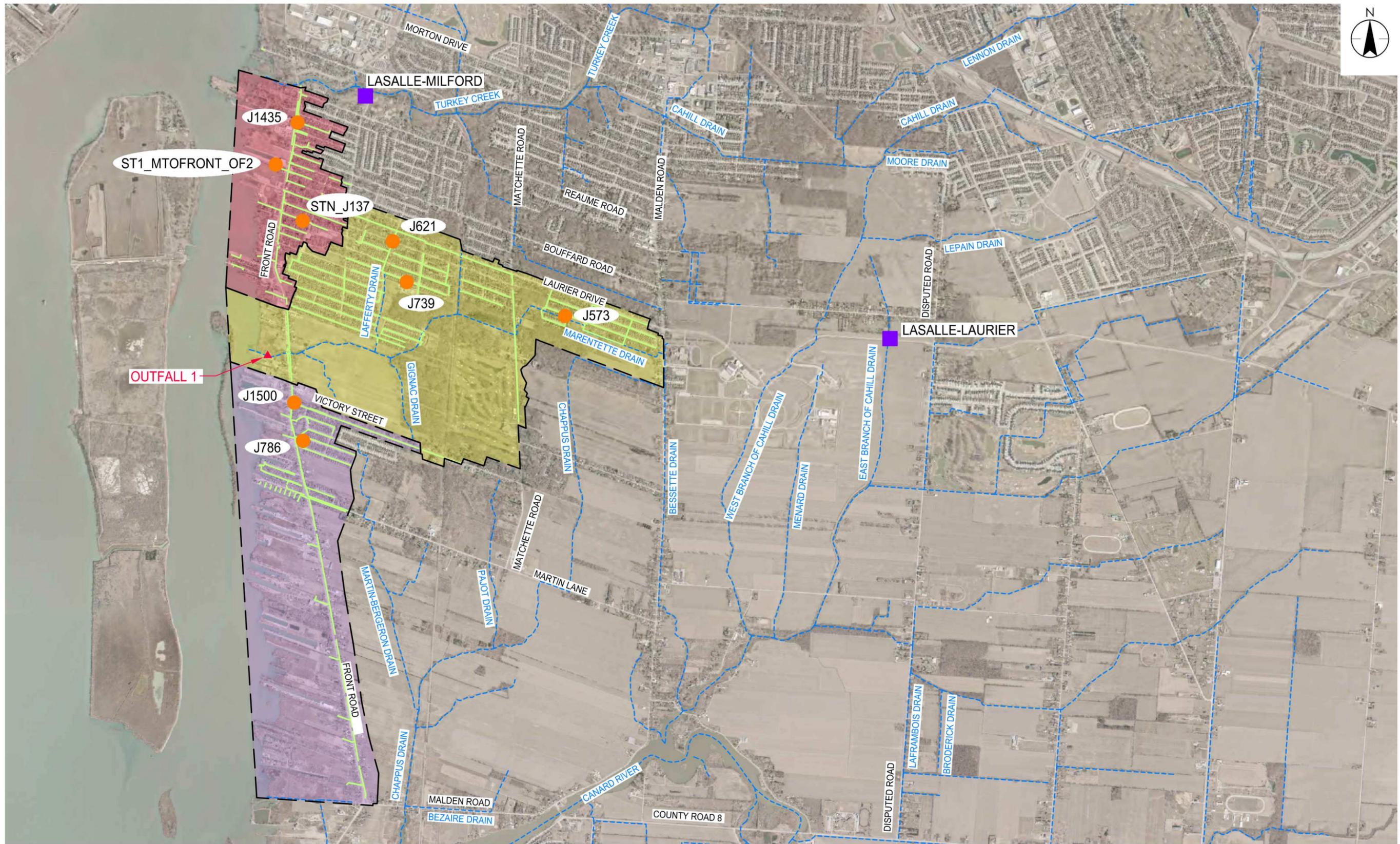


Photo 10: April 13, 2021. WC-6 Bessette Drain



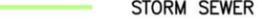
APPENDIX C: Figures





Corporation of the County of Essex 2021

LEGEND

-  OUTFALL
-  STORM SEWER
-  STUDY BOUNDARY REVISED
-  PHASE 1
-  PHASE 2
-  PHASE 3
-  MONITOR LOCATION
-  RAIN GAUGE
-  FLOW MONITOR

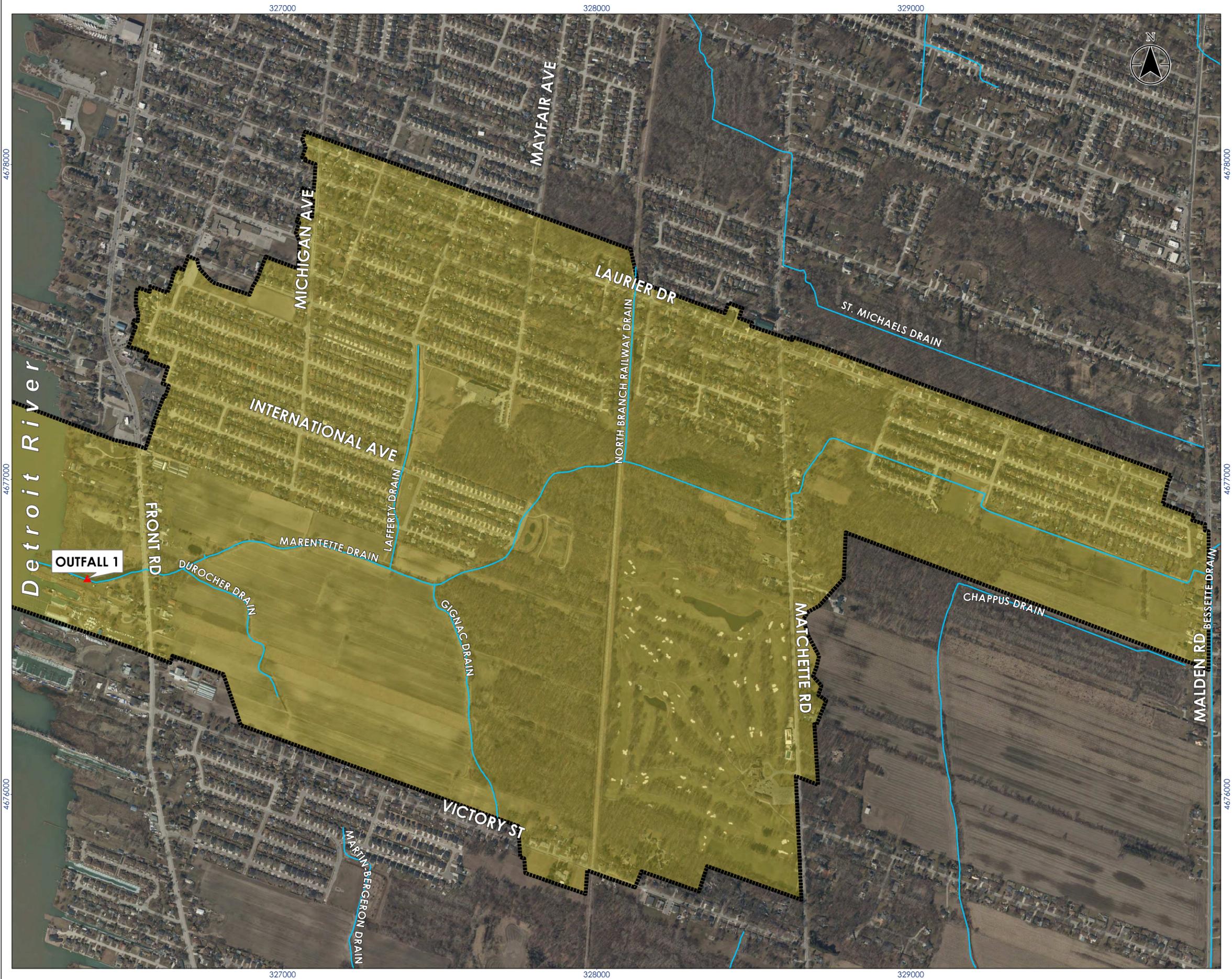


**TOWN OF LASALLE
STORMWATER MASTER PLAN
STAGE 2**

OVERALL STUDY AREA, RAIN GAUGES & FLOW MONITORING SITES

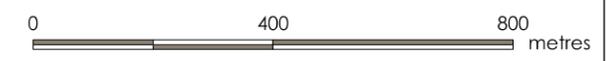
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161414064

FIGURE NO.
FIGURE 4



Legend

-  Stage 2 Study Area
-  Outfall
-  Municipal Drains



- Notes** 1:6,000 (At original document size of 22x34)
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
 3. Orthoimagery © First Base Solutions, 2018. Imagery Date, 2019.
 4. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018. Elevations from SWOOP 2015 Digital Elevation Model.



Project Location
Town of LaSalle

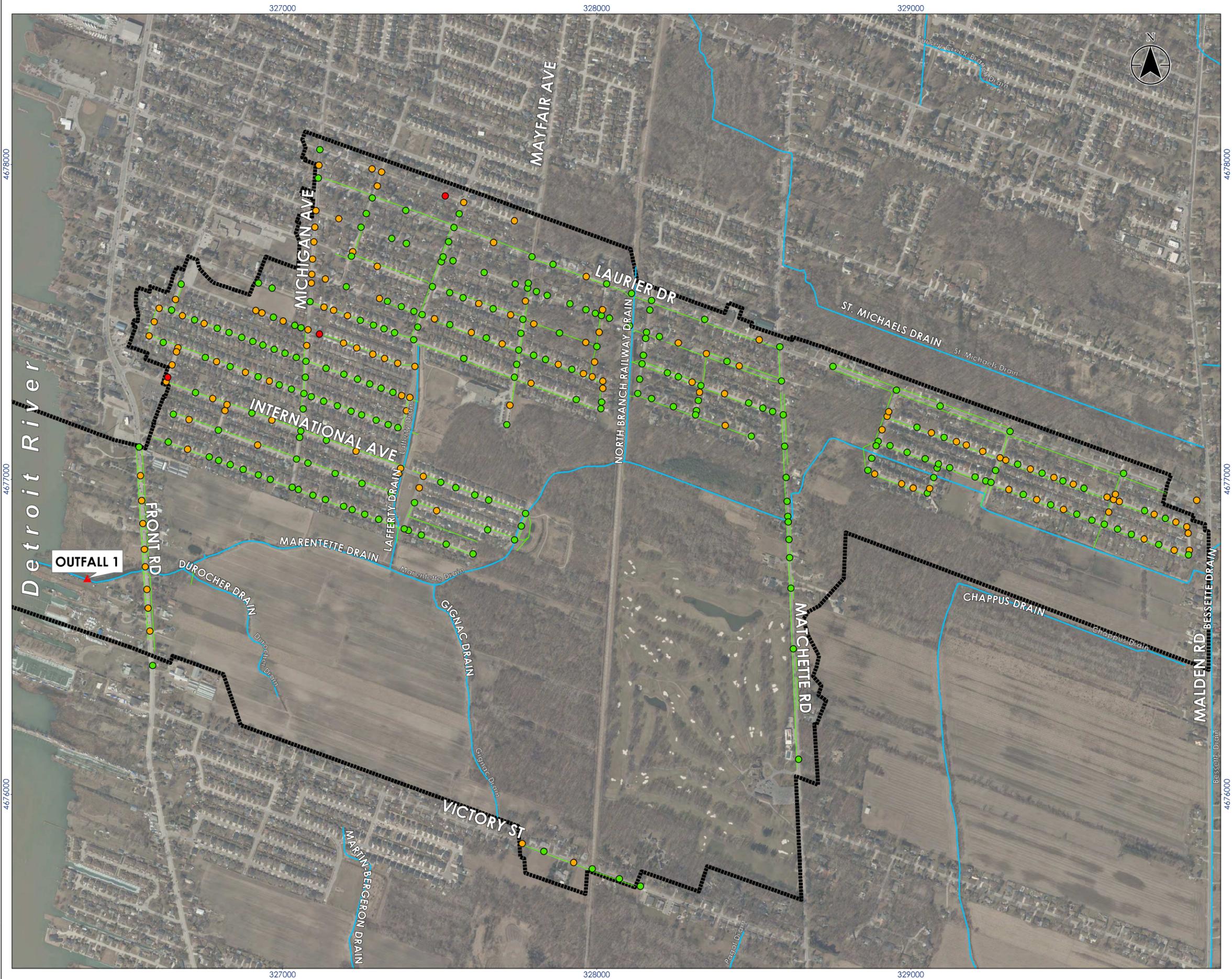
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Prepared by HR on 2023-05-24

Client/Project
LaSalle Stormwater Master Plan - Stage 2

Figure No.
5

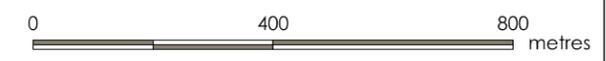
Title
Project Study Area - Stage 2

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Legend

- Stage 2 Study Area
- Outfall
- Existing Storm Sewer
- Municipal Drains
- Road Pounding**
- Max. Depth = 0 m
- Max. Depth <= 0.3 m
- Max. Depth <= 0.5 m



Notes
 1: 1:6,000 (At original document size of 22x34)
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Produced using information under license with the Town of LaSalle.

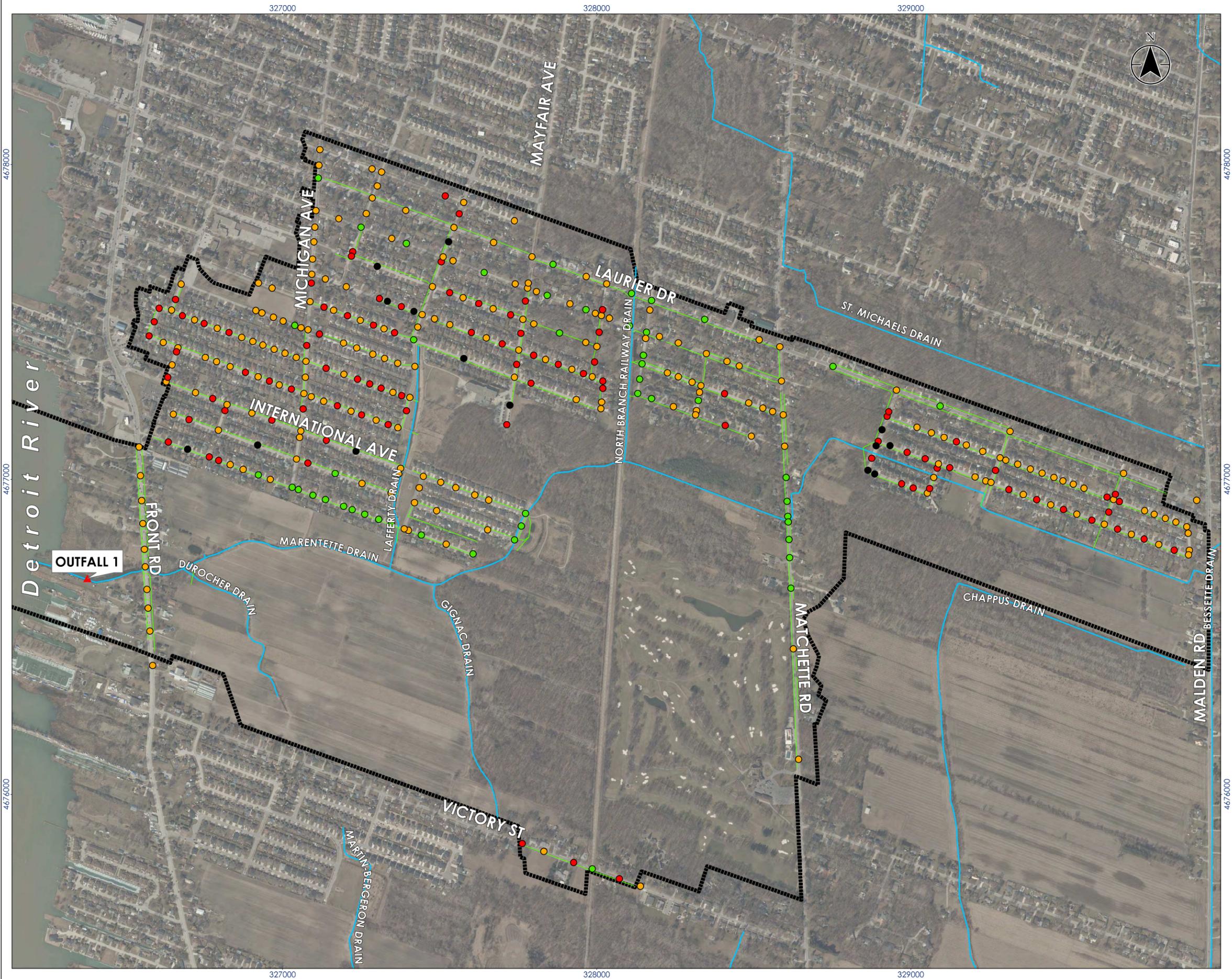


Project Location
 Town of LaSalle
 161414064 REVA
 Prepared by HR on 2023-06-01

Client/Project
 LaSalle Stormwater Master Plan - Stage 2

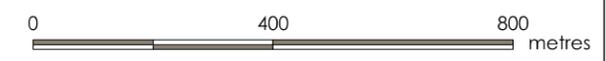
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**Alternative 1: Do Nothing
 5-Year Rainfall Event
 25-Year Detroit River Water Level**

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Legend

- Stage 2 Study Area
- Outfall
- Existing Storm Sewer
- Municipal Drains
- Road Ponding**
- Max. Depth = 0 m
- Max. Depth <= 0.3 m
- Max. Depth <= 0.5 m
- Max. Depth > 0.5 m



Notes
 1:6,000 (At original document size of 22x34)
 1. Coordinate System: NAD 1983 UTM Zone 17N
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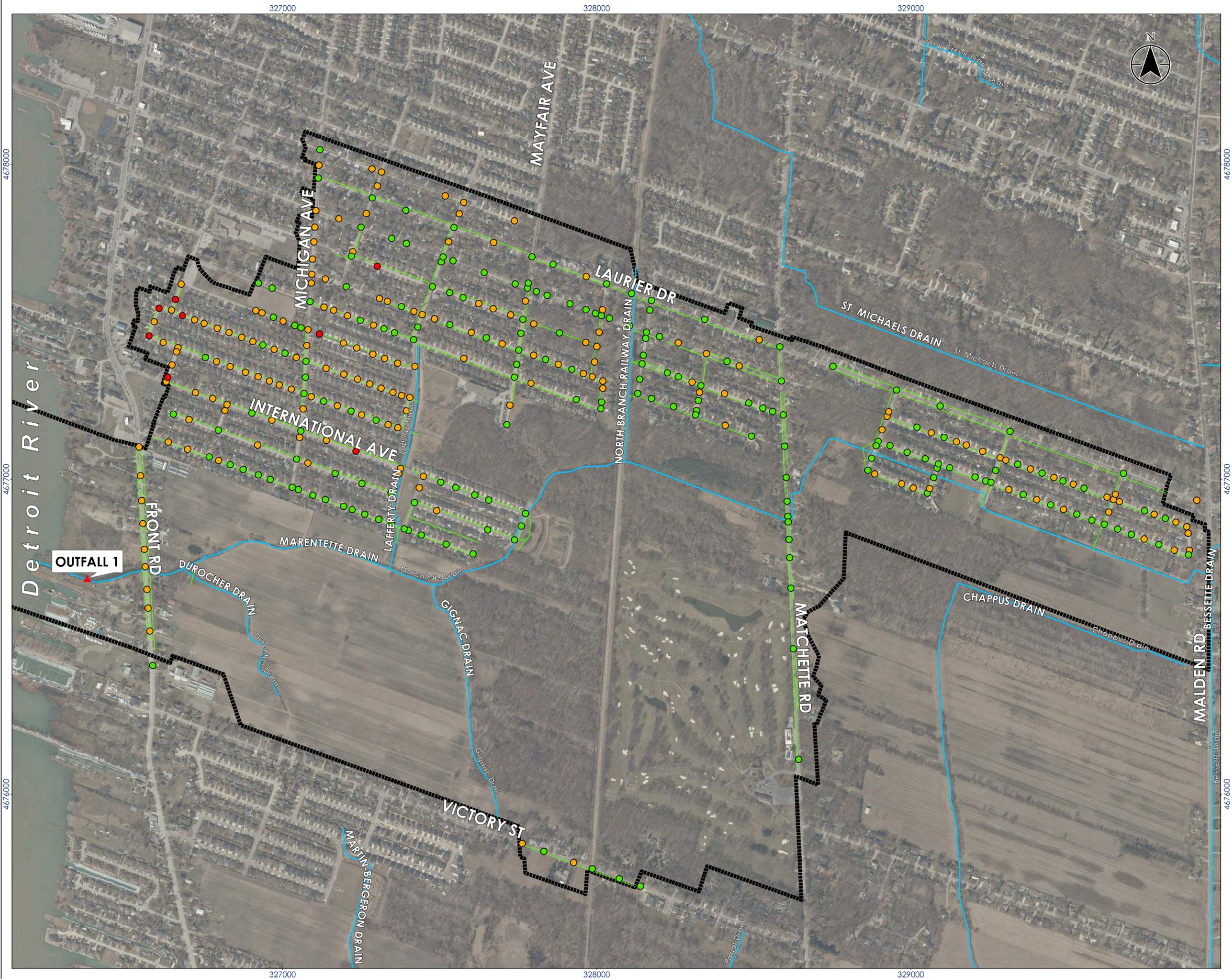


Project Location
 Town of LaSalle
 161414064 REVA
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Client/Project
 LaSalle Stormwater Master Plan - Stage 2

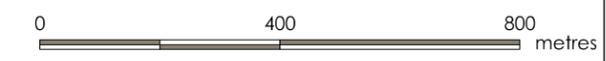
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**Alternative 1: Do Nothing
 100-Year Rainfall Event
 25-Year Detroit River Water Level**

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Legend

- Stage 2 Study Area
- Outfall
- Existing Storm Sewer
- Municipal Drains
- Road Ponding**
- Max. Depth = 0 m
- Max. Depth <= 0.3 m
- Max. Depth <= 0.5 m



Notes
 1: 1:6,000 (At original document size of 22x34)
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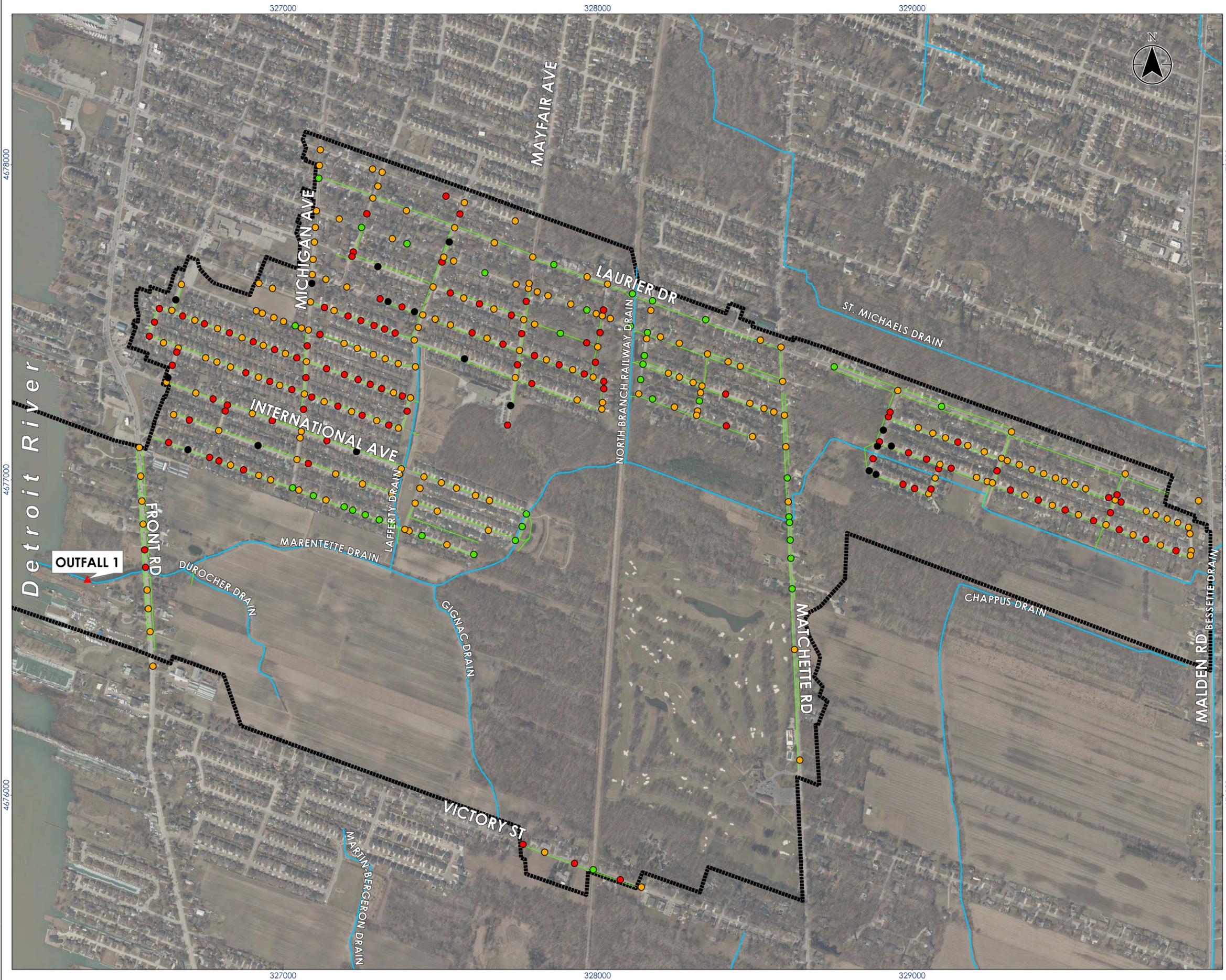


Project Location
 Town of LaSalle
 161414064 REVA
 Prepared by HR on 2023-06-01

Client/Project
 LaSalle Stormwater Master Plan - Stage 2

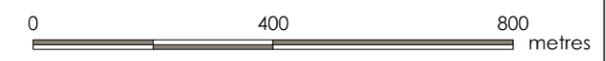
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6.3
 Title
**Alternative 1: Do Nothing
 5-Year Rainfall Event
 2020 Detroit River High Water Level**

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 Revised: 2023-06-01 By: jpcweller



Legend

- Stage 2 Study Area
 - Outfall
 - Existing Storm Sewer
 - Municipal Drains
- Road Pounding**
- Max. Depth = 0 m
 - Max. Depth <= 0.3 m
 - Max. Depth <= 0.5 m
 - Max. Depth > 0.5 m



Notes 1:6,000 (At original document size of 22x34)

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Produced using information under license with the Town of LaSalle.



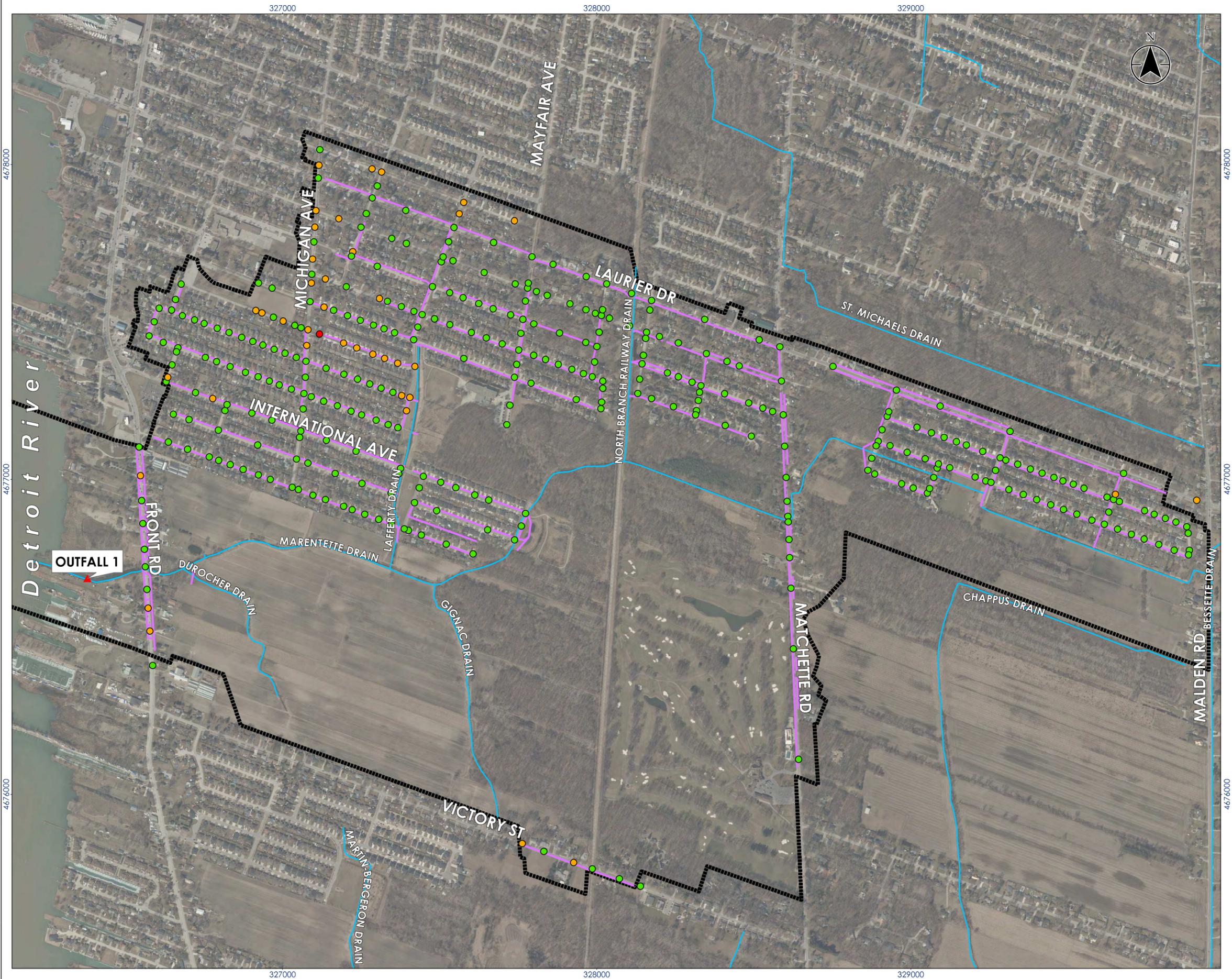
Project Location
Town of LaSalle 161414064 REVA
Prepared by HR on 2023-06-01

Client/Project
LaSalle Stormwater Master Plan - Stage 2

Figure No.
6.4

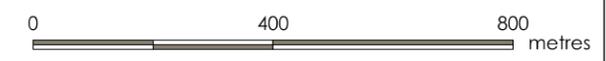
Title
**Alternative 1: Do Nothing
100-Year Rainfall Event
2020 Detroit River High Water Level**

C:\2023\ps1001\work_group\016\Archive\161414064\S1001\Map\1001\2020.mxd Reviewed: 2023-06-01 By: jrcwallier
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Legend

- Stage 2 Study Area
 - Outfall
 - Upgraded Storm Sewer
 - Municipal Drains
- Road Ponding**
- Max. Depth = 0 m
 - Max. Depth <= 0.3 m
 - Max. Depth <= 0.5 m



Notes
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 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Produced using information under license with the Town of LaSalle.

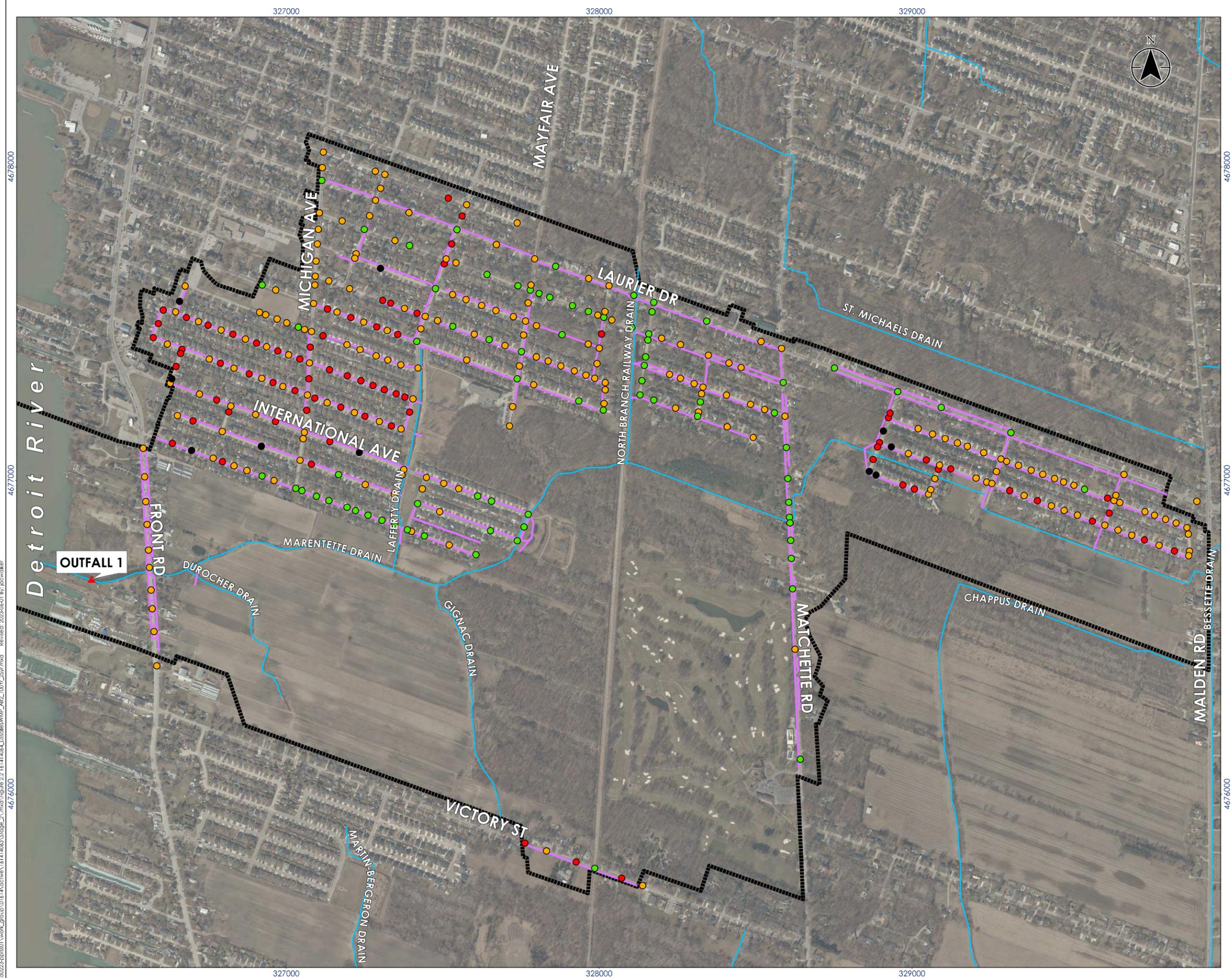


Project Location
 Town of LaSalle
 161414064 REVA
 Prepared by HR on 2023-06-01

Client/Project
 LaSalle Stormwater Master Plan - Stage 2

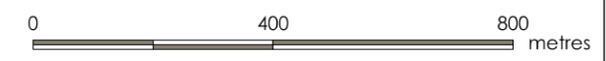
Figure No.
7.1
 Title
**Alternative 2: Upsize Sewers
 5-Year Rainfall Event
 25-Year Detroit River Water Level**

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 Revised: 2023-06-01 By: jcw/walter
 4676000
 4677000
 4678000



Legend

- Stage 2 Study Area
 - Outfall
 - Upgraded Storm Sewer
 - Municipal Drains
- Road Ponding**
- Max. Depth = 0 m
 - Max. Depth <= 0.3 m
 - Max. Depth <= 0.5 m
 - Max. Depth > 0.5 m



Notes 1:6,000 (At original document size of 22x34)

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Produced using information under license with the Town of LaSalle.

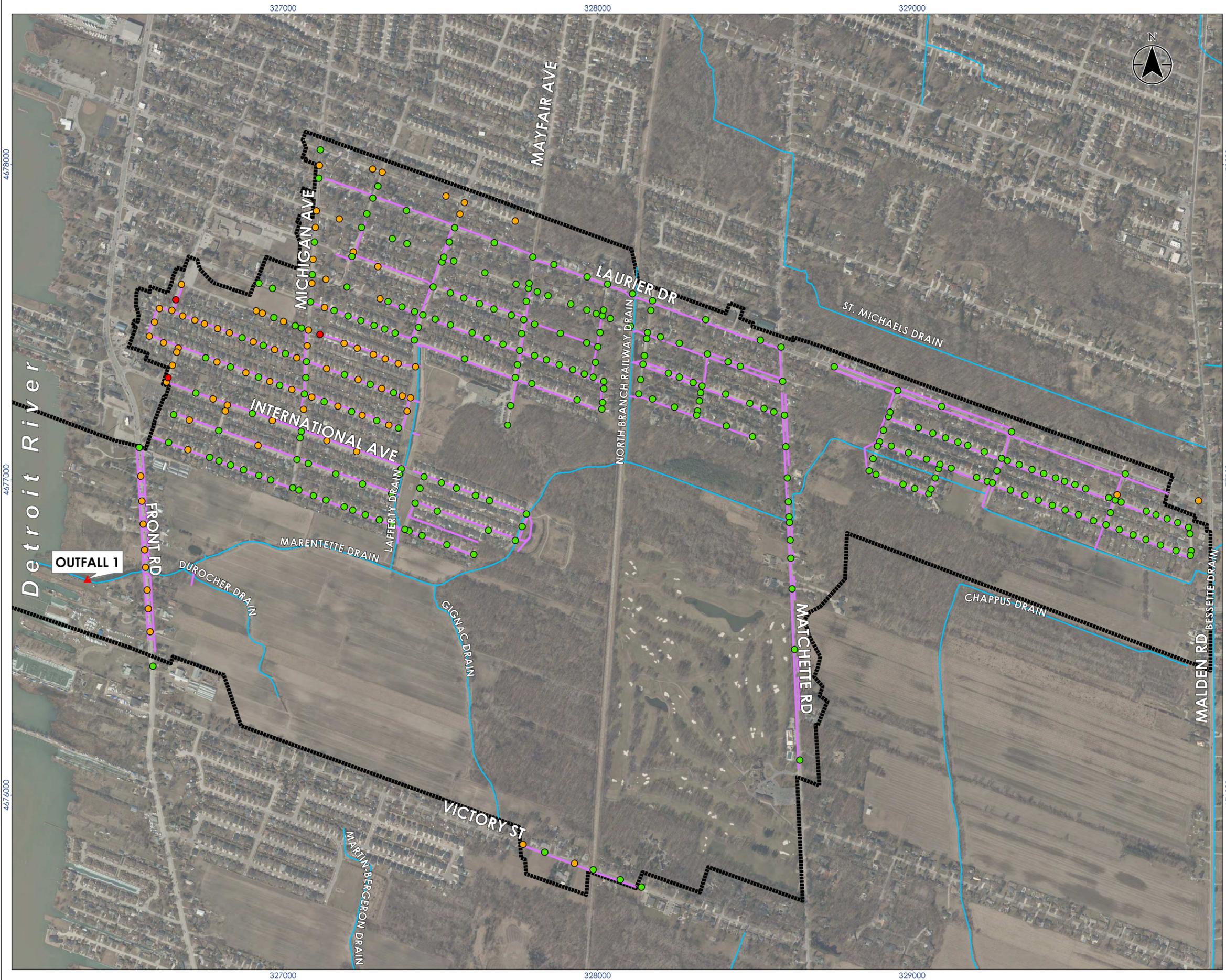


Project Location
Town of LaSalle 161414064 REVA
Prepared by HR on 2023-06-01

Client/Project
LaSalle Stormwater Master Plan - Stage 2

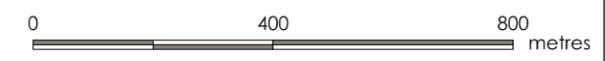
Figure No.
7.2
Title
**Alternative 2: Upsize Sewers
100-Year Rainfall Event
25-Year Detroit River Water Level**

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Legend

- Stage 2 Study Area
 - Outfall
 - Upgraded Storm Sewer
 - Municipal Drains
- Road Ponding**
- Max. Depth = 0 m
 - Max. Depth <= 0.3 m
 - Max. Depth <= 0.5 m



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1. Coordinate System: NAD 1983 UTM Zone 17N
2. Produced using information under license with the Town of LaSalle.



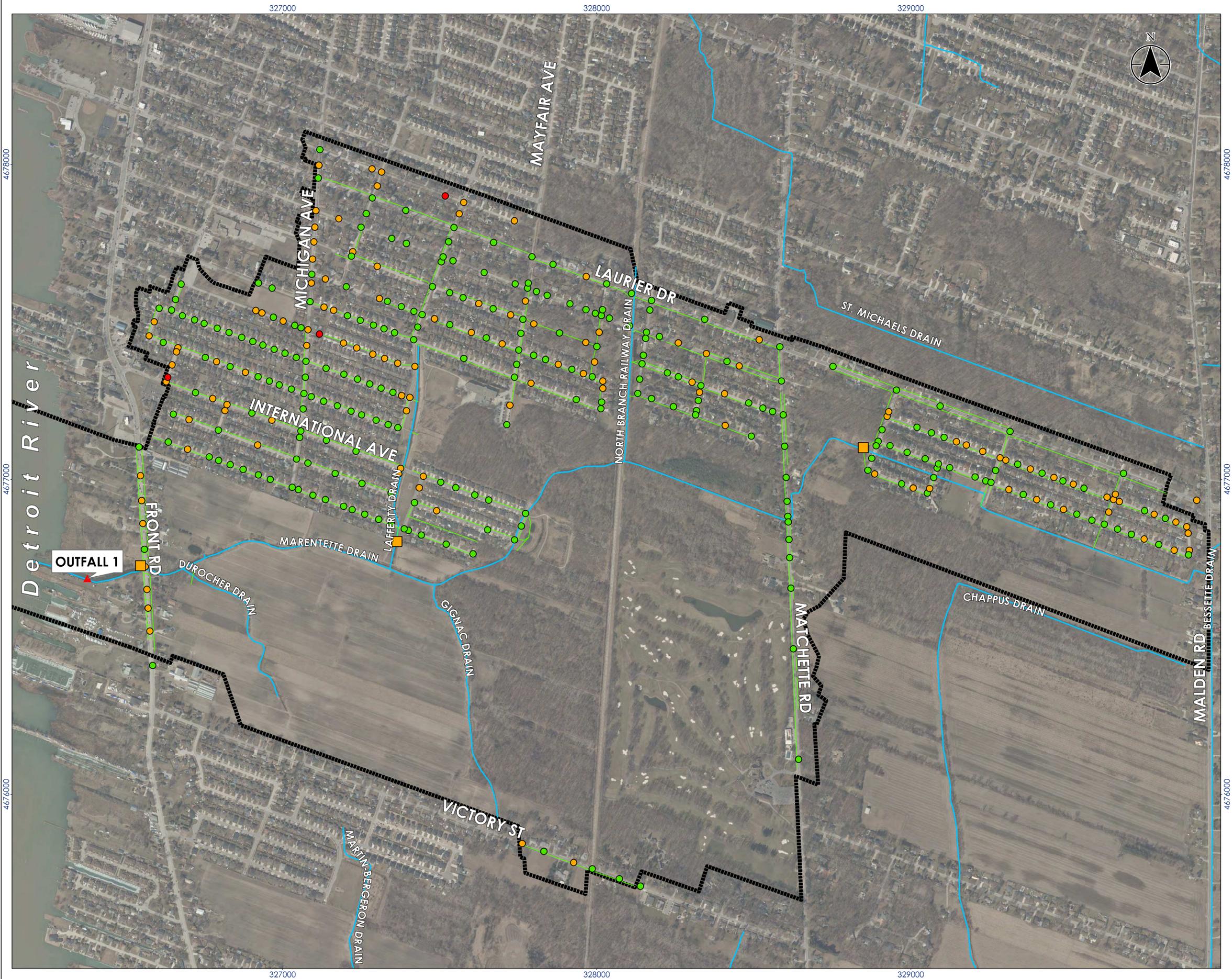
Project Location
Town of LaSalle 161414064 REVA
Prepared by HR on 2023-06-01

Client/Project
LaSalle Stormwater Master Plan - Stage 2

Figure No.
7.3

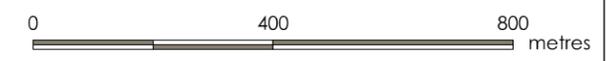
Title
**Alternative 2: Upsize Sewers
5-Year Rainfall Event
2020 Detroit River High Water Level**

I:\Co223-5\ps01\work_group\016\Archive\161414064\Stormwater\Map_S1_2023.mxd
 Revised: 2023-06-01 By: jpcweller



Legend

- Stage 2 Study Area
 - Outfall
 - Storm Pumping Station
 - Existing Storm Sewer
 - Municipal Drains
- Road Ponding**
- Max. Depth = 0 m
 - Max. Depth <= 0.3 m
 - Max. Depth <= 0.5 m



Notes 1:6,000 (At original document size of 22x34)

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Produced using information under license with the Town of LaSalle.

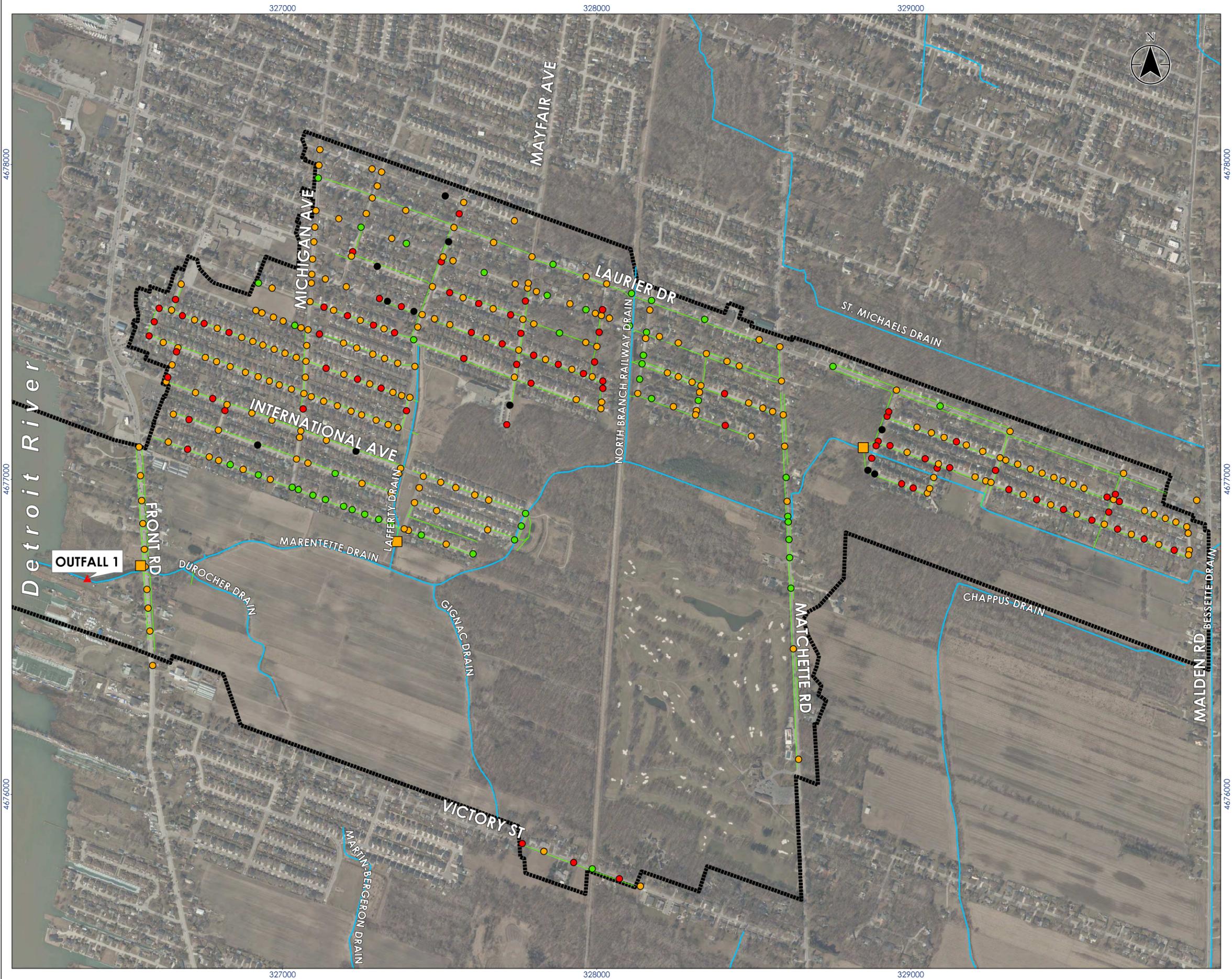


Project Location
Town of LaSalle 161414064 REVA
Prepared by HR on 2023-06-01

Client/Project
LaSalle Stormwater Master Plan - Stage 2

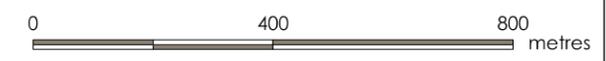
Figure No.
8.1
Title
**Alternative 3: Pump Stations
5-Year Rainfall Event
25-Year Detroit River Water Level**

I:\Co223-25\ps1001\work_group\016\Archive\161414064\Sigs\Sigs_2\mxd\Engine 3.1161414064_LasalleSWMP_AIR_S1_25f.mxd
 Revised: 2023-06-01 By: jcw/walter



Legend

- Stage 2 Study Area
 - Outfall
 - Storm Pumping Station
 - Existing Storm Sewer
 - Municipal Drains
- Road Ponding**
- Max. Depth = 0 m
 - Max. Depth <= 0.3 m
 - Max. Depth <= 0.5 m
 - Max. Depth > 0.5 m



Notes 1:6,000 (At original document size of 22x34)

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Produced using information under license with the Town of LaSalle.

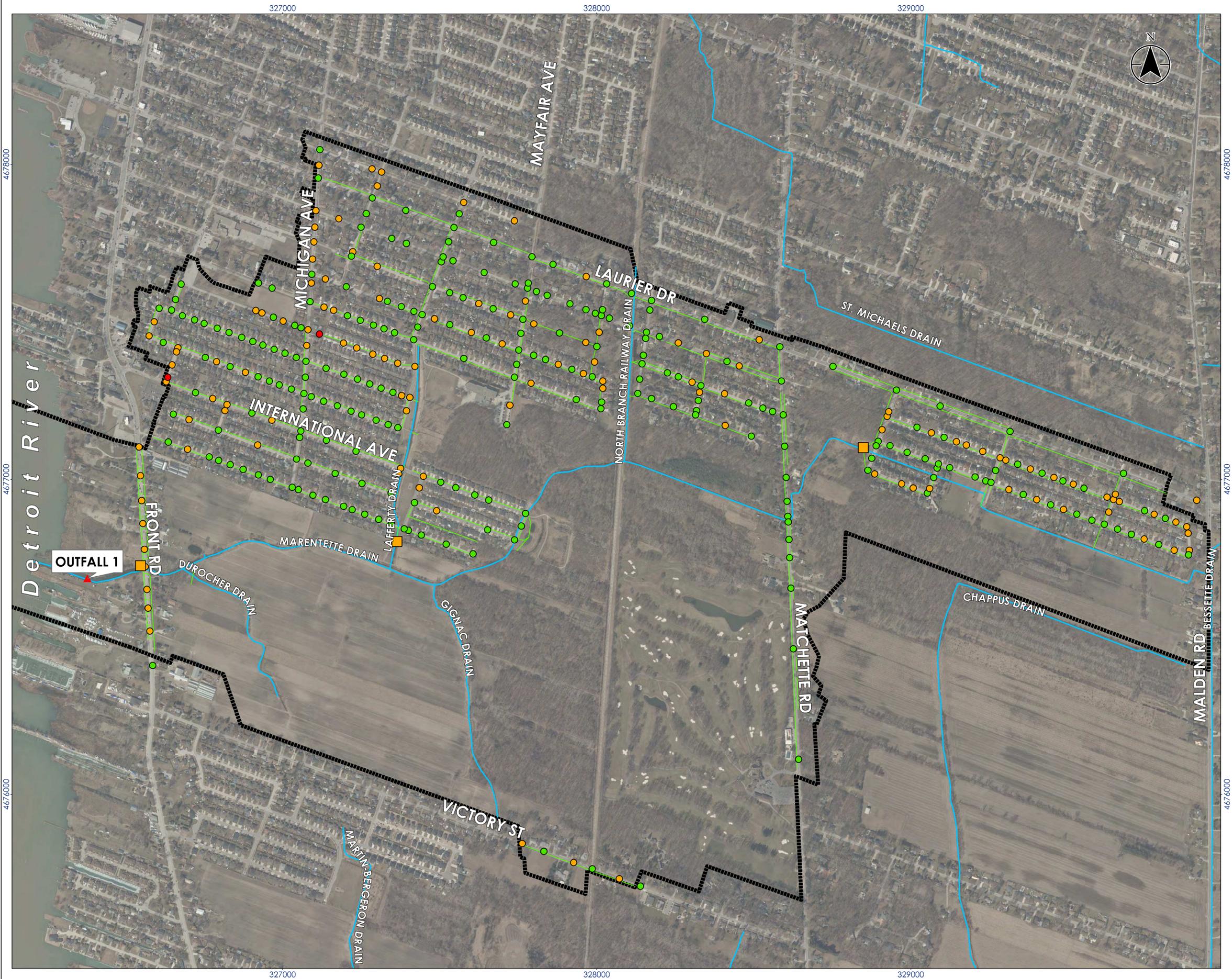


Project Location
Town of LaSalle 161414064 REVA
Prepared by HR on 2023-06-01

Client/Project
LaSalle Stormwater Master Plan - Stage 2

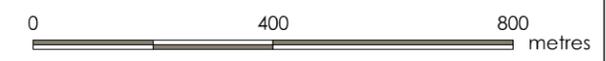
Figure No.
8.2
Title
**Alternative 3: Pump Stations
100-Year Rainfall Event
25-Year Detroit River Water Level**

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Legend

- Stage 2 Study Area
 - Outfall
 - Storm Pumping Station
 - Existing Storm Sewer
 - Municipal Drains
- Road Ponding**
- Max. Depth = 0 m
 - Max. Depth <= 0.3 m
 - Max. Depth <= 0.5 m



Notes 1:6,000 (At original document size of 22x34)
 1. Coordinate System: NAD 1983 UTM Zone 17N
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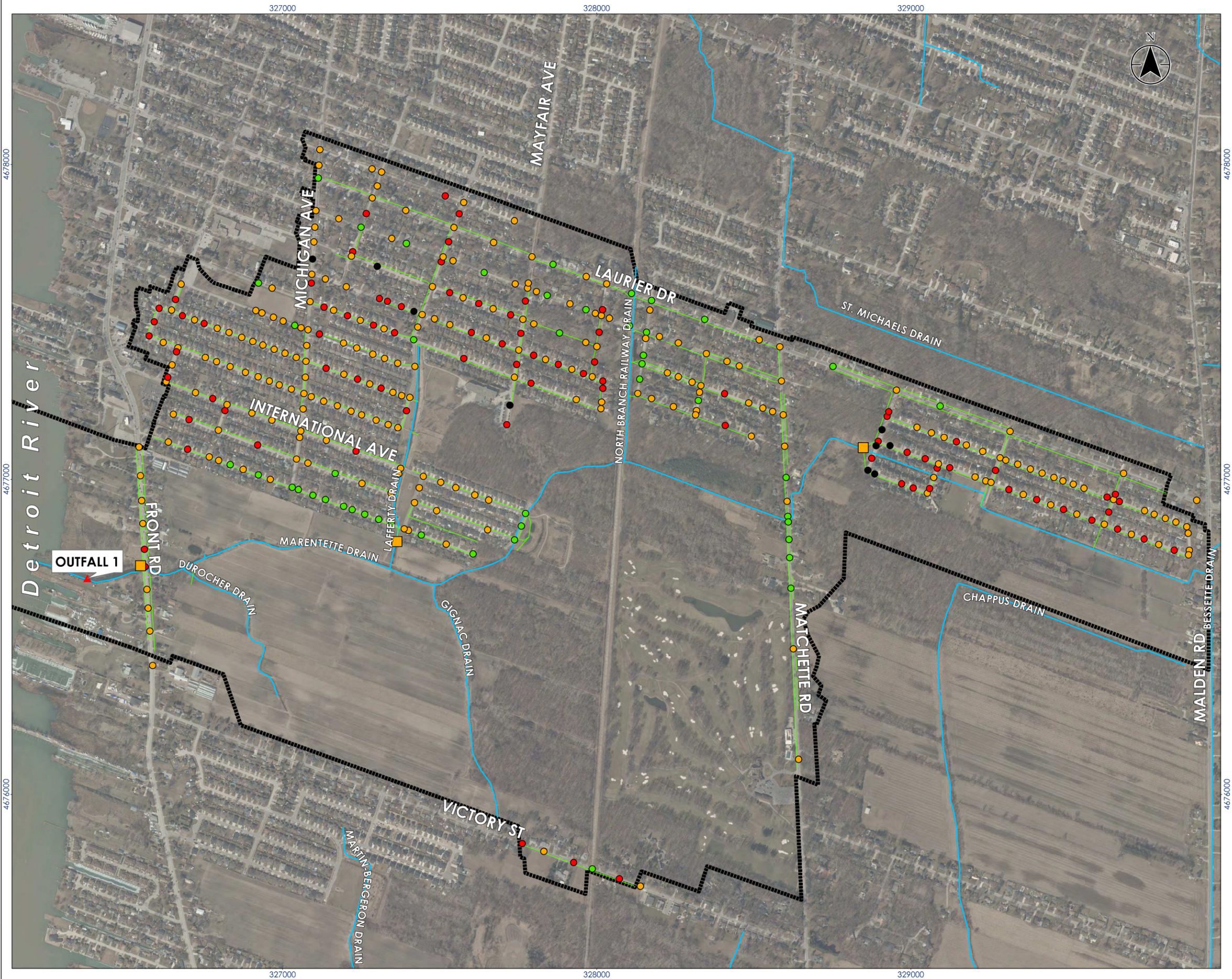


Project Location
 Town of LaSalle 161414064 REVA
 Prepared by HR on 2023-06-01

Client/Project
 LaSalle Stormwater Master Plan - Stage 2

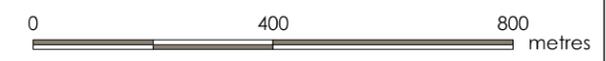
Figure No.
8.3
 Title
**Alternative 3: Pump Stations
 5-Year Rainfall Event
 2020 Detroit River High Water Level**

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 Revised: 2023-06-01 By: jpcwdfiler



Legend

- Stage 2 Study Area
 - Outfall
 - Storm Pumping Station
 - Existing Storm Sewer
 - Municipal Drains
- Road Ponding**
- Max. Depth = 0 m
 - Max. Depth <= 0.3 m
 - Max. Depth <= 0.5 m
 - Max. Depth > 0.5 m



Notes 1:6,000 (At original document size of 22x34)

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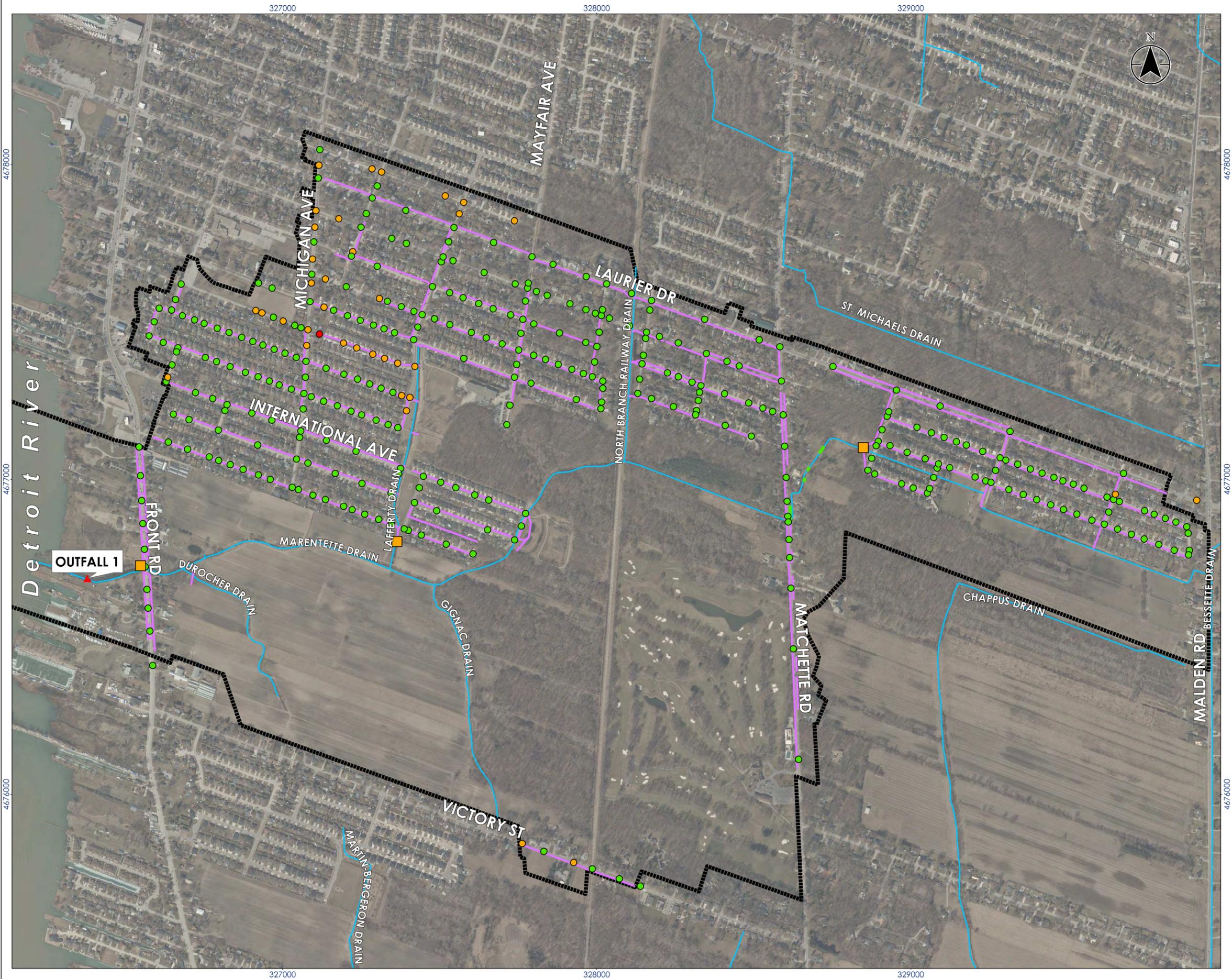


Project Location
Town of LaSalle 161414064 REVA
Prepared by HR on 2023-06-01

Client/Project
LaSalle Stormwater Master Plan - Stage 2

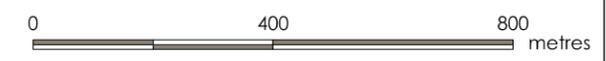
Figure No.
8.4
Title
**Alternative 3: Pump Stations
100-Year Rainfall Event
2020 Detroit River High Water Level**

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Legend

- Stage 2 Study Area
 - Outfall
 - Storm Pumping Station
 - Culvert
 - Upgraded Storm Sewer
 - Municipal Drains
- Road Ponding**
- Max. Depth = 0 m
 - Max. Depth <= 0.3 m
 - Max. Depth <= 0.5 m



Notes
 1:6,000 (At original document size of 22x34)
 1. Coordinate System: NAD 1983 UTM Zone 17N
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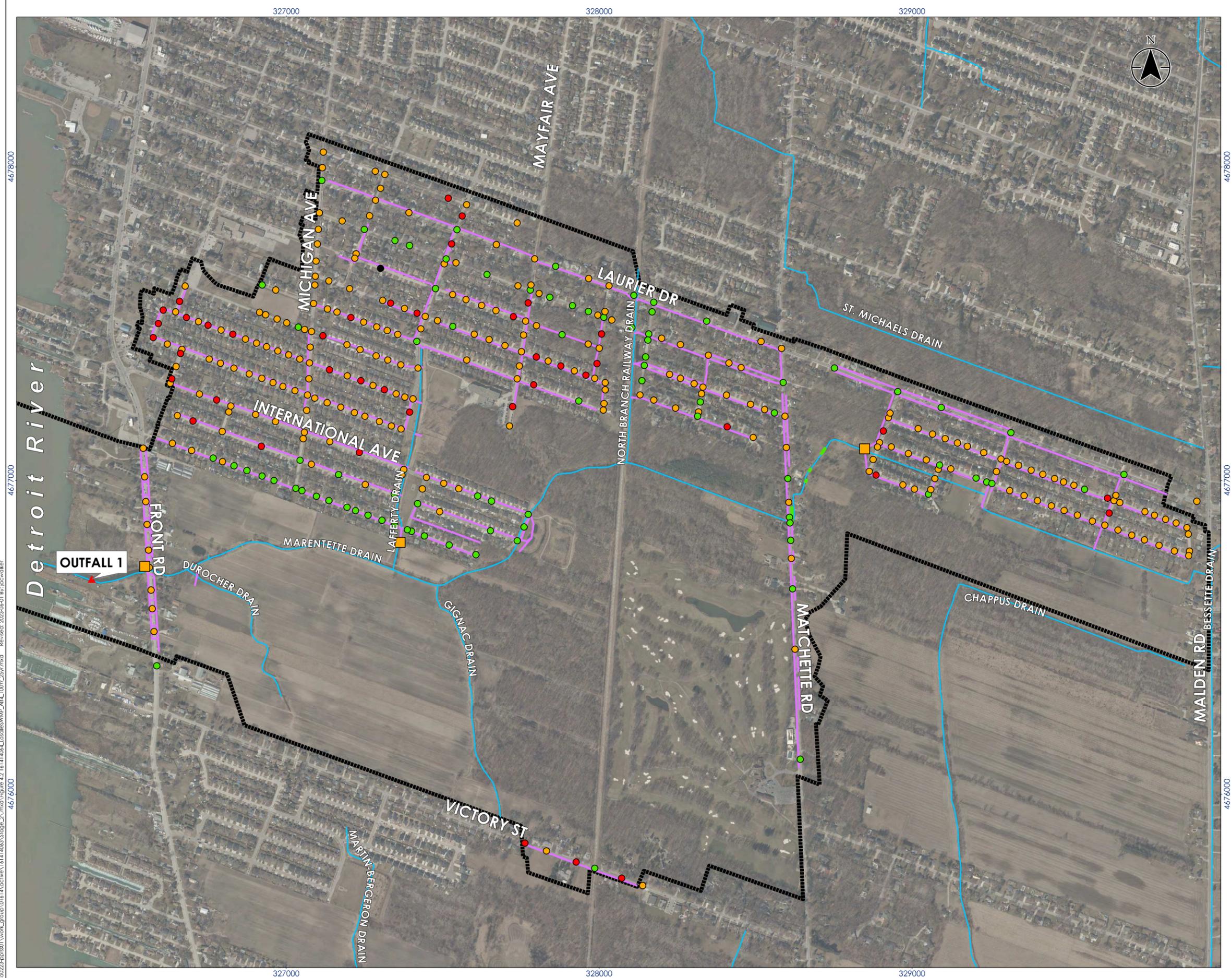


Project Location
 Town of LaSalle
 161414064 REVA
 Prepared by HR on 2023-06-01

Client/Project
 LaSalle Stormwater Master Plan - Stage 2

Figure No.
9.1
 Title
**Alternative 4: Combined Solution
 5-Year Rainfall Event
 25-Year Detroit River Water Level**

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 Revised: 2023-06-01 By: jcw/walter
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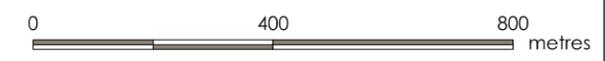


Legend

- Stage 2 Study Area
- Outfall
- Storm Pumping Station
- Culvert
- Upgraded Storm Sewer
- Municipal Drains

Road Ponding

- Max. Depth = 0 m
- Max. Depth <= 0.3 m
- Max. Depth <= 0.5 m
- Max. Depth > 0.5 m



Notes
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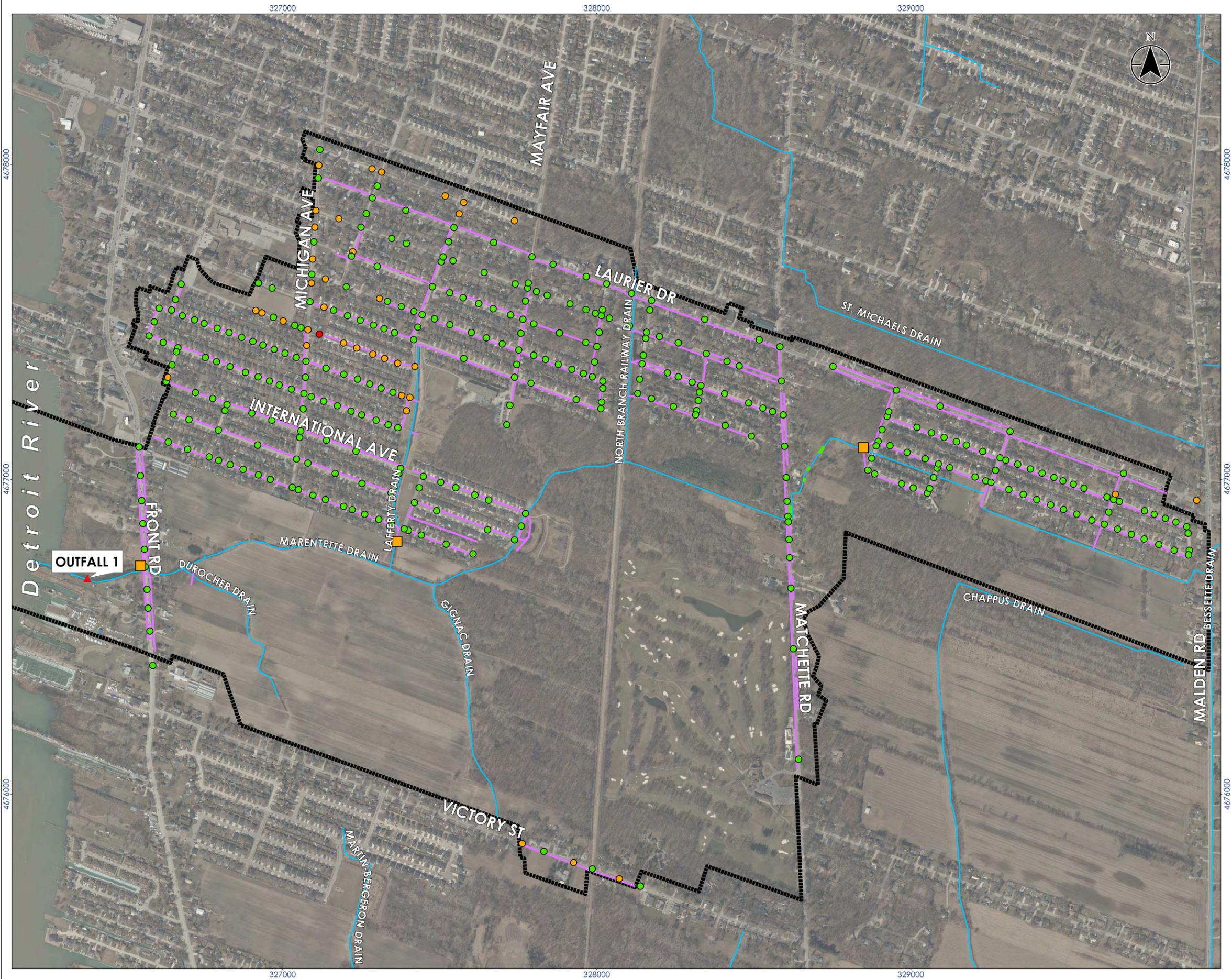


Project Location
 Town of LaSalle
 161414064 REVA
 Prepared by HR on 2023-06-01

Client/Project
 LaSalle Stormwater Master Plan - Stage 2

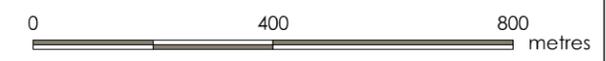
Figure No.
9.2
 Title
**Alternative 4: Combined Solution
 100-Year Rainfall Event
 25-Year Detroit River Water Level**

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Legend

- Stage 2 Study Area
 - Outfall
 - Storm Pumping Station
 - Culvert
 - Upgraded Storm Sewer
 - Municipal Drains
- Road Ponding**
- Max. Depth = 0 m
 - Max. Depth <= 0.3 m
 - Max. Depth <= 0.5 m



Notes 1:6,000 (At original document size of 22x34)
 1. Coordinate System: NAD 1983 UTM Zone 17N
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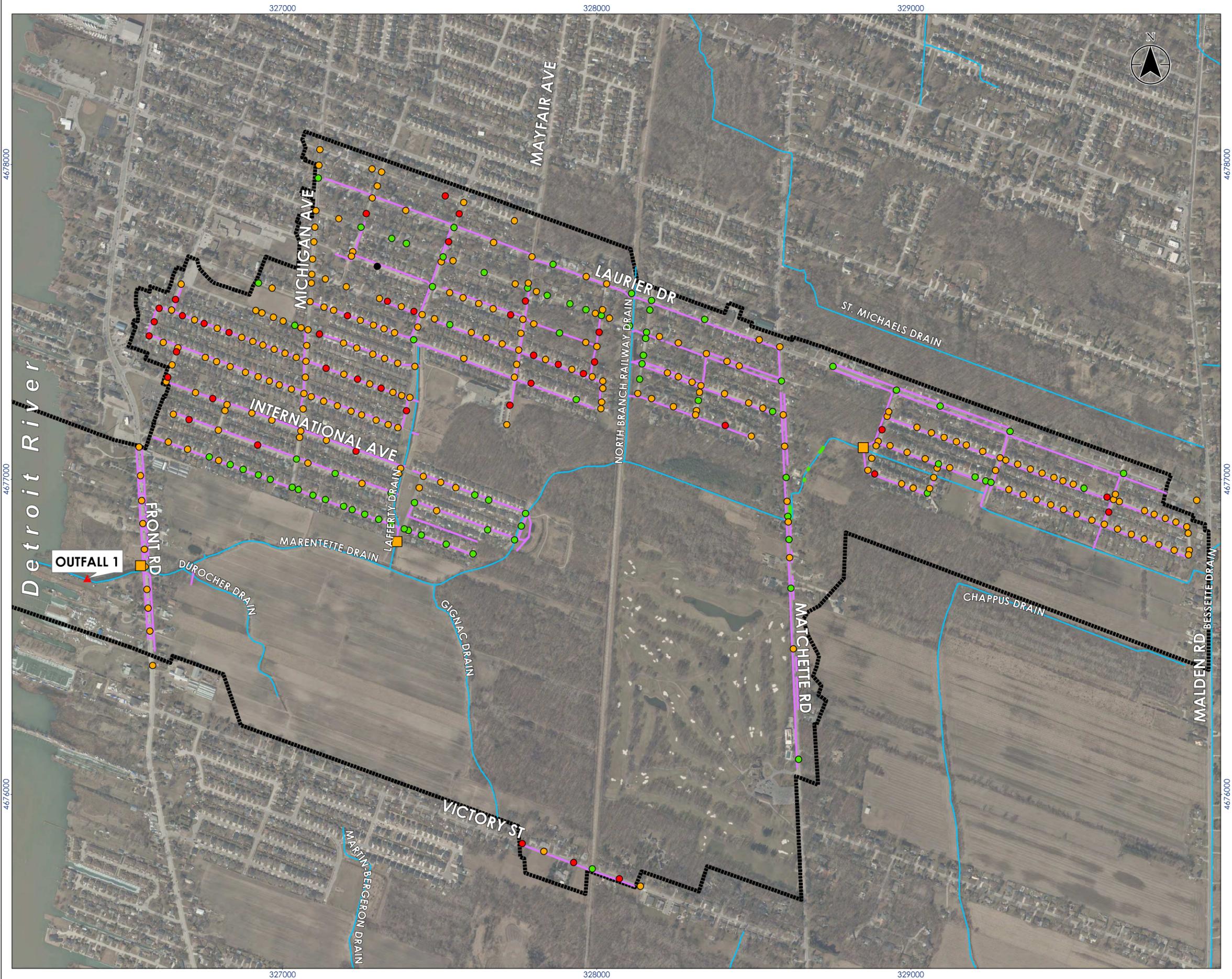


Project Location
 Town of LaSalle 161414064 REVA
 Prepared by HR on 2023-06-01

Client/Project
 LaSalle Stormwater Master Plan - Stage 2

Figure No.
9.3
 Title
**Alternative 4: Combined Solution
 5-Year Rainfall Event
 2020 Detroit River High Water Level**

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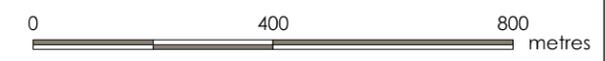


Legend

- Stage 2 Study Area
- Outfall
- Storm Pumping Station
- Culverts
- Upgraded Storm Sewer
- Municipal Drains

Road Ponding

- Max. Depth = 0 m
- Max. Depth <= 0.3 m
- Max. Depth <= 0.5 m
- Max. Depth > 0.5 m



Notes
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 1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location
 Town of LaSalle
 161414064 REVA
 Prepared by HR on 2023-06-01

Client/Project
 LaSalle Stormwater Master Plan - Stage 2

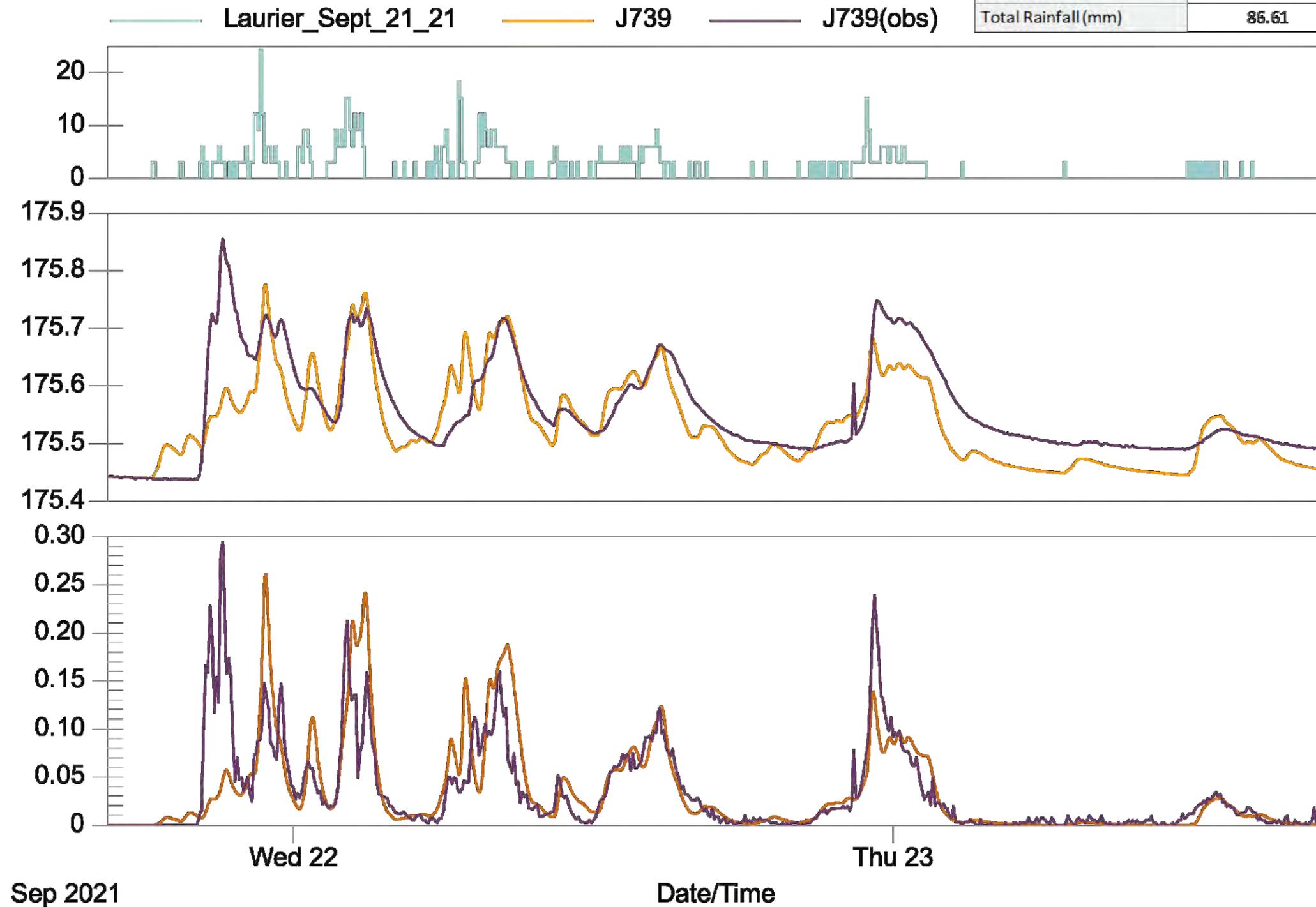
Figure No.
9.4
 Title
**Alternative 4: Combined Solution
 100-Year Rainfall Event
 2020 Detroit River High Water Level**

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 Revised: 2023-06-01 By: jrcwallier

Sacred Heart

Calibration Event - September 21, 2021

Laurier_Sept_21_21	
Maximum Rainfall (mm/hr)	24.38
Duration (hr)	71.92
Total Rainfall (mm)	86.61



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TOWN OF LASALLE
STORMWATER MASTER PLAN
STAGE 2

CALIBRATION RESULTS - SACRED HEART DR SEPTEMBER 21, 2021

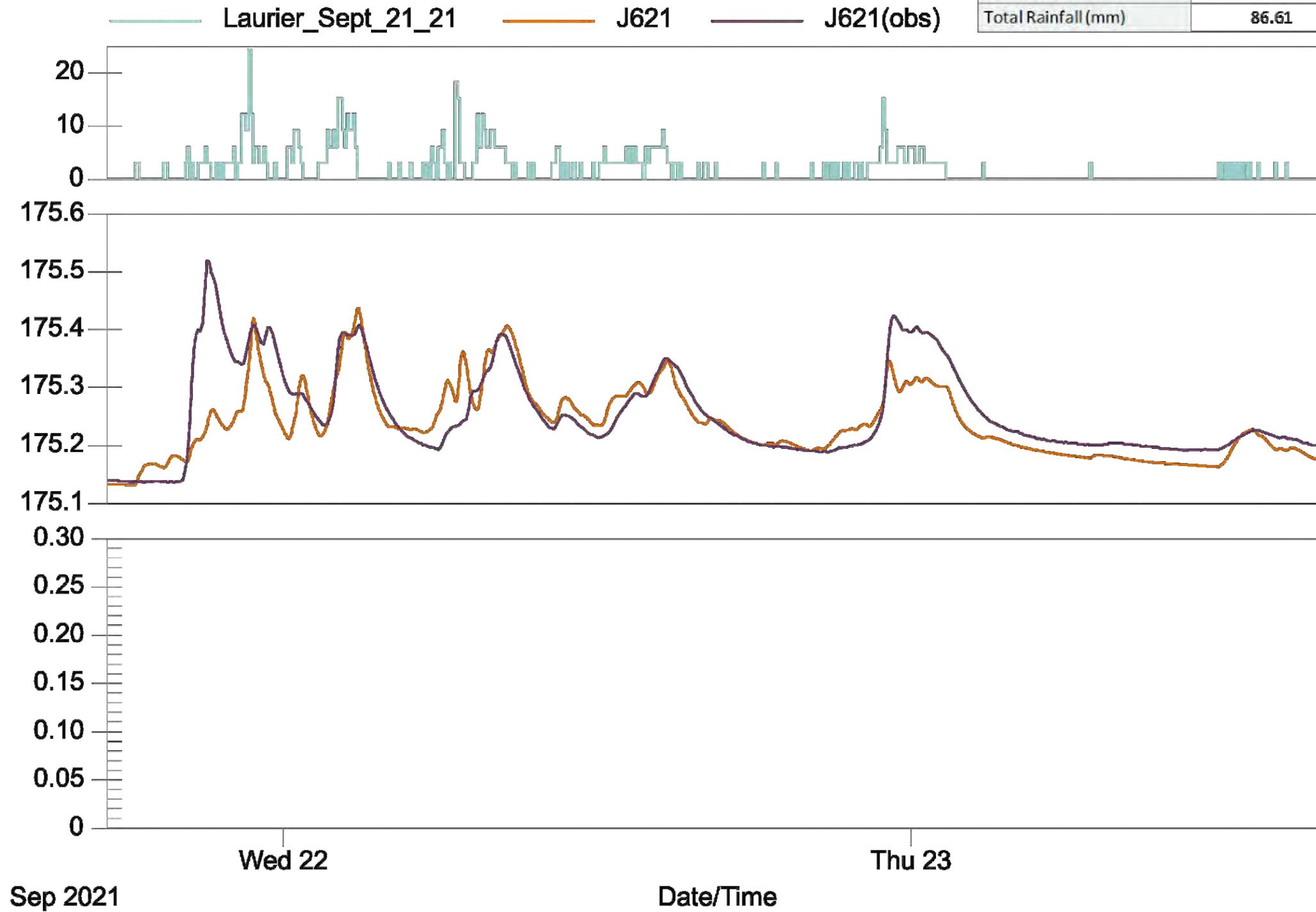
PROJECT NO.
161414064

FIGURE NO.
FIGURE 10

Alfred

Calibration Event - September 21, 2021

	Laurier_Sept_21_21
Maximum Rainfall (mm/hr)	24.38
Duration (hr)	71.92
Total Rainfall (mm)	86.61



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TOWN OF LASALLE
 STORMWATER MASTER PLAN
 STAGE 2

CALIBRATION RESULTS - ALFRED AVE SEPTEMBER 21, 2021

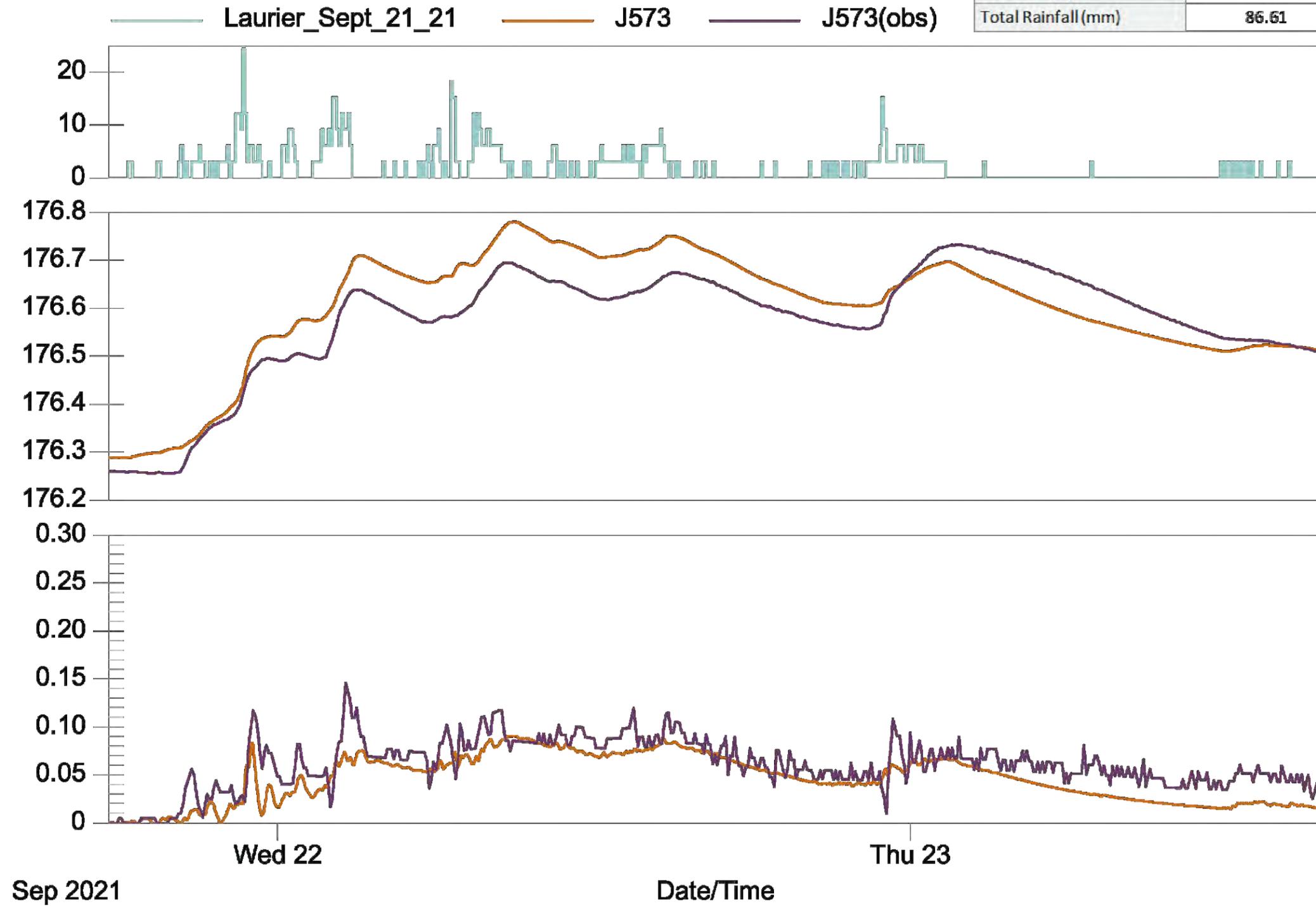
PROJECT NO.
 161414064

FIGURE NO.
 FIGURE 11

Lyons

Calibration Event - September 21, 2021

Laurier_Sept_21_21	
Maximum Rainfall (mm/hr)	24.38
Duration (hr)	71.92
Total Rainfall (mm)	86.61



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TOWN OF LASALLE
STORMWATER MASTER PLAN
STAGE 2

CALIBRATION RESULTS - LYONS AVE SEPTEMBER 21, 2021

PROJECT NO.
161414064

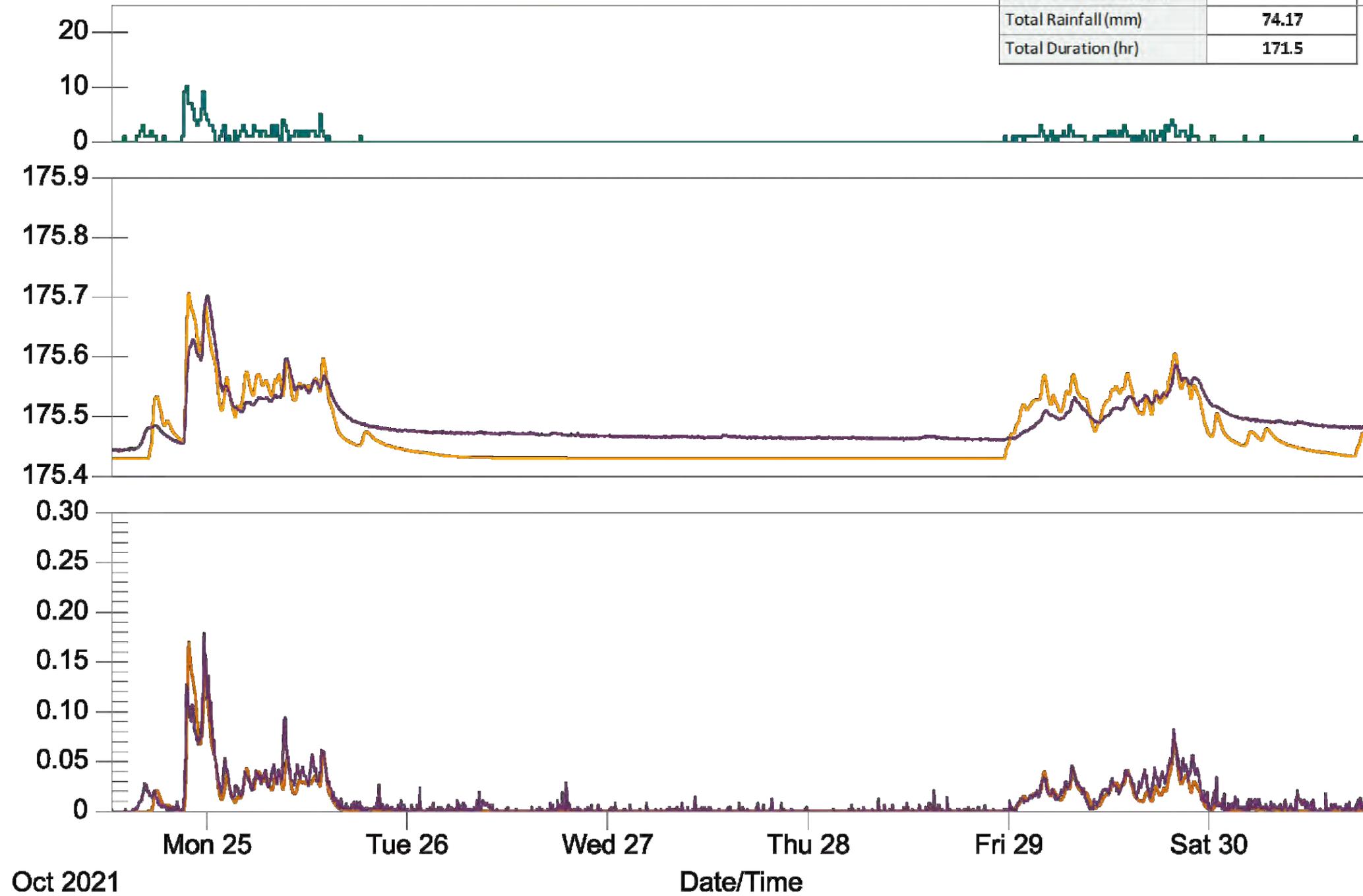
FIGURE NO.
FIGURE 12

Sacred Heart

Calibration Event - October 24, 2021 & October 29, 2021

— Laurier_Oct_24_21 — J739 — J739(obs)

	Laurier_Oct_24_21
Maximum Rainfall (mm/hr)	10.16
Oct 24th Rainfall (mm)	46.23
Oct 29th Rainfall (mm)	28.19
Total Rainfall (mm)	74.17
Total Duration (hr)	171.5



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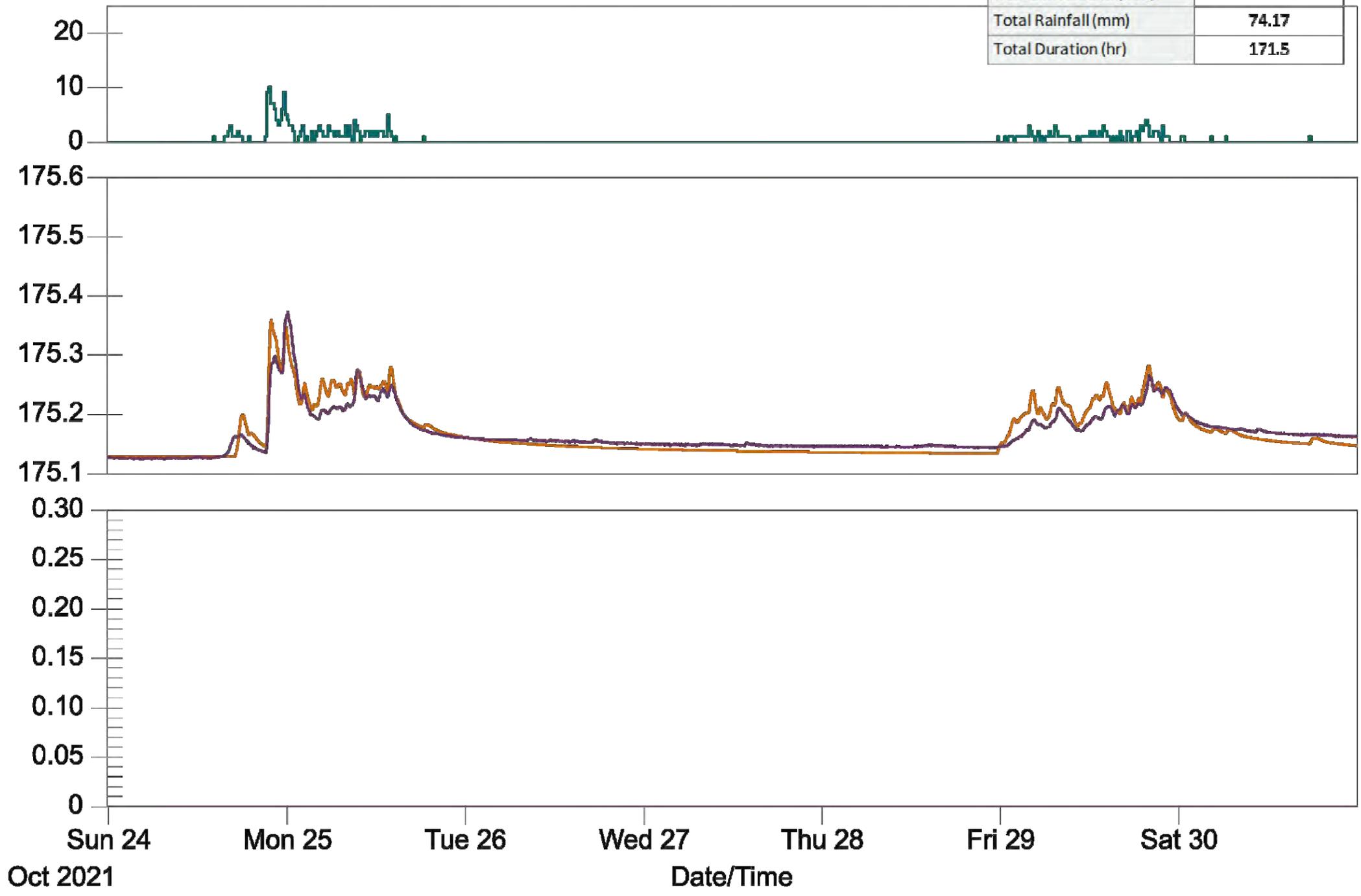
	TOWN OF LASALLE STORMWATER MASTER PLAN STAGE 2	
	CALIBRATION RESULTS – SACRED HEART DR OCTOBER 24 & 29, 2021	
PROJECT NO.	161414064	FIGURE NO. FIGURE 13

Alfred

Calibration Event - October 24, 2021 & October 29, 2021

— Laurier_Oct_24_21 — J621 — J621(obs)

	Laurier_Oct_24_21
Maximum Rainfall (mm/hr)	10.16
Oct 24th Rainfall (mm)	46.23
Oct 29th Rainfall (mm)	28.19
Total Rainfall (mm)	74.17
Total Duration (hr)	171.5



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TOWN OF LASALLE
STORMWATER MASTER PLAN
STAGE 2

CALIBRATION RESULTS - ALFRED AVE OCTOBER 24 & 29, 2021

PROJECT NO.
161414064

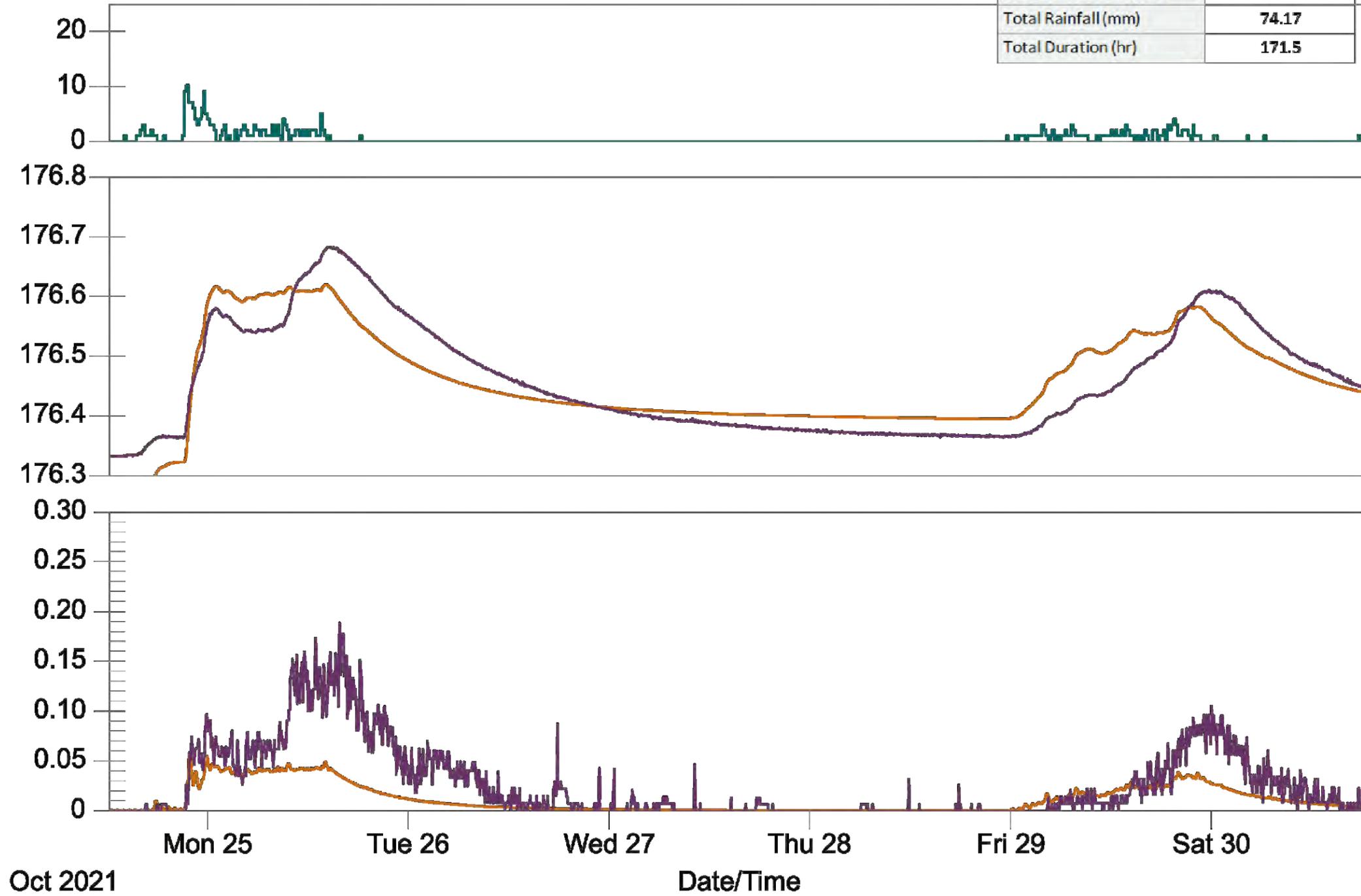
FIGURE NO.
FIGURE 14

Lyons

Calibration Event - October 24, 2021 & October 29, 2021

— Laurier_Oct_24_21 — J573 — J573(obs)

	Laurier_Oct_24_21
Maximum Rainfall (mm/hr)	10.16
Oct 24th Rainfall (mm)	46.23
Oct 29th Rainfall (mm)	28.19
Total Rainfall (mm)	74.17
Total Duration (hr)	171.5



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TOWN OF LASALLE
STORMWATER MASTER PLAN
STAGE 2

CALIBRATION RESULTS - LYONS AVE OCTOBER 24 & 29, 2021

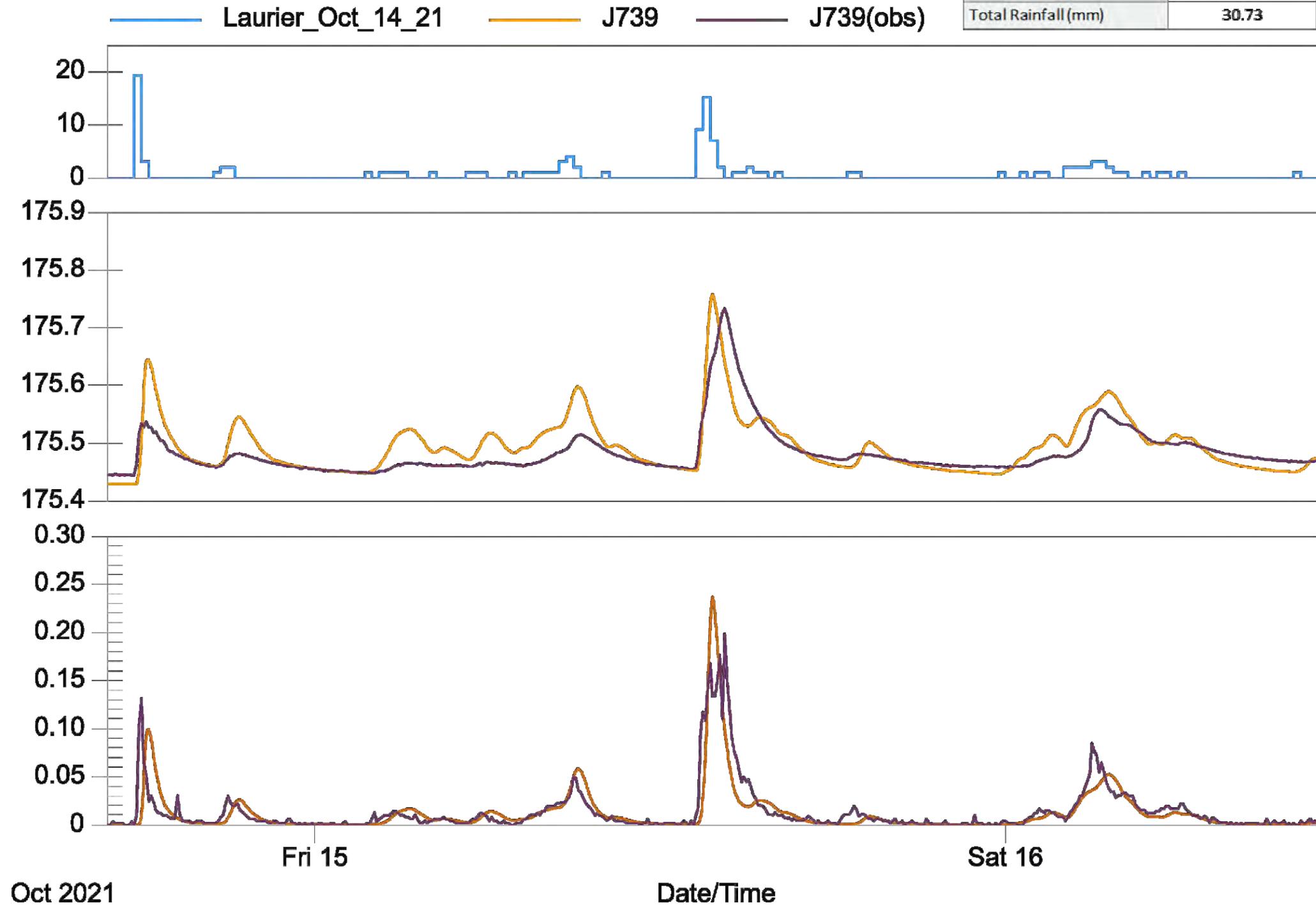
PROJECT NO.
161414064

FIGURE NO.
FIGURE 15

Sacred Heart

Validation Event - October 14, 2021

Laurier_Oct_14_21	
Maximum Rainfall (mm/hr)	19.3
Duration (hr)	42
Total Rainfall (mm)	30.73



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TOWN OF LASALLE
STORMWATER MASTER PLAN
STAGE 2

CALIBRATION RESULTS - SACRED HEART DR OCTOBER 14, 2021

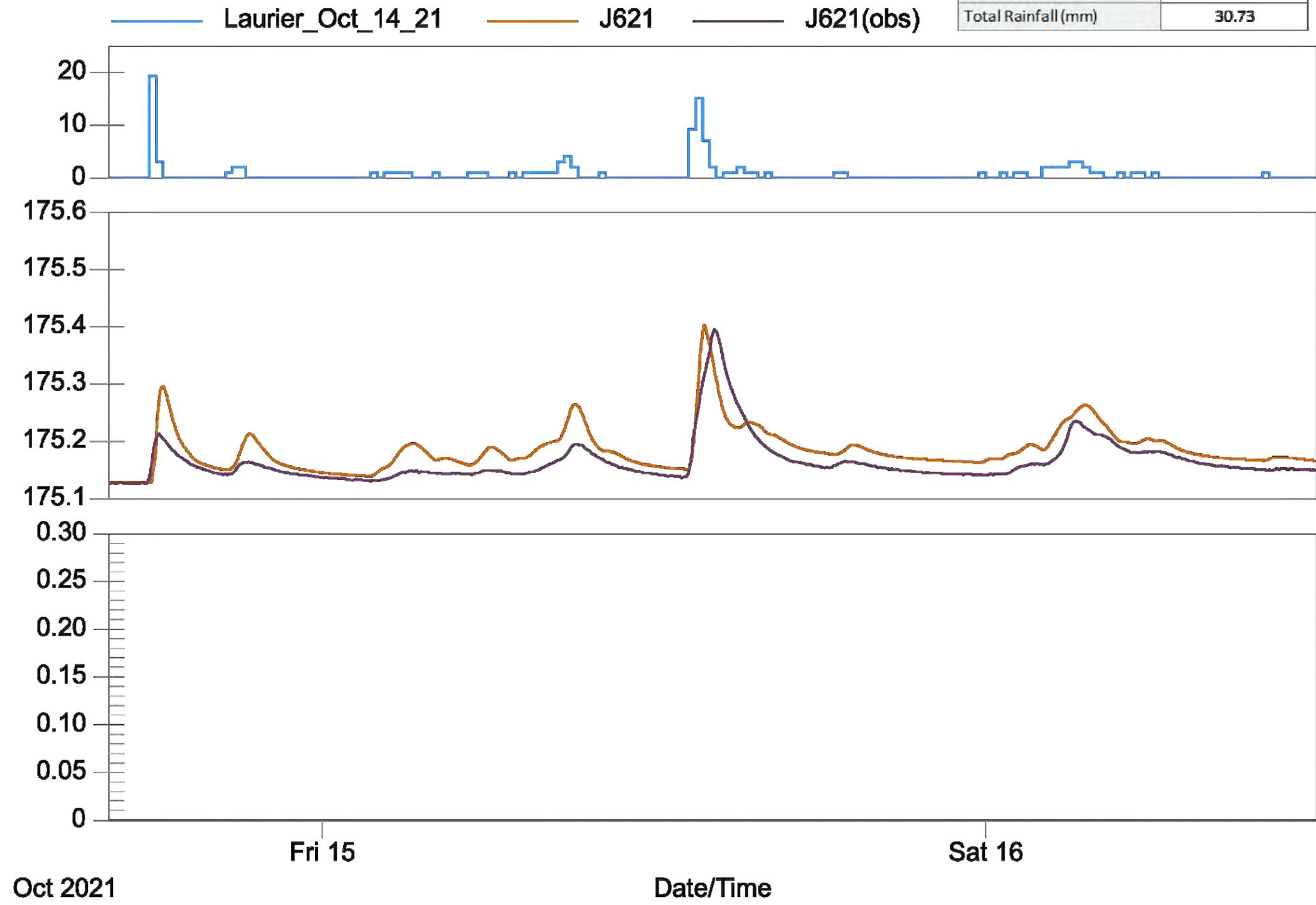
PROJECT NO.
161414064

FIGURE NO.
FIGURE 16

Alfred

Validation Event - October 14, 2021

	Laurier_Oct_14_21
Maximum Rainfall (mm/hr)	19.3
Duration (hr)	42
Total Rainfall (mm)	30.73



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TOWN OF LASALLE
STORMWATER MASTER PLAN
STAGE 2

CALIBRATION RESULTS - ALFRED AVE OCTOBER 14, 2021

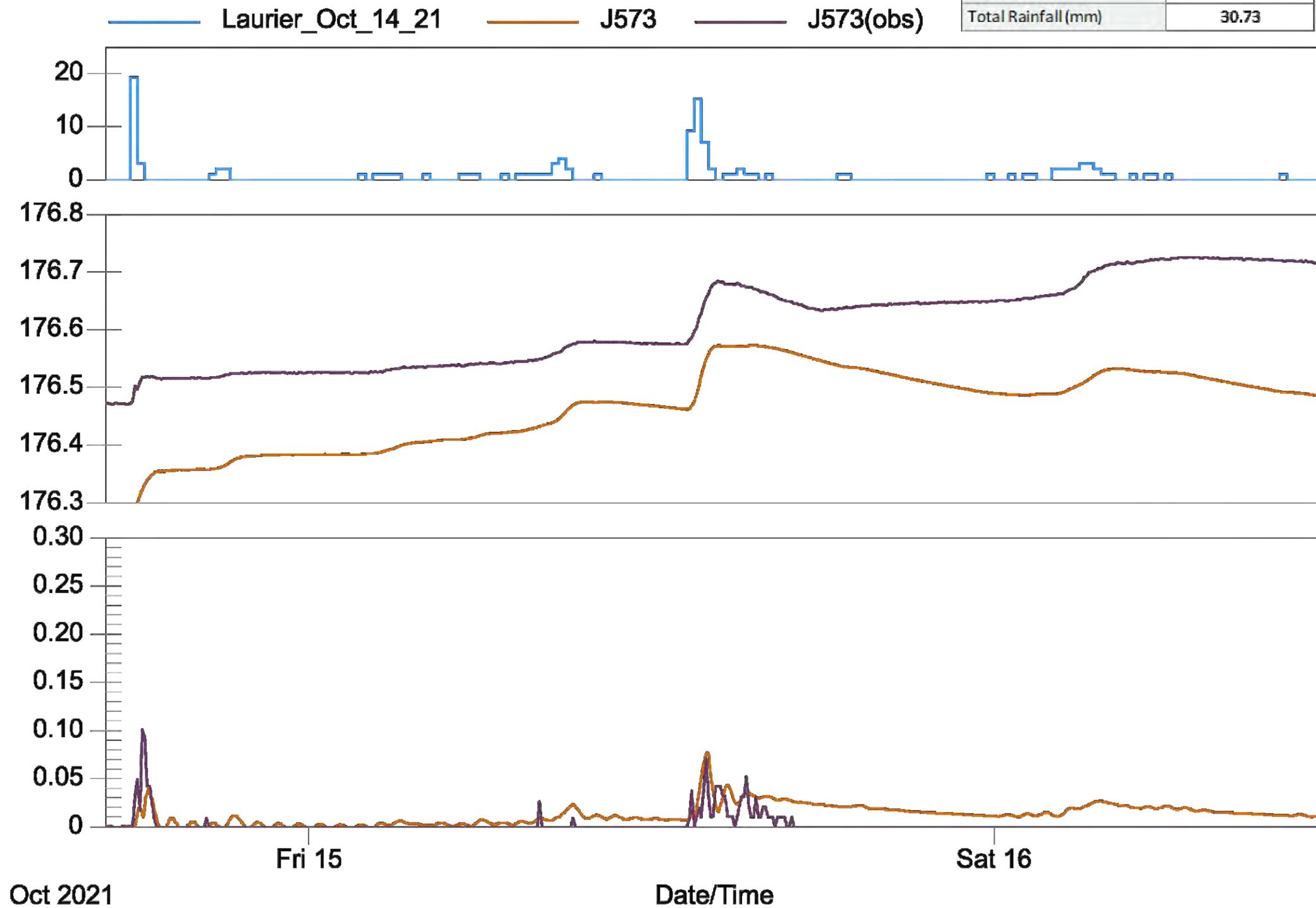
PROJECT NO.
161414064

FIGURE NO.
FIGURE 17

Lyons

Validation Event - October 14, 2021

	Laurier_Oct_14_21
Maximum Rainfall (mm/hr)	19.3
Duration (hr)	42
Total Rainfall (mm)	30.73



APPENDIX D: Opinion of Probable Cost



LASALLE SWMP ALTERNATIVE SOLUTIONS

Opinion of Probable Cost Breakdown

Project No: 161414064

Project Name: LaSalle Stormwater Master Plan - Stage 2

Date:

By: Curtis Bartlett

Notes:

Alternative 2: Upsize Sewers

Item#	Description of Work	Unit of Measure	Approx. Quantity	Unit Price	Extended Amount
1.1	300mm diameter sewers	l.m.	17	\$830	\$14,110
1.2	375mm diameter sewers	l.m.	2558	\$870	\$2,225,460
1.3	450mm diameter sewers	l.m.	254	\$920	\$233,680
1.4	525mm diameter sewers	l.m.	2356	\$1,000	\$2,356,000
1.5	600mm diameter sewers	l.m.	3632	\$1,080	\$3,922,560
1.6	675mm diameter sewers	l.m.	3768	\$1,240	\$4,672,320
1.7	750mm diameter sewers	l.m.	3556	\$1,450	\$5,156,200
1.8	900mm diameter sewers	l.m.	2414	\$1,710	\$4,127,940
1.9	975mm diameter sewers	l.m.	512	\$2,010	\$1,029,120
1.10	1050mm diameter sewers	l.m.	102	\$2,200	\$224,400
1.11	1200mm diameter sewers	l.m.	628	\$2,470	\$1,551,160
1.12	1350mm diameter sewers	l.m.	998	\$2,880	\$2,874,240
1.13	1500mm diameter sewers	l.m.	379	\$3,310	\$1,254,490
1.14	2100mm diameter sewers	l.m.	818	\$5,590	\$4,572,620
	Construction Cost Estimate (Subtotal)				\$34,214,300
	Engineering		15%	\$5,132,145	
	Contingency		30%	\$10,264,290	
	Total				\$49,610,000

Notes:

Alternative 3: Pump Stations

Item#	Description of Work	Unit of Measure	Approx. Quantity	Unit Price	Extended Amount
2.1	Pump Station #1 (Front Road)	l.s.	1	\$1,500,000	\$1,500,000
2.2	Pump Station #2 (Gary)	l.s.	1	\$7,000,000	\$7,000,000
2.3	Pump Station #3 (Lyons)	l.s.	1	\$700,000	\$700,000
	Construction Cost Estimate (Subtotal)				\$9,200,000
	Engineering		15%	\$1,380,000	
	Contingency		30%	\$2,760,000	
	Total				\$13,340,000

Notes:

1.06 cm/s flow rate
3.93 cm/s flow rate
0.45 cm/s flow rate

Alternative 5: Combined Solution

Item#	Description of Work	Unit of Measure	Approx. Quantity	Unit Price	Extended Amount
4.1	Pump Station #1	l.s.	1	\$2,300,000	\$2,300,000
4.2	Pump Station #3	l.s.	1	\$10,000,000	\$10,000,000
4.3	Pump Station #4	l.s.	1	\$2,400,000	\$2,400,000
4.4	300mm diameter sewers	l.m.	17	\$830	\$14,110
4.5	375mm diameter sewers	l.m.	2558	\$870	\$2,225,460
4.6	450mm diameter sewers	l.m.	254	\$920	\$233,680
4.7	525mm diameter sewers	l.m.	2356	\$1,000	\$2,356,000
4.8	600mm diameter sewers	l.m.	3632	\$1,080	\$3,922,560
4.9	675mm diameter sewers	l.m.	3768	\$1,240	\$4,672,320
4.10	750mm diameter sewers	l.m.	3556	\$1,450	\$5,156,200
4.11	900mm diameter sewers	l.m.	2414	\$1,710	\$4,127,940
4.12	975mm diameter sewers	l.m.	512	\$2,010	\$1,029,120
4.13	1050mm diameter sewers	l.m.	102	\$2,200	\$224,400
4.14	1200mm diameter sewers	l.m.	707	\$2,470	\$1,746,290
4.15	1350mm diameter sewers	l.m.	998	\$2,880	\$2,874,240
4.16	1500mm diameter sewers	l.m.	379	\$3,310	\$1,254,490
4.17	2100mm diameter sewers	l.m.	818	\$5,590	\$4,572,620
	Construction Cost Estimate (Subtotal)				\$49,109,430
	Engineering		15%	\$7,366,415	
	Contingency		30%	\$14,732,829	
	Total				\$71,210,000

Notes:

1.45 cm/s flow rate
5.44 cm/s flow rate
1.5 cm/s flow rate

*includes some upsized Marentette Drain culverts