



ENGINEER'S REPORT

(Drainage Act, RSO 1990, c. D.17)

PROJECT | **Langlois-Arner Drainage System and the
Colchester Heights Drainage Scheme**
(Geographic Township of Colchester South)
Town of Essex, County of Essex
Project No. D22-147

May 26, 2025

N.J. Peralta Engineering Ltd.

45 Division Street North

Kingsville, ON N9Y 1E1

519-733-6587

peraltaengineering.com

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TABLE OF CONTENTS

I.	Introduction.....	3
II.	Project Background and Watershed Characteristics.....	3
III.	Drainage History.....	5
IV.	Initial Scoping Meeting and Establishing Engineering Roles.....	6
V.	Preliminary Examination and On-Site Meeting.....	9
VI.	Area Requiring Drainage and the Validity of the Petition for the New Drainage System.....	12
VII.	Regulatory Requirements Through Environmental Agencies.....	13
VIII.	Stakeholder Consultation.....	14
IX.	Design Considerations.....	16
X.	Findings and Recommendations.....	17
XI.	Allowances and Compensation.....	24
XII.	Estimate of Cost.....	29
XIII.	Drawings and Specifications.....	36
XIV.	Construction Schedule of Assessment.....	36
XV.	Future Maintenance – Langlois-Arner Drainage System.....	37
XVI.	Future Maintenance – Colchester Heights Drainage Scheme.....	40
XVII.	Schedules of Assessment Rationale.....	42
XVIII.	Conclusion.....	43
	Construction Schedule of Assessment.....	45

TABLES

Table 1 – Scoping Meeting Attendance.....	7
Table 2 – On-Site Meeting Attendance.....	9
Table 3 - Schedule of Allowances.....	28

APPENDICES

Appendix "A" – Supporting Documents from Dillon Consulting

- Appendix A-1 – Dillon Consulting Technical Memo
- Appendix A-2 – Dillon Consulting Hydraulic Analysis
- Appendix A-3 – Draft Plan of Subdivision

Appendix "B" – Environmental Considerations

- Appendix B-1 – ERCA Correspondence
- Appendix B-2 – DFO Letter of Advice
- Appendix B-3 – MECP Endangered Species and Critical Habitat Submission

Appendix "C" – Real Estate Appraisal

Appendix "D" – Design Drawings

Appendix "E" – Future Maintenance Schedules of Assessment

- Appendix E-1 – Langlois-Arner Drainage System - Entire Drain
- Appendix E-2 – Langlois-Arner Drainage System – Downstream Portion
- Appendix E-3 – Langlois-Arner Drainage System – Upstream Portion
- Appendix E-4 – Colchester Heights Drainage Scheme – Colchester Heights Drain
- Appendix E-5 – Colchester Heights Drainage Scheme – Branch Drain
- Appendix E-6 – Colchester Heights Drainage Scheme – Outlet Portion

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Mayor and Municipal Council

Corporation of the Town of Essex
33 Talbot Street South
Essex, ON N8M 1A8

I. INTRODUCTION

In accordance with the instructions received by email on November 17, 2022, from the Town of Essex, we have completed the necessary survey, examinations, investigations, etc. and have prepared the following report that provides for the necessary improvements to ensure a sufficient outlet to facilitate the development of the Colchester Heights Subdivision within the lands currently owned by Colchester Bay Inc. (670-03703). These investigations were initiated following a resolution passed by Council, authorizing our firm to examine the necessary improvements to ensure adequate conveyance of runoff through the open channel, enhancements to the outlet structure, and the establishment of a new Municipal Drain to support the development of a proposed subdivision. All of which are in accordance with the provisions of the Drainage Act. A plan showing the alignments of the Langlois-Arner Drainage System and the new Colchester Heights Drainage Scheme, the general details of the proposed improvements, together with identifying all lands affected within the watershed of the drain is included herein as part of this report.

Colchester Bay Inc. (670-03703) submitted a Petition for a new Municipal Drain, along with a request for improvements to the existing Langlois-Arner Drainage System, to initiate an Engineer's Report in support of their property development. Our appointment and the works relative to these Municipal Drain improvements proposed under this report are being prepared in accordance with Section 78 and Section 4 of the "Drainage Act, RSO 1990, Chapter D.17, as amended in 2021". We have performed all of the necessary review, investigations, etc., for the proposed improvements to the Langlois-Arner Drainage System, and we report thereon as follows.

II. PROJECT BACKGROUND AND WATERSHED CHARACTERISTICS

Project Background

Upon receiving the appointment for this project, we also received the completed Petition Form for Drainage Works by the Owner, a formal "Request for Municipal Drain Improvements", and supporting documentation, including the notification to the local Conservation Authority. The request for improvements was specific

to the Langlois-Arner Drainage System in relation to the proposed residential development of the subject property. The Petition for a new Municipal Drain was submitted to the Town of Essex by a property owned by Colchester Bay Inc. and signed by the Director & CEO, Wing On Li. Based on the details of the Petition, the proposed Municipal Drain is intended to serve the existing 5.75 hectare (14.22 acre) property located south of County Road 50 and bounded by Ambassador Beach Road (Private) and residential lots along the east side of Santa Ana Avenue within Part of Lots 1 to 1, and Part of Lot 91, Concession 1, in the Geographic Township of Colchester South.

Based on the Draft Plan of Subdivision, the proposed development is intended to create approximately 52 residential lots with parklands and a single looped street from County Road 50. Based on the Report to Council appointing our firm, the internal storm drainage system for the proposed development shall be created as a Municipal Drain through the provisions of the Drainage Act, to service the new lots and road. Through their evaluation, the Town found that the proposed residential development may have a direct impact on the receiving drainage system, the Langlois-Arner Drainage System. As a result, the Owner petitioned for a new Municipal Drain and further requested improvements to the Langlois-Arner Drainage System to facilitate this development.

The dialogue and information gathered helped us understand the general history and the purpose of the request for drainage improvements by the Owner. It further demonstrated the reason for the submitted Petition pursuant to Section 4(1)(a) and/or (b), in accordance with the "Drainage Act, RSO 1999, Chapter D. 17, as amended 2021".

Watershed Characteristics

The Langlois-Arner Drainage System is a Municipal Drain consisting of both an open channel and a tiled drainage system. It begins at the midpoint of Lot 88, Concession 1, as a tiled system that flows in a southwesterly direction through private lands. This tiled portion terminates north of County Road 50, where the system transitions into an open channel configuration. The open channel continues southwesterly, crossing County Road 50 and Ambassador Beach Road (Private), and eventually becomes an enclosed system at the southern portion of Ambassador Beach Road. From there, it continues through private lands before discharging into Lake Erie. The Langlois-Arner Drainage System is designed to provide a sufficient legal outlet for the lands and roads affected within the Town of Essex.

The Langlois-Arner Drainage System encompasses an irregularly shaped watershed covering approximately 124 hectares (306 acres) of land. The majority of the watershed area lies upstream of County Road 50 and is primarily used for agricultural production. Downstream of County Road 50, land use transitions predominantly to residential. The watershed terrain is relatively modest but offers good topographic relief, with an average gradient of approximately 0.53% sloping in a southwesterly direction. The project area is primarily underlain by Perth Sandy Loam, with localized areas of Wauseon Sandy Loam. These soil types fall within Hydrologic Soil Group C, which is characterized by low to very low infiltration rates when saturated. Such soils typically include a layer that impedes the downward movement of water and have moderately fine to fine textures. Consequently, artificial sub-surface drainage is generally required for these soils to support productive land use.

III. DRAINAGE HISTORY

From our review of the Town of Essex's drainage records, we found various Engineer's Reports prepared through the provisions of the Drainage Act for the Langlois-Arner Drainage System. Based on this information, we have utilized the following relevant Engineer's Report as a reference for carrying out this project:

Langlois-Arner Drainage System

- a) **April 10, 1940**, Engineer's Report for the "Langlois-Arner Drain", prepared by J.J. Newman, Township Engineer, carried out through the Township of Colchester South By-Law No. 461. This report serves as the initial By-Law, as petitioned for by the affected landowners, which provided for the establishment of the Municipal Drain, through the provisions of the Drainage Act. The improvements completed under this report included the deepening of the open drain upstream of the outlet enclosure pipe, crossing Ambassador Beach Road and County Road 50. North of County Road 50, a new tile drain was installed to its top end within Lot 88. These improvements included the installation of catch basins throughout and a concrete headwall at the upstream end of the open drain portion.
- b) **September 8, 1958**, Engineer's Report for the "Langlois Arner Drain", prepared by C.G.R. Armstrong, P.Eng. This Report identified the inadequacy of the existing tiled outlet and recommended the installation of an auxiliary drainage outlet, together with general improvements to the existing drainage outlet. However, further to our review of the Town's records, we understand that a letter from the Clerk, dated October 7, 1958, outlined that the proposed auxiliary outlet was rejected by the drainage scheme.
- c) **November 9, 1984**, Engineer's Report for the "Maintenance Schedule Langlois-Arner Drainage System", prepared by N.J. Peralta, P.Eng., was carried out through the Township of Colchester South By-Law No. 1706. This report generally provides for the reassessment of costs for the Langlois-Arner Drainage System, so that costs for future maintenance works on this drain may be fairly assessed. This report provided two (2) separate maintenance schedules for the portion outlined within the 1940 report, and the outlet portion of the Langlois-Arner Drainage System.
- d) **September 27, 2011**, Engineer's Report for the "Langlois-Arner Drainage System", prepared by G. Rood, P.Eng., carried out through the Town of Essex By-Law No. 1114. The improvements completed under this report included the repair and improvements to the outlet portion of the Municipal Drain, downstream of Ambassador Beach Road. These improvements included the upstream and downstream extension of the outlet pipe through private lands, outlet protection measures at Lake Erie, together with the expansion of the open drain cross-section and the extension of the existing east berm located between both ends of the Ambassador Beach Road.

From our detailed research of the above Engineer's Reports, we have determined that the Langlois-Arner Drainage System has been designated as a Municipal Drain through the provisions of the Drainage Act. The entire length of this Municipal Drain has been defined and governed by the portions of 1940, and 2011 Engineer's Reports and By-Laws and extends from Station 0+000.0 to approximately Station 1+818.1.

As it relates to the area of land contributing to this drainage system, the 1984 and 2014 reports would encompass the entire watershed boundary limits contributing flows to the Langlois-Arner Drainage System from the upstream lands. As such, these reports were utilized as a starting point in establishing the area of land contributing to the proposed improvements and establishing the distribution of all future maintenance costs. Furthermore, we have also researched and reviewed several governing reports for all abutting watersheds to confirm all changes for the completion of the necessary analysis and determinations that formed part of this project.

Bellcreeft Beach Diversion Drain

- a) **June 17, 2016**, Engineer's Report for the "Bellcreeft Beach Diversion Drain", prepared by G. Rood, P.Eng., carried out through the Town of Essex By-Law No. 1553. The improvements completed under this report included the construction of a new diversion drain designed to redirect flows from the upstream portions of the Bellcreeft Beach Drains No. 1 and No. 2. This was done to reduce the risk of flooding to the original receiving drainage system and pump station. The work involved the installation of a new berm and open channel north of County Road 50, a new road crossing, and a twinned covered drain through the subject property, which discharges into Lake Erie via outlet pipes and a baffle system.

As it relates to the Bellcreeft Beach Diversion Drain report, this diversion drain currently resides along and within the west limit of the subject development property. At the south limit of the subject property, within the alignment of the diversion drain, a berm has been installed to reduce surcharging impacts to the adjacent lands.

IV. INITIAL SCOPING MEETING AND ESTABLISHING ENGINEERING ROLES

Prior to our appointment to this project, the Town of Essex had submitted a notice to the Essex Region Conservation Authority (ERCA) for comments and concerns related to the requested works on the Langlois-Arner Drainage System. Upon our appointment and based on these comments, we felt that it would be prudent to arrange an initial Scoping Meeting with pertinent stakeholders to review the initial comments and obtain a better understanding of the project scope. Subsequently, the initial Scoping Meeting was scheduled for December 13, 2022. The following people were in attendance at this meeting:

Table 1 - Scoping Meeting Attendance

Name	Affiliated Property
Kyle Edmunds	Dillon Consulting (Representing the Developer)
Stefano Forest	Dillon Consulting (Representing the Developer)
Melanie Muir	Dillon Consulting (Representing the Developer)
James Michener	Dillon Consulting (Representing the Developer)
James Bryant	Essex Region Conservation Authority
Tian Martin	Essex Region Conservation Authority
Ashley Gyori	Essex Region Conservation Authority
David McBeth	Town of Essex
Kevin Girard	Town of Essex
Lindsay Dean	Town of Essex
Tony Peralta	N.J. Peralta Engineering Ltd.

The following information was discussed:

1. Upon introduction, Tony Peralta provided a general review of the history of the Langlois-Arner Drainage System. This drainage system has a history of flooding concerns dating back to the 1940s, where various improvements have been presented to the affected landowners. Most notably, the 1958 report addressed concerns with the existing outlet and further recommended improvements to the outlet by installing an auxiliary outlet. These recommendations were ultimately rejected by the watershed. With ongoing issues over the years, a report was prepared in 2011 to address improvements to the outlet portion of the drainage system. Based on the disparity within the watershed, these improvements had a limited level of service to minimize costs to the watershed. As a result, the 2011 recommendations would not meet the current requirements for a major flow event established within the Windsor/Essex Region Stormwater Management Standards Manual.
2. Kyle Edmonds provided a summary of the proposed development and outlined the need for drainage improvements. Based on dialogue with Town Staff, it was established that drainage improvements would be required to facilitate the development of the subject lands. With the property residing directly adjacent to and utilizing the Langlois-Arner Drainage System as its primary drainage outlet, it was determined that drainage improvements would be required, and these improvements shall proceed through the provisions of the Drainage Act.
3. Tony Peralta provided context related to his appointment and his responsibilities under the Drainage Act. It was discussed that the project scope was not only to address improvements to the Langlois-Arner Drainage System to facilitate the development of the subject lands but also to incorporate the internal drainage system of the development as a Municipal Drain. By incorporating the drainage system as a Municipal Drain, the Town would have the means to address future maintenance and allocate future maintenance costs to all affected lands and roads.
4. Based on the initial comments provided by the ERCA, it was understood that the proposed development shall not create any negative impacts upstream and downstream of the development site. It was further identified that the development site and adjacent lands are low-lying valley lands that currently act as a floodplain for the entire drainage system, impacted by lake effects. The development site is also located within the 1:100-year floodplain of the drainage system that is currently regulated by the ERCA. Based on this information, ERCA clarified that a hydraulic analysis

should be conducted to consider the capacity of the outlet and to ensure that no negative impacts are created by the proposed development relative to the regulated 1:100-year storm event flows.

5. Tony Peralta reviewed the details of the submitted Petition and outlined that the submission appeared to be incomplete. He further requested that the form be re-submitted to include all pertinent information.
6. Tony Peralta further re-iterated the role of the appointed Engineer. Although the developer is a landowner within the watershed, under Section 11 of the Drainage Act, the Engineer shall "... to the best of the Engineer's skills, knowledge, judgment and ability, honestly and faithfully, and without fear of, favour to or prejudice against any person, perform the duty assigned to the engineer ...". As a result, Tony confirmed that the improvements conducted under this project shall consider the best interests of the entire watershed and the land affected by the proposed works.
7. With Dillon Consulting (Dillon) engaged as the Developer's engineer, they will be required to conduct extensive analysis and design to support the development of the proposed residential subdivision. As a result, we discussed general engineering roles towards the completion of the project. All parties agreed that it would be most advantageous to have Dillon continue with the hydraulic modelling and analysis to satisfy the requirements for the development and the Langlois-Arner Drainage System improvements. Furthermore, with the design aspect of the improvements closely tied to the drain analysis, the Town felt that in order to expedite and reduce overall costs on the project, it would be beneficial to all parties that Dillon also carry out the design improvements. This design analysis would satisfy the Town and regulatory requirements of the development and the overall drainage system. With Tony Peralta appointed by Council as the Engineer of Record, Dillon would collaborate with N.J. Peralta Engineering Ltd. (Peralta), to ensure that all matters related to the overall drainage system are addressed and the improvements satisfy the requirements of the Drainage Act. In order to clearly define Dillon's role on the project, the following provisions were agreed upon, but not limited to:
 - a. Peralta would be the "Engineer of Record" as it relates to works under the Drainage Act.
 - b. As the appointed engineer under the Drainage Act, Peralta's role is to act on behalf of all affected landowners within the drainage scheme, ensuring a fair and equitable solution for the entire watershed, not solely for the benefit of the developer.
 - c. Dillon's role is to support Peralta by providing the necessary technical analysis and design, as well as assisting in obtaining the required approvals to address the needs of both the watershed and the developer.
 - d. Dillon shall provide a "technical memo" outlining the hydraulic analysis, design details, and design rationale for the proposed improvements, together with all supporting documentation (i.e. drawings, details, construction specifications, cost estimates, etc.). These documents shall form part of the Engineer's Report prepared by Peralta.
 - e. Dillon shall obtain all necessary design approvals related to the development and the Langlois-Arner Drainage System improvements from the Town and regulatory bodies.
 - f. Peralta shall incorporate Dillon's design and technical memo as part of the Drainage Report, through the provisions of the Drainage Act.
 - g. Dillon shall provide technical support at all public meetings.

Based on the details above, it was further established that the Engineer's Report, through the provisions of the Drainage Act, could not proceed until all pertinent details have been approved by the Town and regulatory authorities (specifically the ERCA).

8. It was further clarified that Peralta will not act as a peer reviewer for the development, but rather conduct a review of the design as it relates to the safe-guarding of the watershed and requirements through the provisions of the Drainage Act.

Based on the details outlined within this meeting, all parties were in general agreement with the intended direction towards facilitating the necessary improvements to the Langlois-Arner Drainage System and the creation of a new Municipal Drain to facilitate the proposed residential development within the subject property. With the general understanding from each party, it was established that there is sufficient information to proceed with the required On-Site Meeting process with all stakeholders within the drain's watershed.

V. PRELIMINARY EXAMINATION AND ON-SITE MEETING

Following our review of the drainage information provided by the Town of Essex, the initial scoping meeting, and receipt of the revised Petition form, we scheduled an On-Site Meeting for January 11, 2023, at the west end of Ambassador Beach Road, near the outlet of the Langlois-Arner Drainage System. The following people were in attendance at this meeting:

Table 2 - On-Site Meeting Attendance

Name	Affiliated Property
Nancy Hughes & Jonathan Straw	Landowners – 100 Santa Ana Avenue
Richard Martin	Landowner – 663 Ambassador Beach Road
Debra & Greg Vermette	Landowners – 130 Santa Ana Avenue
Dennis Tuffin	Landowner – 110 Santa Ana Avenue
Gary & Jeanette Desjardins	Landowners – 140 Wilshire Place
Jim Wright	Landowner – 147 Santa Monica Boulevard
Cathy Georges	Landowner – 132 Bondy Lane
Peter Berg	Landowner – 609 County Road 50
Mark Fishleigh	County of Essex
Brad Allard	Town of Essex
Rob Shepley	Town of Essex
Lindsay Dean	Town of Essex
David McBeth	Town of Essex
Stefano Forest	Dillon Consulting
Tony Peralta	N.J. Peralta Engineering Ltd.

The following information was discussed:

1. Upon introductions, it was generally discussed that drainage improvement requests have been submitted to the Town of Essex. These requests include:

- a. A Section 4 Petition to construct a new Municipal Drain to facilitate the development of the Colchester Heights Residential Subdivision. This proposed drainage system is intended to have a direct outlet to the Langlois-Arner Drainage System.
 - b. A Section 78 Request for Improvements to the Langlois-Arner Drainage System as a direct result of the impacts of the residential subdivision and to ensure a sufficient outlet is maintained for the entire drainage system.
2. Tony Peralta further explained that a Municipal Drain is a communally accepted and owned drainage infrastructure that has been created through the provisions of the Drainage Act of Ontario. This Act provides for a democratic procedure for the construction, improvement, and maintenance of the drainage works. A Municipal Drain is adopted, administered, and maintained through Municipal By-Law. Therefore, once adopted as a Municipal Drain, the By-Law provides the Town with the authority to enter private lands, as the caretaker of the communal infrastructure. The Town's role is to ensure the drain is kept up and maintained on the watershed's behalf.
3. Tony Peralta further explained the purpose of the "On-Site Meeting". He explained that this meeting is a mandatory requirement of the Drainage Act and is intended to be the initial step in the process to provide a general introduction to the project and to help establish a general scope of work based on the submitted requests and subsequent discussions of this meeting.
4. Tony Peralta identified that this meeting was intended to address the necessary drainage improvements requested and required for development. As such, Tony Peralta reviewed the Petition brought forward and discussed the general area that requires drainage. He then proceeded to discuss the Drainage Act process, the Engineer's Report, required public meetings and appeal processes.
5. Tony Peralta elaborated on the engineering roles for this project. He explained that he was appointed by the Town of Essex, through the provisions of the Drainage Act, to prepare an Engineer's Report for the necessary improvement required to facilitate the development of the residential subdivision. Dillon Consulting has been hired by the developer to provide all engineering and planning services for the development of the residential subdivision. With Dillon's direct involvement in the extensive design and analysis to support the development, it would be most advantageous to have Dillon continue with the hydraulic analysis and design to satisfy the drainage requirements for the development and the Langlois-Arner Drainage System improvements. Dillon's analysis and design will still be reviewed and approved by the regulatory bodies prior to incorporating this information as part of the Engineer's Report through the provisions of the Drainage Act.
6. Tony Peralta shared the general history of the Langlois-Arner Drainage System and outlined the various reports that govern the entire length of the Municipal Drain. From this review, it was determined that the 2011 report was the last time improvements were captured in a report. The 2011 report provided for improvements to the outlet portion of the drain to address flooding concerns. The works conducted included improvements to the outlet pipe and enhancements to the open channel immediately upstream of the outlet pipe. These improvements provided a limited level of service in an attempt to provide an enhanced level of protection without exorbitant costs.

7. Tony Peralta advised that this project is under the jurisdiction of the Department of Fisheries and Oceans (DFO), the Essex Region Conservation Authority (ERCA), and the Ministry of Natural Resources (MNR). The ERCA had already provided their initial comments related to the project. However, further consultation with all agencies will be required.
8. Tony Peralta further explained that through the provisions of the Drainage Act, landowners who contribute to and/or benefit from the drainage works are assessed their fair share of the project costs. Based on the initial scope of work focussed on the drainage system for the development and the necessary improvements to the Langlois-Arner Drainage System to facilitate the development, assessments are likely to be levied to the development property. However, if additional works are requested to expand the scope of work, these costs may be appropriated and assessed to the affected landowners. Allowances may be allocated to landowners to accommodate for the lands required to establish access, maintenance corridors, and damages inflicted on the affected lands as part of the overall works. The landowners were advised that, at this early stage of the project, the scope, analysis, and design have yet to be considered. Therefore, the details and potential costs associated with the project have yet to be established. Although likely that the costs associated with the intended scope are to be assessed for the development, the report shall include provisions for future maintenance and associated costs to all affected landowners.
9. Tony Peralta opened up discussions with the landowners and requested that they provide their comments and concerns regarding the Langlois-Arner Drainage System, as it relates to this overall project. He further explained that the information shared at this meeting will help establish the overall scope and direction of this project. He reiterated that this meeting is specific to the necessary drainage improvements and that answers related to the proposed development may not be available.
10. Lindsay Dean identified that Ron Pniewski (671 and 673 Ambassador Beach Drive) was unable to attend this meeting. However, he provided the Town with his comments and concerns. He primarily expressed his concerns with the ongoing flooding issues the area has endured over the years and wanted to ensure that any proposed development should not exacerbate the current conditions.
11. Several landowners within the Bellcreeft Beach Drainage System inquired whether the proposed development and drainage improvements would impact their drainage system. Tony Peralta explained that although the Bellcreeft Beach Drainage System and the Langlois-Arner Drainage System are adjacent to each other, they operate as separate and independent drainage systems. Those landowners within the Bellcreeft Beach Drainage System have primarily been invited to this meeting as a courtesy for informational purposes and may not be involved in the final drainage improvements.
12. Some landowners had expressed some concerns with the extent of the watershed for the Langlois-Arner Drainage System and felt that there may be an overlap in the governing reports between the two watersheds. Tony Peralta identified that as part of his process, he will be verifying the extent of the watershed, and updated maintenance schedules will likely be required as part of this project to accurately reflect the lands within the affected watersheds.

13. Dennis Tuffin (110 Santa Ana Avenue) inquired about the differences in design standards between the existing works and the proposed improvements intended to accommodate the development. Tony Peralta explained that the previous improvements to the Langlois-Arner Drainage System and the Bellcreeft Beach Drainage System were conducted based on the existing conditions and a level of service commensurate with a reasonable cost-benefit. With the proposed drainage improvements required to facilitate the development of the subject lands, the development will be required to meet the current regional design standards related to development.
14. Some residents inquired about how the project scope could change. Tony Peralta clarified that the initial scope of this project is to focus on the necessary improvements to facilitate the development of the subject lands. However, if further improvements or enhancements to the drainage system were requested outside of the proposed development, these works would be in addition to the development scope, and such costs would likely be shared with all lands and roads that contribute to and/or benefit from these works.
15. Richard Martin (663 Ambassador Beach Road) had identified that in the past, the configuration of the outlet pipe caused flooding within the system. Since the work conducted in 2011, some of the flooding has subsided, and he wanted to know if these conditions would further improve when the proposed development improvements are implemented. Stephano Forest confirmed that the proposed drainage improvements for the development will likely translate to overall improvements to the entire system.
16. Dennis Tuffin (110 Santa Ana Avenue) questioned whether the Langlois-Arner Drainage System will continue to function as a gravity outlet or will a pump station will be introduced to the system. He further expressed concerns about sand buildup at the outlet and asked whether a pump station would help. Tony Peralta advised that the project is still in its early stages, and a design has yet to be considered. However, he further added that when a drainage system can operate using gravity, it tends to be more reliable and less expensive than a pumped system. Not to mention, pumped systems have considerably more maintenance and operating costs that typically are shared with all lands and roads contributing to and/or benefiting from the system.
17. At the conclusion of the discussions, we advised that we would maintain close consultation with relevant environmental stakeholders and directly affected landowners to review and refine the details of the proposed drainage improvements.

On this note, the On-Site Meeting had concluded.

VI. AREA REQUIRING DRAINAGE AND THE VALIDITY OF THE PETITION FOR THE NEW DRAINAGE SYSTEM

As it relates to the request for a new Municipal Drain to facilitate the development of the residential subdivision, a formal Petition has been submitted by the owner of the lands identified as Colchester Bay Inc. (670-03703). Based on this submission, the Petition has been reviewed for compliance with the provisions of the Drainage Act.

In accordance with Section 4 of the Drainage Act, we performed a review of the "Area Requiring Drainage" for this Petition. Based on the information provided, the discussions at the On-Site Meeting, and our review of the additional information gathered, we were able to confirm the "Area Requiring Drainage". At the time when the Petition was submitted, the Consent Application for severances had yet to be officially approved by the Municipality. Therefore, the Petition was submitted on behalf of the Corporation owning Parcel 670-03703. The majority of the parcel forms part of the Langlois-Arner Drainage System watershed as it currently exists. However, upon the approval of the severances, the overall property will require a sufficient outlet to facilitate the development. Therefore, we find that only the subject property shall be defined as the "Area Requiring Drainage".

In accordance with Sections 4 and 9 of the Drainage Act, the validity of the Petition shall be determined by the Engineer, as it relates to the "Area Requiring Drainage". Moreover, Section 9(2)(c) obligates the Engineer to establish the requirements for a Petition to comply with Section 4. Accordingly, we herewith provide the following comments as they relate to the validity of the submitted Petition and the requirements for its compliance:

- **Section 4(1)(a)** requires that *"the majority in number of the owners, as shown by the last revised assessment roll of lands in the area, including the owners of any roads in the area;"*

Based on the "Area Requiring Drainage", as described above, we find that only one (1) property is within the area requiring drainage and the Owners of said property have signed the Petition. **Therefore, the Petition satisfies the requirements under Section 4(1)(a).**

- **Section 4(1)(b)** requires that *"the owner or owners, as shown by the last revised assessment roll, of lands in the area representing at least 60 percent of the hectareage in the area;"*

Based on the "Area Requiring Drainage", as described above, we find that **100** percent of the hectareage within this area has signed the Petition. **Therefore, the Petition satisfies the requirements under Section 4(1)(b).**

Therefore, in accordance with the provisions of the Drainage Act, we find that the current Petition is considered a valid Petition pursuant to Section 4(1)(a) and/or (b) of the Drainage Act, RSO 1990, Chapter D.17, as amended in 2021. Based on the sufficiency of the Drainage Petition and our understanding of the general scope of work for this project, we continued with our investigations and field survey for the project.

VII. REGULATORY REQUIREMENTS THROUGH ENVIRONMENTAL AGENCIES

Based on the information gathered at the On-Site Meeting and further discussion with affected landowners, no further formal requests for improvements to the Langlois-Arner Drainage System were submitted by other landowners within the drainage system. Therefore, we established that the scope of work for this project shall focus on the requirements necessary to satisfy the Developer's needs for the residential development. Through the development process, Dillon engaged in various correspondence with the Town of Essex and the County of Essex related to the Planning and Engineering processes to satisfy the requirements of development. As a regulatory requirement, through the provisions of the Drainage Act, applicable Federal and Provincial legislation and policy must be considered when completing drainage works.

The Drainage Act specifically identifies the rights of the Conservation Authority, through the Conservation Authorities Act, for all Municipal Drains within their jurisdiction. As previously noted, the Town of Essex had submitted a notice to the Essex Region Conservation Authority (ERCA) as required through Section 78(2) of the Drainage Act, for their comments and concerns related to the requested works. Prior to the scheduled On-Site Meeting, we received the initial comments from the ERCA. The ERCA had confirmed that the Langlois-Arner Drainage System is located within the regulated limits through Section 28 of the Conservation Authorities Act and is subject to the necessary permitting for the proposed works. These comments identified that the ERCA will require the necessary analysis and design to demonstrate no negative impacts to the drainage scheme and confirmed that any proposed design shall accommodate the 1:100-year storm event.

The initial comments provided by the ERCA also confirmed the need to obtain approvals and/or authorizations from the appropriate governing agencies associated with the Fisheries Act and the Endangered Species Act as part of our regulatory obligations through provisions of the Drainage Act.

With respect to the Department of Fisheries and Oceans (DFO) concerns and comments, we have performed a project-based self-assessment for the subject drainage works according to the guidelines and requirements established by the DFO and as listed on their website. Based on our review, we felt that this project would require the submission of a "Request for Review" application to DFO, to ensure that the works proposed under this project will not cause serious harm to fish and their habitat. A "Request for Review" application was submitted on March 29, 2023, for this project. Through this process, further discussions and correspondence transpired with DFO staff towards the approval of the proposed works.

The Ministry of the Environment, Conservation and Parks (MECP) currently regulates the Endangered Species Act, 2007. New regulation provisions under Ontario Regulation 242/08, Section 23.9 allow the Municipality to conduct repairs, maintenance, and improvements, within existing Municipal Drains, under the Drainage Act and these works are exempt from Sections 9 and 10 of the Endangered Species Act, so long as the rules in the regulation are followed. If eligible, the regulatory provision allows Municipalities to give notice to the Ministry by registering their drainage activities through an online registry system. Seeing that the new subdivision drain is proceeding through a petition request, this project would not qualify for the exemption under Section 23.9. Therefore, a formal submission to the MECP is required to obtain guidance for this project, relative to the Endangered Species Act.

To establish the watershed area, we investigated and reviewed all of the past Engineer's Reports on the Langlois-Arner Drainage System. We also carried out cross-checks of the watershed limits utilizing the most recent reports of the various drains in the vicinity of the Langlois-Arner Drainage System. In addition, we utilized current LiDAR information to cross-check the watershed limits at various locations throughout the watershed. All of the above investigations not only provided us with the correct watershed area but also provided us with accurate information to assist us with the preparation of our Construction Schedule of Assessment and Future Maintenance Schedules of Assessment for this project.

VIII. STAKEHOLDER CONSULTATION

Throughout this project and in addition to the details outlined within the On-Site Meeting, we engaged in various consultations and correspondence with the Developer (and their representatives), the Town of Essex, the County of Essex, the ERCA, and landowners directly impacted by the proposed drainage improvements.

The consultation with governmental agencies (Town, County and the ERCA) was primarily related to the proposed development's drainage requirements to satisfy the Planning and Engineering approval process.

In addition to the governmental agencies, we had also consulted with adjacent landowners directly impacted by the proposed drainage improvements, primarily those at or adjacent to the outlet of the Langlois-Arner Drainage System. With direct impacts related to these drainage improvements, we consulted with the following landowners:

671 & 673 Ambassador Beach Road:

Ron Pniewski represents the lands currently owned by Kathy Pniewski Trustee, identified as Parcel 670-05300 and Parcel 670-06900, otherwise known as 671 and 673 Ambassador Beach Road, respectively. The subject lakefront properties are significantly impacted by the proposed works, as the existing enclosed outlet portion of the Langlois-Arner Drainage System resides within these lands. The existing outlet pipe traverses diagonally across the center portion of 671 Ambassador Beach Road, where the outlet portion of the enclosure terminates within the lands of 673 Ambassador Beach Road. At the onset of this project, both properties were occupied by existing dwellings with accessory buildings. The existing dwelling on 671 Ambassador Beach Road was in close proximity to the enclosed outlet pipe, significantly impacting its replacement. Through consultation with Ron Pniewski, the original drainage design concept would replace the outlet pipe in the general alignment of the existing outlet pipe, with some slight modifications. In August 2023, the region was hit by a significant storm event, damaging the existing dwelling on 671 Ambassador Beach Road beyond repair, leading to its subsequent removal from the property. Upon reviewing the proposed design details, Ron Pniewski became aware that the regulatory planning and setback requirements for rebuilding the dwelling would significantly reduce its allowable size, potentially rendering the property unusable. Through various discussions, it was determined that a lot line adjustment could be considered between the two properties owned by the Pniewski's to form more favorable lot dimensions that can accommodate a new drainage outlet along the east limit of 671 Ambassador Beach Road. After consultation with the Town of Essex Planning Department and the ERCA, this concept was deemed acceptable to both governing bodies, prompting Ron Pniewski to initiate a planning process to adjust the lot configuration to better facilitate the drainage outlet and the associated property.

665, 667, & 673 Ambassador Beach Road:

With the proposed realignment to the Langlois-Arner Drainage System outlet pipe along the east limit of 671 Ambassador Beach Road, there could be impacts to the neighbouring lands to the east. These lands include 665 Ambassador Beach Road (Parcel 670-05200), 667 Ambassador Beach Road (Parcel 670-05100), and 673 Ambassador Beach Road (Parcel 670-05000). Therefore, these landowners were contacted to discuss and review the proposed drainage improvements and their potential impacts to their lands. Through consultation, the adjacent landowners appeared to be content with the proposed drainage improvements.

Paul Marontate (102 Ambassador Beach Road):

Paul Marontate represents the lands currently owned by Paul & Sherri Marontate and Susanne Poirier, identified as Parcel 670-03701, otherwise known as 102 Ambassador Beach Road. The subject property includes a private residential mobile home park community, including the private road identified as

Ambassador Beach Road. The subject property previously included the development parcel, which has since been subdivided. The existing open portion of the Langlois-Arner Drainage System traverses along the northern limit of the subject property, where modifications to the open drain were conducted in the 2011 Engineer's Report. Based on the proposed drainage improvements, the existing berm which resides along the south side of the Langlois-Arner Drainage System is to be modified, improved, and extended along the open channel. Through consultation with Paul Marontate, he appeared content with the proposed drainage improvements.

In addition to the details outlined above, Dillon further summarized the landowner consultation as part of the "Technical Memo" outlined within **Appendix "A"**.

IX. DESIGN CONSIDERATIONS

As outlined previously, it has been established through consultation that Dillon shall be responsible for all analysis and design associated with the proposed development, along with the necessary drainage improvements to be incorporated as part of this report. All analysis and design were reviewed by the Town and ERCA relative to their requirements, and the works were completed based on the following criteria.

"A Guide for Engineers Working Under the Drainage Act in Ontario" - OMAFA Publication 852 (2018), is the current reference documentation used by Engineers carrying out work on Municipal Drains through provisions of the Drainage Act. Based on this document, the 2-year return period storm design (50% chance of occurring each year) is the recommended design standard for the minor flow path applied to Municipal Drains within rural Ontario, specific to open drain channels and low-hazard agricultural access crossings. The exception is for residential, industrial, and commercial properties where flooding could create significant damage to the surrounding properties, a higher 5-year (20% chance of occurring each year) to 10-year (10% chance of occurring each year) return period storm design could be utilized. As identified within this guide, the Municipality and Conservation Authority may have specific design standards that should be considered. Based on our consultation and review of this project, it has been identified that the ERCA regulates the major flow path to a 1:100 return period event (1% chance of occurring each year). Therefore, this return period shall be considered as part of the analysis and design considerations.

The Town of Essex has created a Development Manual with the intent to streamline the process for "new" development works within their jurisdiction. This Development Manual is intended to work in conjunction with the requirements of Ontario Provincial Standard Specifications and Standard Drawings. This manual specifies that storm sewers in the Town shall be designed for a minimum 5-year return period (20% chance of occurring each year) based on the Rational Design Method. Furthermore, the Windsor/Essex Region Stormwater Management Standards Manual (WERSMSM) outlines the general requirements for works proposed for "new" development within the Windsor/Essex Region. According to the guidelines established within this document, the standard for a new municipal storm sewer (minor) system design is a 5-year return period (20% chance of occurring each year). As part of new development, the major drainage system (or floodproofing measures) shall consider a minimum design of a 100-year return period (1% chance of occurring each year) that also accounts for surface ponding and floodproofing elevations.

Based on the details outlined above, we find that the analysis and design associated with the proposed drainage improvements have considered the Provincial, Municipal and Regional design requirements to establish an

appropriate design criterion for the new drainage system intended to only provide a means of a drainage outlet for the proposed lot severances and future development. As a result, Dillon conducted the required analysis based on the requirements outlined above and submitted a Technical Memo titled "**Langlois-Arner Drain Improvements – Hydraulic Analysis (Revision 3)**", dated April 5, 2024. Subsequent to the general acceptance of this document, a Technical Memo for the detailed design of the overall drainage system improvements was submitted titled "**Langlois-Arner Drain & Colchester Heights Drainage Scheme – Technical Design Memo**", dated May 23, 2025. Both documents were reviewed and generally approved by the Town of Essex and ERCA. Copies are included in **Appendix 'A'** of this report.

X. FINDINGS AND RECOMMENDATIONS

Based on detailed investigations, consultations with affected landowners, municipal staff, and environmental agencies, as well as information gathered during the On-Site Meeting and other directives issued for this project, we have established the general requirements to adequately address the necessary improvements to the Langlois-Arner Drainage System and to facilitate the creation of the Colchester Heights Drainage Scheme. Our findings and recommendations are outlined in the following paragraphs.

ERCA, DFO and MNR/MECP Considerations

During the course of our investigations, this drainage project was discussed and reviewed in detail with James Bryant and Tian Martin of the ERCA to address the regulatory requirements, concerns, and comments related to this Municipal Drain. The Langlois-Arner Drainage System is located within the regulated area and is under the jurisdiction of the ERCA. Therefore, an ERCA Permit is required for the improvements to the Langlois-Arner Drainage System and the implementation of the Colchester Heights Drainage Scheme. Further to the various meetings and upon their request, a detailed hydraulic analysis and a design proposal were submitted to the ERCA for their review and consideration. Based on the submissions, the ERCA provided us with their comments and concerns through email correspondence. A copy of the ERCA response is included in **Appendix "B"**.

With respect to the DFO, the proposed drainage works were "Self-Assessed" by the Engineer, through the DFO website and supporting documentation to determine whether this project shall be reviewed by the DFO. Through our research and with the proposed drainage system not having any status or drain classification with the DFO, a "Request for Review" was submitted to the DFO for their evaluation. As a result, DFO provided a "Letter of Advice" that confirms that the proposed works under this project will likely not result in impacts on fish and fish habitat, so long as standard measures for fish habitat and migration are implemented. A copy of the DFO Letter of Advice is included in **Appendix "B"**.

The Ministry of Natural Resources (MNR) has transitioned the responsibilities of the Species at Risk Provincial Legislation to the Ministry of the Environment, Conservation and Parks (MECP). Section 23.9 of the Endangered Species Act, 2007 allows the Municipality to conduct the eligible repair, maintenance, and improvement work for existing Municipal Drains, which exempts these activities from Sections 9 and 10 of this Act, so long as they follow the rules within Ontario Regulation 242/08. With the Colchester Heights Drainage Scheme proceeding under Section 4 of the Drainage Act, this portion of the project would not qualify for exemptions under Section 23.9 of the Endangered Species Act, 2007. Therefore, following the "Guidelines for Activities Under the Drainage Act" presentation to the Drainage Superintendents of Ontario (DSAO)

Member Chapters, dated June 21st – 24th, 2021, our office provided the MECP with an Endangered Species and Critical Habitat Review submission for their evaluation and comments. This document outlines the potential impacts on affected species and their habitat, together with measures for avoidance and minimizing adverse effects. Based on the comments from the MECP, they have identified that the authorization is a proponent-led process to determine whether SAR and their habitat are present on or around the site. Based on our investigations, we found that there were no SAR species (and their habitat) present within the project site. Therefore, we find that the proposed works should not contravene the ESA. A copy of our submission is included in **Appendix "B"**.

Through correspondence with the ERCA, the DFO, and our submission through the Endangered Species Act, we have provided for all of the ERCA, DFO, and MECP concerns and comments in our design and recommend that these drainage works be constructed in total compliance with all of the above.

Proposed Drainage System and Improvements

As part of the development of the site, Dillon Consulting Ltd. (Dillon) was retained by the developer to conduct all of the necessary analysis, design, and planning towards obtaining all approvals. With the requirement to incorporate the development drainage system as a Municipal Drain, N.J. Peralta Engineering Ltd. (Peralta) was appointed through the Municipal Council to prepare an Engineer's Report for the necessary improvement required to facilitate the development of the residential subdivision. With Dillon's direct involvement in the extensive design and analysis to support the development, it would be most advantageous to have Dillon continue with the hydraulic analysis and design to satisfy the drainage requirements for the development and the Langlois-Arner Drainage System improvements. These findings and recommendations would form part of the required Engineer's Report prepared by Peralta, through the provisions of the Drainage Act.

As previously noted, Dillon had prepared and submitted Technical Memos to support the hydraulic analysis and design recommendations for the creation and necessary improvements to the existing and proposed drainage system. All of these are being implemented to facilitate the proposed residential subdivision development. These Technical Memos form part of this report and are included in **Appendix "A"**.

From our investigations, examinations, calculations, discussions, and determinations with the affected parties, the following findings were noted, and recommendations regarding the creation of the required Colchester Heights Drainage Scheme are provided as follows:

New Municipal Drain to Facilitate the Development

1. Parcel 670-03703, currently owned by Colchester Bay Inc., is currently designated as an agricultural parcel of land that is in the process of being converted to a Residential Subdivision through the Planning Act. In order to satisfy the requirements of development, the new residential subdivision shall require a legal drainage outlet. A Draft Plan of Subdivision has been created to demonstrate the intended lot layout of the proposed fifty-two (52) lots, parkland, and Municipal right-of-way. The latest Draft Plan of Subdivision has been prepared by Dillon, dated July 17, 2024, having Reference Number 21-3105. The proposed subdivision has been identified on the Draft Plan of Survey, including Parts 1 through 55 and further referred to within this report and accompanying drawings. A copy of the latest Draft Plan of Subdivision is included within this report and is identified as **Appendix "A"**.

2. Based on the drainage history and site topography, the original undeveloped property is primarily part of the Langlois-Arner Drainage System watershed. It is located on the south side of County Road 50 and lies adjacent to, and has a direct connection with, the open drain portion of the Langlois-Arner Drainage System. Given these factors, the Langlois-Arner Drainage System represents the natural drainage outlet for the development of these lands. Although the drain is accessible from the property, it has been determined that improvements to the Municipal Drain are necessary to establish it as a sufficient outlet for the development. These improvements are further described in the preceding section on Langlois-Arner Drainage System Improvements.
3. To best facilitate the development of the overall subdivision, the proposed drainage system within the subdivision shall be located within the road right-of-way. The new drainage system shall be constructed to accommodate the increased runoff from the proposed road and the adjacent lands contributing to the system. The overall development encompasses a singular looped street (Street 'A') with two entrances from County Road 50. The roadway for Street 'A' is intended to encompass an urban cross-section that includes curbs and gutters. All of the lots created as part of the development form part of the overall watershed and include a direct connection to the drainage system by means of a service connection. The proposed drainage system has been established having a main drain and a branch. These components are identified as follows:
 - a. Colchester Heights Drain (Main Drain) – The covered drainage system extends within the right-of-way limit, and within the roadway limits of the west leg of Street 'A', extending from its top end at proposed MH-1 at Station 1+057.0. The main drain continues downstream along the west leg of Street 'A' to MH-8 at Station 1+300.6 / 2+140.0. From this point, the main drain extends as a covered drain across Lots 17 and Lot 18 and terminates into the Langlois-Arner Drainage System at Station 2+086.0. The outlet portion of the drain extends from Station 2+086.0, as a rock-lined open channel, to the original alignment of the Langlois-Arner Drainage System at approximately Station 2+093.0.
 - b. Branch Drain - The covered drainage system extends within the right-of-way limit, and within the roadway limits of the east leg of Street 'A', extending from its top end at proposed MH-5 at Station 1+500.9. The branch drain continues downstream along the east leg of Street 'A' and terminates at MH-8 at Station 1+300.6.
4. In order to appropriately and safely convey surface runoff from within the site, during storm events in excess of the covered drainage system, a conveyance route has been established as part of the overall system. This conveyance route is located within the proposed roadway, which has been graded towards the outlet portion of the drainage system. At the location of the outlet portion of the proposed drainage system, the overland conveyance route extends within private property, between Lot 17 and Lot 18. With the need to establish and protect the outlet portion of the conveyance route, we recommend that the conveyance channel be established through the private lands from the right-of-way limit at approximately Station 2+134.0 to the south limit of the subject properties to Station 2+086.0. This conveyance route includes the proposed curb cut at approximately Station 2+225.0, the ditch inlet catchbasin at Station 2+130.0 and the conveyance swale cross-section illustrated on Sheet 5 of the accompanying drawings.

5. With the development proceeding with an urban cross-section, the frontage of the individual lots shall be graded toward the roadway and the rear of all individual lots is intended to be collected by rear yard drains connected to the provided service connection. As a result, all surface and subsurface stormwater runoff originating from the entire site shall be collected and discharged directly to the new Municipal Drain, with the exception of the lands forming part of the Langlois-Arner Drain channel widening. The individual service connection for Lots 1 through 52 shall be provided as each lot's primary connection to the Municipal Drain. As such, each service connection from the right-of-way limit to the storm sewer shall form part of the Municipal Drain.
6. We recommend that the new drainage system, together with all ancillary work required to complete the proper functionality of the proposed drainage system as described above, be conducted and performed as part of this project. We further recommend that all related appurtenances be constructed as part of this drainage project and be completed to the satisfaction of the Town's Drainage Superintendent and the Consulting Engineer.
7. As part of the creation of the new Municipal Drain, we recommend that new working corridors (or drainage easements) be established herein for access and maintenance of the new Municipal Drain. Specific access routes have further been established within this Report and Specifications to minimize construction disruption throughout the length of the drain. All working corridors shall be a free, unencumbered and uninterrupted easement in perpetuity on, in, over, under, across, alongside and through the lands described herein, for the purpose of installing, maintaining, replacing, altering, cleaning, repairing, providing and operating the drainage system. We further recommend that this area shall remain free and clear of any new buildings, structures, fences, concrete or asphalt paving, or other structures or obstructions of any kind. In the event any such item is placed on any of the lands referred to herein, the Owner or Owners of the said lands at the time shall be liable for the cost incurred by the transferee, its servants, agents and assigns, in any damage sustained and/or the removal of such items.
8. As previously outlined, the new Municipal Drain created as part of this report encompasses a Main Drain and a Branch Drain to facilitate the development of the subject property. Following the adoption and implementation of this new drainage system, we recommend that this new Municipal Drain, together with all associated features, henceforth be known as the "**COLCHESTER HEIGHTS DRAINAGE SCHEME**". More specifically, the **Main Drain** shall be further referenced as the "Colchester Heights Drain", and the **Branch Drain** shall be further referenced as the "Colchester Heights Drain - Branch".
9. The governing by-laws for both the Bellcreef Beach Drainage and Pumping Scheme and the Bellcreef Beach Diversion Drain include schedules of assessment to allocate costs for the initial construction and ongoing maintenance of these systems. These assessments are based on land use and drainage patterns at the time the by-laws were enacted. Since development has occurred on the subject property, and a portion of the subject property's drainage is now being diverted to the Langlois-Arner Drain, the current affected area and land use are no longer accurately represented in the existing schedules. As a result, it is necessary to update the parcel's assessment to ensure a fair distribution of future maintenance costs. Given these changes to the original parcel outlined in the governing by-laws, we recommend the preparation of a Section 65 Report to identify and formalize

the necessary assessment updates for both the Bellcreeft Beach Drainage and Pumping Scheme and the Bellcreeft Beach Diversion Drain.

In summary, we recommend that the proposed Colchester Heights Drainage Scheme be constructed at the locations and alignments detailed in the accompanying drawings, and per this report and the attached specifications. Furthermore, all works associated with this project shall be carried out in accordance with Section 4(1)(a) and/or (b), pursuant to the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021".

Langlois-Arner Drainage System Improvements

10. As previously noted, the proposed development site resides south of County Road 50. The site is also bounded by the residential lands along Santa Ana Avenue to the west, Ambassador Beach Road (Private) to the east and south, and along the northwest bank of the open drain portion of the Langlois-Arner Drainage System. The property does not have direct access to Lake Erie. Therefore, the Langlois-Arner Drainage System serves as its direct and primary drainage outlet for the development. Adjacent to the subject property, the Langlois-Arner Drainage System has an open drain configuration. However, as it crosses the south leg of Ambassador Beach Road (Private), the Municipal Drain converts to a pipe enclosure across private residential lands to its outlet into Lake Erie. At the outlet of the Municipal Drain, a V-shaped baffle wall system was installed to protect the existing outlet pipe from damage caused by ice and debris, together helping prevent sand accumulation in the outlet pipe.
11. The southern portion of the development site currently provides existing stormwater runoff storage for the Langlois-Arner Drainage System. Further to the natural storage within the drain, this portion of the open drain was further expanded through the 2011 Engineer's Report, to help alleviate flooding concerns. As a result, the existing low-lying lands and the open drain within the subject property currently provides stormwater management storage and flow attenuation for the overall drainage system. Based on the current configuration of the open portion of this Municipal Drain, the full development of the subject property is limited without creating any adverse effects on the overall drainage system.
12. Further to Dillon's Technical Memo for the Hydraulic Analysis prepared for this project, they analyzed the functionality of the existing system and further outlined the necessary improvements to facilitate the proposed development, relative to the required design standards. All of these were determined towards establishing a subdivision stormwater management (SWM) strategy to best facilitate the development. With its close proximity to Lake Erie, the SWM strategy focused on having an uncontrolled discharge into the Langlois-Arner Drainage System while maintaining a 100-year level of service. Based on the findings outlined within the technical memo, the following improvements to the existing Langlois-Arner Drainage System were recommended:
 - a. Increase the amount of stormwater storage within the existing open portion of the drain, upstream of the outlet enclosure.
 - b. Increasing the outlet enclosure pipe size to better convey runoff to the Lake.

- c. Add additional protection to the adjacent lands by extending the existing earthen berm along the southeast side of the existing Langlois-Arner Drainage System alignment.
13. In order to increase the stormwater storage within the Langlois-Arner Drainage System, Dillon recommends that the downstream portion of the open drain, from Station 0+079.4 to Station 0+275.0, be widened and expanded to provide additional inline storage and attenuate peak water levels in the system. The improved open channel is intended to provide sufficient conveyance of drainage flows from the upstream watershed while maintaining and improving the necessary runoff storage volume of the predevelopment and post-development runoff. The new conveyance channel has been sized to convey and store flows from storm events up to the 1:100-year storm event. The alignment shall be constructed so that it maintains a top width ranging between 12.0 metres to 41.3 metres, having drain side slopes no steeper than three (3) horizontal to one (1) vertical. The high-flow shelf/terrace width of the open channel shall be between 2.00 metres to 25.8 metres, graded at a minimum 2.0 percent. The low-flow channel shall be constructed with a 6.00-metre bottom meeting the design grade of the Municipal Drain while maintaining a minimum of two (2) horizontal to one (1) vertical side slopes, as shown and detailed within the plans.
14. Through consultation with the ERCA, the subject property is located within the 1:100-year floodplain area associated with Lake Erie. To ensure that no adverse effects are created by the development of the subject lands and the improvements to the Langlois-Arner Drainage System, Dillon verified potential water surface elevation impacts to the adjacent lands. Through this analysis, it was confirmed that the existing berm along the southeast side of the Langlois-Arner Drainage System required enhancements to provide protection and safeguards against the extreme situation during a 1:100-year storm, together with impacts from the lake. As such, it is recommended that the existing berm maintain a minimum floodproofing elevation of 175.900 metres. This flood protection berm is intended to work in conjunction with the inline storage requirements to protect the residential lands to the south of the development site. The proposed berm along the south side of the Langlois-Arner Drainage System shall be continuous and constructed having a 3.00-metre top width, with a minimum of 2.0 horizontal to 1.0 vertical side slopes. This flood protection dyke shall extend from the existing berm at the south end of the development site, which currently forms part of the Bellcreef Beach Diversion Drain, and extend easterly along Ambassador Beach Road (South) and wrap around the north end of the outlet enclosure, at approximately Station 0+079.4. The berm shall tie into the existing berm along the southeast side of the Langlois-Arner Drainage System and extend easterly to the Ambassador Beach Road at the east end of the development site, terminating at approximately Station 0+275.0. The overall berm shall be accompanied by a series of catch basins located in the low-lying areas on the back side (southeast) of the berm. These catchbasins shall discharge safely to the Langlois-Arner Drainage System and be fitted with backwater control gates.

The portion of the existing berm that currently forms part of the Bellcreef Beach Drain Diversion was installed for the protection of the adjacent residential lands to the south. However, with the enhancement and extension of this berm now forming part of the Langlois-Arner Drainage System, we recommend that the original portion of the berm (berm only) be abandoned as part of the Bellcreef Beach Diversion Drain and subsequently form part of the Langlois-Arner Drainage System. The abandonment of the Bellcreef Beach Diversion Drain berm is in accordance with Section 19 of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021".

15. Through the analysis of the existing drainage system, it was determined that the existing 900mm diameter outlet enclosure pipe, across Ambassador Beach Road and through the private lands of Kathy Pniewski Trustee (670-05300 & 670-06900), requires upsizing to safely convey the increase of stormwater runoff to the lake. As a result of the hydraulic analysis, the new outlet enclosure pipe shall consist of a 1500mm diameter concrete pipe. With the intended changes to the parcel configuration of the Pniewski lands, it was deemed advantageous to have the replacement outlet enclosure pipe set in a new location to minimize impacts to the remaining structures and the future redevelopment of the property. As a result, the new alignment of the outlet pipe shall be situated along the east limit of Parcel 670-05300, while having a minimum setback distance of 6.0 metres from the adjacent neighbouring buildings, where the centreline of the proposed outlet pipe shall be set 5.07 metres from the east limit of Parcel 670-05300. As a result, the re-aligned outlet enclosure pipe shall consist of approximately 73.2 metres of 1500mm diameter concrete pipe extending from Station 0+006.2 to Station 0+079.4 as illustrated within the accompanying drawings. These works include a prefabricated tee catchbasin and trash grates, together with a new interlocking concrete headwall at the upstream end and armour stone shoreline protection at the outlet end. The replacement of the existing outlet enclosure pipe shall require the removal of the existing pipe, headwall, and outlet baffle system. With the replacement and realignment of the existing outlet enclosure pipe and appurtenances, we recommend that they be removed and abandoned in accordance with Section 19 of the Drainage Act, RSO 1990, Chapter D.17, as amended in 2021.
16. In association with the proposed outlet enclosure and the future reconstruction of the house within the lands currently owned by Kathy Pniewski Trustee (670-05300), we recommend that a berm be installed along the east limit of the property. This berm shall be installed to serve as protection from surcharging and surface runoff directed towards the neighbouring lands to the east as a result of the redeveloped house required to be set to the minimum flood protection elevation of 175.700m was established by the ERCA. This berm shall be accompanied by a rear yard catchbasin with a backwater protection feature to collect and safely discharge surface runoff directed by the proposed berm.
17. To facilitate the new alignment of the outlet enclosure pipe, the existing garage within the lands owned by the Kathy Pniewski Trustee (670-05300 & 670-06900) shall be removed and relocated to a new location established by the Owner and abide by Municipal setbacks and subject to the necessary approvals and permitting. The cost of which shall form part of the overall project costs. Furthermore, an existing shed is currently attached to the garage and cannot be safely relocated. As such, an allowance shall be provided for the value of a new shed to be replaced.
18. As part of the outlet enclosure replacement, we recommend that all existing catchbasins along Ambassador Beach Road be directed to the open drain portion of the Langlois-Aner Drain while being accompanied by heavy-duty flap gates. All of which have been illustrated and detailed within the accompanying drawings.
19. Access routes and working corridors have previously been established within the governing Langlois-Arner Drainage System reports. However, with the works being proposed under this report specific to a particular area and modified to suit current conditions, we recommend establishing a new access route and working corridors for the initial construction and future

maintenance of these specified works. Updated working corridors for future maintenance have been re-established herein. All working corridors for the Langlois-Arner Drainage System shall be a free unencumbered and uninterrupted easement in perpetuity on, in, over, under, across, alongside and through the lands described herein, for the purpose of installing, maintaining, replacing, altering, cleaning, repairing, providing, and operating the open channel and existing enclosure. We further recommend that this area shall remain free and clear of any new buildings, structures, fences, concrete or asphalt paving, or other structures or obstructions of any kind. If any such item is placed on any of the lands referred to herein, the Owner or Owners of the said lands at the time shall be liable for the cost incurred by the transferee, its servants, agents, and assigns, in the removal of such items.

20. We further recommend that all ancillary work required to complete the proper functionality of the proposed works also be conducted and performed as part of this project and that all of the work associated with this project be provided to the full satisfaction of both the Municipality's Drainage Superintendent and the Consulting Engineer.
21. The proposed works as part of the overall project are intended to incorporate the proposed development and alter the overall watershed of the Langlois-Arner Drainage System. As such, it is necessary to prepare an updated Maintenance Schedules of Assessment for the entire system, to properly allocate future maintenance costs to all lands and roads that will continue to contribute to the Langlois-Arner Drainage System.

In summary, we would recommend that the proposed Colchester Heights Drainage Scheme be implemented and constructed to serve as the primary drainage outlet for the proposed residential subdivision. In association with the development, we further recommend that the existing outlet portion of the Langlois-Arner Drainage System be re-aligned to the new location and improved to establish a sufficient outlet for the entire drainage system. We further recommend that all works be completed per this Report, the attached Specifications, and the accompanying Drawings and that all of the works associated with same be carried out in accordance with Sections 4, 19, and 78 of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021".

XI. ALLOWANCES AND COMPENSATION

Langlois-Arner Drainage System Improvements

As part of the improvements to the Langlois-Arner Drainage System, several properties are directly affected by the proposed works. Accordingly, those properties may be entitled to allowances and/or compensation in accordance with Sections 29 to 31 of the Drainage Act.

Land Appraisal

Based on the general scope and direction of this project, we recognized that the nature of the lands affected by the proposed works will require allowances and compensation. To ensure that we are fair and reasonable with the allowances issued to these lands along the drain, we determined that it would be prudent to have the waterfront residential lands within this watershed evaluated and appraised to establish a fair market value for their compensation for land taken. Through consultation with Town Staff, we retained Fierland

Realty Ltd. (Fuerland), located in the City of Windsor, to complete this evaluation. On July 29, 2024, Fuerland provided us with their Market Value of Partial Takings Reports for residential lands affected by this project. Based on the findings of the report, the current **market value of partial takings of waterfront residential lands is \$293.32 per square metre (\$27.25 per square foot) of land**. A copy of the land value appraisal is included in this report and within **Appendix "C"**. As a result, these values were utilized in establishing the allowances and compensation to all affected properties.

Allowances for Land Taken

Section 29 of the Drainage Act provides for an allowance to specific landowners for the right-of-way required for the construction and maintenance of a Municipal Drain. Allowances provided under this section of the Act are generally allocated only once and at the time when the land is taken for the required purpose. This allowance is typically provided for lands that are permanently and/or periodically taken out of production/use as a result of the drainage works.

Working Corridors – In order to conduct improvements and/or maintenance along the course of a Municipal Drain, working corridors (or drainage easements) are established as a defined right-of-way for these drainage works. Providing a one-time allowance for the use of these lands establishes the legal right to utilize the lands for the purpose of the initial construction and periodic future maintenance of the Municipal Drain.

Where the Langlois-Arner Drainage System has previously been established as a Municipal Drain, the affected lands along the course of the open drain and outlet enclosure have already been established and compensated for the land taken under previous Engineer's Reports and By-Laws.

Open Drain Portion - The working corridor for the open portion of the Langlois-Arner Drainage System, located adjacent to and within the development site, was previously established through the 1940 and 2011 reports and extends along both sides of the open channel. However, no specific width for the corridor was formally defined. Based on the theoretical requirements for constructing the existing parameters of the open channel, it is assumed that a minimum corridor width of 6.10 metres (20.0 ft.) was established at the time to accommodate the necessary drainage works.

As it relates to the expansion of the flood protection berm extending onto the adjacent lands to the southeast, the implementation of the berm shall remain within the previously established working corridor of 6.10 metres (20.0 ft.). Therefore, it is not anticipated that any further lands will be required to construct or maintain the flood protection berm and only a nominal value of \$1.00 shall be paid to the lands currently owned by Gerald & Sherri Marontate and Susanne Poirier (670-3701) to re-establish the legal right of the lands required to complete the work.

Based on the proposed works to expand the open channel to the northwest (within the development property) and establish a new working corridor for future maintenance, the cost of implementing these improvements will be borne by the development property. Therefore, a nominal value of \$1.00 shall be paid to Colchester Bay Inc. (670-03703) to formally re-establish the legal right to access the affected lands necessary for construction and future maintenance, including the redefined working corridors.

Outlet Enclosure Portion - Through our research of past reports and By-Laws, the working corridor for the outlet enclosure pipe of the Langlois-Arner Drainage System was not clearly defined within the previous By-Laws. However, based on the nature and size of the existing outlet pipe, together with the theoretical requirements to install the existing outlet enclosure, it is assumed that the working corridor would require a minimum of a 4.57-metre (15.0 ft.) width centred over the entire length of the existing 900mm diameter outlet pipe.

To accommodate the increase in culvert size from 900mm to 1500mm as part of the improvements to the Langlois-Arner Drainage System, the new outlet pipe will require a minimum 6.10-metre (20.0 ft.) working corridor. This increase includes an additional 1.53 metres (5.0 ft.) in corridor width over the proposed pipe length. As the project developed, a revised alignment for the outlet enclosure pipe was established. This new alignment includes the construction of a berm along the east property limit, which will form part of the Municipal Drain. The area occupied by this berm results in a further increase of 2.07 metres (6.56 ft.) in working corridor width through lands currently owned by Kathy Pniewski Trustee (Parcel 670-05300).

Based on the above, we have provided for the necessary compensation for land taken in our estimate, as is provided for under Section 29 of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021". All Section 29 allowances allocated to all affected lands have been summarized in **Table 3**.

Allowances For Damages

Section 30 of the Drainage Act provides for an allowance to specific landowners for damages caused by the construction and future maintenance of a Municipal Drain. Allowances provided under this section of the Act are generally allocated to properties that endure damages caused by the proposed works (such as trees, lawns, fences, lands, and crops etc.). Furthermore, areas or features disturbed by the drainage works that can be fully restored to pre-construction condition (such as lawns, access routes, fences, etc.) are typically specified for full restoration and are not compensated.

The existing alignment of the outlet enclosure pipe for the Langlois-Arner Drainage System currently traverses the private lands of Kathy Pniewski, Trustee (Parcel 670-05300). As part of the system improvements, a new alignment has been established to better accommodate the affected properties. This new alignment will require the relocation of an existing garage and shed. While the garage is expected to be relocated, the shed is not considered salvageable. Therefore, the cost of replacing the shed will be compensated to the property owner. Furthermore, a tree located along the waterfront of the property lies within the path of the new alignment and will require removal. Compensation for the loss of this tree will also be provided to the affected owner.

We have provided for the necessary compensation for damages in our estimate, as is provided for under Section 30 of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021". All Section 30 allowances allocated to all affected lands have been summarized in **Table 3**.

Colchester Heights Drainage Scheme

The new Colchester Heights Drainage Scheme shall be constructed within private lands intended to be developed into a residential subdivision. As such, lands directly affected by these works are subject to allowances and compensation related to this new drainage system.

Allowances For Land Taken

Further to the description outlined for the Langlois-Arner Drainage System, an allowance allocated for Land Taken is compensated only once and at the time when the land is taken for the required purpose. This allowance is typically provided for lands that are permanently and/or periodically taken out of production/use as a result of the drainage works. The lands required to construct and maintain the Colchester Heights Drainage Scheme are situated within the private lands currently owned by Colchester Bay Inc. (670-03703), from which the new residential lots and road network are being severed. With the drainage improvements required to service the subject property, only a nominal value of \$1.00 shall be paid to establish the legal right for the Municipal Drain within these lands. This allowance shall establish the legal right to access the lands for future maintenance. This allowance includes the use of lands within the road allowance, together with the use of Lots 17 and 18, where the outlet portion of the Colchester Heights Drainage Scheme is located.

We have provided for the Land Taken compensation in our estimate, as is provided for under Section 29 of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021". All Section 29 allowances allocated to all affected lands have been summarized in **Table 3**.

Allowances For Damages

All areas disturbed by the proposed works within the subject property are entirely within the affected lands. These lands are located within the setback distances of the developable lands and are currently being used as agricultural lands being converted to a residential subdivision. These lands affected by the initial construction of the new drainage system shall coincide with construction of the new development and once complete, are specified for full restoration. As such, the proposed drainage works will not have any indirect damage to the associated lands. Accordingly, no allowances or compensation for damages will be provided under Section 30 of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021". All Section 30 allowances allocated to all affected lands have been summarized in **Table 3**.

TABLE 3 - SCHEDULE OF ALLOWANCES

Parcel ID	Conc. Or Plan Number	Lot	Owner/s	Roll No.	Land and Right-of-Way (Section 29)	Damages (Section 30)		TOTAL
						Damages to Lands and Crops	Damages for Access	
12	1	Pt. Lot 90	Gerard & Sherri Marontate and Susanne Poirier	670-03701	\$5,366.00	\$0.00	\$275.00	\$5,641.00
13	1	Pt. Lot 90	Colchester Bay Inc.	670-03703	\$1.00	\$0.00	\$0.00	\$1.00
25	Plan 1397	Pt. Lot 16	Kathy Pniewski Trustee	670-05300	\$51,076.00	\$7,700.00	\$0.00	\$58,776.00
TOTALS					\$56,443.00	\$7,700.00	\$275.00	\$64,418.00

XII. ESTIMATE OF COST

Our estimate of the total cost of this work, including all incidental expenses, is the sum of **One Million Three Hundred Ninety Thousand Four Hundred Forty Seven Dollars (\$1,390,947.00)** made up as follows:

CONSTRUCTION ITEMS					
PART A – Langlois-Arner Drainage System					
Item	Description	Est Qty	Unit	Unit Price	Total
OPEN DRAIN WORK					
1.	Brushing of the drain from Station 0+079.4 to Station 0+275.0 including the disposal by burning on-site or removal off-site, including removal of existing trees as required to accommodate the drainage works. Works include removal of mature trees on south side of drain	1.0	Lump Sum	\$ 30,000.00	\$ 30,000.00
2.	Strip topsoil over proposed floodplain bench limits and stockpile from Station 0+079.4 to Station 0+263. Load, haul, and place stockpiled topsoil over excavated area upon completion of excavation (minimum 50 mm thickness) (approximately 3,300 m ²). Any excess materials to remain on site for use by the Owner	1.0	Lump Sum	\$ 13,200.00	\$ 13,200.00
3.	Excavation of drain bottom and floodplain drain bench between Station 0+079.4 to Station 0+263.0, totalling approximately 184 lineal metres of drain and approximately 2,250 m ³ of material. Drain spoils to be stockpiled within the working corridor of the drain for use by the owner. Layout of the drain excavation to be completed by a qualified surveyor	1.0	Lump Sum	\$ 22,500.00	\$ 22,500.00
4.	Supply and install 130 m ² (minimum 300 mm thick) of stone erosion protection (SEP) including new filter fabric underlay on drain banks and bottom, between Station 0+079.4 and Station 0+087.0, as shown on the Drawings.	1.0	Lump Sum	\$ 12,400.00	\$ 12,400.00
5.	Hydraulic seeding of floodplain bench and bank from Station 0+079.4 to Station 0+263.0 (approximately 3,300 m ²)	1.0	Lump Sum	\$ 19,800.00	\$ 19,800.00
6.	Raise and extend existing berm on southeast side of drain from Station 0+079.4 to Station 0+263.0 including stripping of topsoil, placement and compaction clean and dry native clay material, placement of topsoil (minimum 100 mm thickness) and hydraulic seeding.	1.0	Lump Sum	\$ 18,000.00	\$ 18,000.00

Item	Description	Est Qty	Unit	Unit Price	Total
7.	Supply and install one (1) - 600 mm diameter HDPE yard catchbasin complete with heavy duty steel grate and 200 mm diameter DR35 PVC lead with heavy duty steel flap gate. Work includes supply and installation of stone erosion protection (SEP) including new filter fabric underlay on drain bank at pipe outlet (approximately 5 m ²).	1.0	Lump Sum	\$ 1,500.00	\$ 1,500.00
8.	Supply and install two (2) 600 mm × 600 mm concrete ditch inlet catchbasins complete with grate (2:1 slope, as per OPSD 403.01) and 300 mm diameter DR35 PVC leads with heavy duty steel flap gates. Work includes supply and installation of stone erosion protections (SEP) including new filter fabric underlay on drain bank at pipe outlets (approximately 10 m ²)	1.0	Lump Sum	\$ 5,000.00	\$ 5,000.00
9.	Temporary silt control measures during construction	1.0	Lump Sum	\$ 2,000.00	\$ 2,000.00
SUBTOTAL FOR OPEN DRAIN WORKS= \$ 124,400.00					
CLOSED DRAIN WORK					
10.	Relocation of single story, slab-on-grade garage structure (approximately 13.5 m long and 5.5 m wide) located on 671 Ambassador Beach Road to a location approximately 40 m away within 673 Ambassador Beach Road. Works to include clearing of new area necessary for the works, stripping and stockpiling of topsoil, and construction of a new foundation to receive the new garage and concrete floor. Contractor to disconnect overhead power supply and reconnect to 673 Ambassador Beach Road service, including coordination and permitting with public utility. Contractor shall submit plans for relocation and foundation for review and approval prior to commencement of works. Contractor is responsible for acquiring all necessary permits to complete the works, including building permit. Works shall be in conformance with the Ontario Building Code. The existing foundation is to be removed, and the area restored.	1.0	Lump Sum	\$ 55,000.00	\$ 55,000.00

Item	Description	Est Qty	Unit	Unit Price	Total
11.	Supply & installation of reinforced concrete slab foundation shed over granular base (3.3 m wide x 3.3 m long) for prefabricated shed (supplied by landowner). Contractor shall coordinate with landowner at the time shed delivery. Contractor shall install electrical service including interior light and 15A receptacle. Concrete pad design to be completed by Contractor and submitted to Project Engineer for review and approval.	1.0	Lump Sum	\$ 3,000.00	\$ 3,000.00
12.	Removal of 1200 mm diameter tree at approximately Station 0+015.0.	1.0	Lump Sum	\$ 3,000.00	\$ 3,000.00
13.	Isolation of drainage works from Lake Erie and dewatering. Contractor to submit a plan for work isolation and for sediment and erosion control for work at the outlet prior to construction.	1.0	Lump Sum	\$ 75,000.00	\$ 75,000.00
14.	Removal and salvage (as possible) existing armour stone in area of outlet pipe.	1.0	Lump Sum	\$ 3,500.00	\$ 3,500.00
15.	Removal and disposal of existing baffle wall at outlet	1.0	Lump Sum	\$ 3,000.00	\$ 3,000.00
16.	Removal and disposal of approximately 75 m of 900 mm diameter pipe and catchbasin off-site as shown on Drawings. Backfill trench with compacted native material.	1.0	Lump Sum	\$ 11,300.00	\$ 11,300.00
17.	Supply and placement of 2 tonne (minimum dimension 1m) armour toe stones (approximately 90 tonnes) at the toe of slope overtop non-woven geotextile (800R Terrafix or approved equal) as shown on the Drawings.	1.0	Lump Sum	\$ 36,000.00	\$ 36,000.00
18.	Supply and placement of 1-2 tonne (minimum dimension 0.6 m) armour stone (approximately 130 tonnes) overtop R-10 rip rap with minimum thickness of 300 mm (approximately 70 tonnes) placed over top non-woven geotextile (800R Terrafix or approved equal) as shown on the Drawings.	1.0	Lump Sum	\$ 48,900.00	\$ 48,900.00

Item	Description	Est Qty	Unit	Unit Price	Total
19.	Supply and install 1500 mm diameter concrete pipe (65-D), 73.2 m long complete with 10 degree bend, catchbasin tee with heavy duty cast iron grate, and bedding and backfill as shown on Drawings (Station 0+006.2 to Station 0+079.4). Work to include securing pipe joints within 9 m of outlet with frost strapping as shown on the Drawings. Pipe to include two (2) prefabricated cored 'Teas' at Station 0+030.0.	1.0	Lump Sum	\$ 191,700.00	\$ 191,700.00
20.	Supply and installation of prefabricated 1500 mm diameter pipe mounted steel grate over pipe outlet, as fabricated by Kent Fabricators (or pre-approved equal). Shop drawings shall be submitted by the Contractor to the Project Engineer for review prior to fabrication	1.0	Lump Sum	\$ 2,900.00	\$2,900.00
21.	Supply and install one (1) - 600 mm diameter HDPE yard catchbasin complete with heavy duty steel grate and 200 mm diameter DR35 PVC lead with backwater control valve at Station 0+030.0. Work includes installing a second tap connection in main drain for future drainage connection.	1.0	Lump Sum	\$ 3,000.00	\$3,000.00
22.	Construct 57 m long berm, approximately 0.4 m high, complete with topsoil, fine graded and seeded (residential mixture).	1.0	Lump Sum	\$ 1,500.00	\$1,500.00
23.	Remove and dispose of existing concrete block end wall at Station 0+079.4. Supply and install new vertical interlocking engineered concrete block end wall, facilitator blocks around pipe and special stair access block as supplied by Underground Specialties Inc. (or pre-approved equal) consisting of approximately 60 concrete blocks (1200 mm x 600 mm x 600 mm blocks). Interlocking concrete block end wall to be designed by Contractor. Shop drawings sealed by a professional engineer licensed in the Province of Ontario shall be submitted by the Contractor to the project engineer for review prior to materials delivered to site.	1.0	Lump Sum	\$ 40,000.00	\$ 40,000.00
24.	Supply and installation of 18 m long, 1.07 m high steel guardrail on top of block headwall, including lockable access gate. Handrail to be designed by Contractor. Shop drawings shall be submitted to Project Engineer for review and approval.	1.0	Lump Sum	\$ 12,600.00	\$ 12,600.00

Item	Description	Est Qty	Unit	Unit Price	Total
25.	Construct berm behind headwall Station 0+079.4 and connect with existing berms on shown on Drawings.	1.0	Lump Sum	\$ 1,900.00	\$ 1,900.00
26.	Supply and installation of 3000 mm long, 2100 mm wide, and 2100 mm high prefabricated steel trash screen over the 1500 mm diameter closed drain inlet pipe, 900 mm wide removable steel honeycomb grate top. The trash screen is to be mounted to a 3150 mm long, 2400 mm wide, and 200 mm thick cast-in-place reinforced concrete slab ovetop a 300 mm thick granular 'A' compacted base. The Contractor may elect to use pre-cast concrete slabs at his expense.	1.0	Lump Sum	\$ 15,600.00	\$ 15,600.00
27.	Replace catchbasin outlet pipes (150 mm and 200 mm diameter) near Station 0+079.4 with new DR35 PVC pipe. Work also includes supply and installation of coupler and heavy-duty steel flap gates on outlet pipes. Backfill to be native or imported compacted clay.	1.0	Lump Sum	\$ 2,000.00	\$ 2,000.00
28.	Restoration of all disturbed areas with salvaged topsoil and new grass seed (residential mixture).	1.0	Lump Sum	\$ 3,000.00	\$ 3,000.00
29.	Maintenance of flows during construction.	1.0	Lump Sum	\$ 5,000.00	\$ 5,000.00
30.	Temporary silt control measures during construction.	1.0	Lump Sum	\$ 1,000.00	\$ 1,000.00
SUBTOTAL FOR CLOSED DRAIN WORKS = \$ 518,900.00					
TOTAL FOR PART A = \$ 643,300.00					

PART B – Colchester Heights Drainage Scheme					
Item	Description	Est Qty	Unit	Unit Price	Total
COLCHESTER HEIGHTS DRAIN					
1.	Supply and install storm sewers:				
a.)	1050 mm diameter concrete pipe (65-D), 54.0 m long complete with Class 'B' bedding and backfill materials as per development specifications.	1.0	Lump Sum	\$ 59,000.00	\$ 59,000.00
b.)	750 mm diameter concrete pipe (65-D), 126.7 m long complete with Class 'B' bedding and backfill materials as per development specifications.	1.0	Lump Sum	\$ 82,600.00	\$ 82,600.00
c.)	600 mm diameter concrete pipe (65-D), 106.1 m long complete with Class 'B' bedding and backfill materials as per development specifications.	1.0	Lump Sum	\$ 63,600.00	\$ 63,600.00
d.)	375 mm diameter PVC pipe (DR-35), 10.2 m long complete with Class 'B' bedding and backfill materials as per development specifications.	1.0	Lump Sum	\$ 5,600.00	\$ 5,600.00
2.	Supply and install storm sewer manholes, as follows:				
a.)	2400 mm diameter precast concrete manhole, complete with oil-grit separator unit (Model FD-8HC as supplied by ADS, or approved equal)	1.0	Lump Sum	\$ 75,000.00	\$ 75,000.00
b.)	1800 mm diameter precast concrete manhole	1.0	Lump Sum	\$ 15,000.00	\$ 15,000.00
c.)	1500 mm diameter precast concrete manhole	1.0	Lump Sum	\$ 12,000.00	\$ 12,000.00
d.)	1200 mm diameter precast concrete manhole (2 required)	1.0	Lump Sum	\$ 14,000.00	\$ 14,000.00
3.	Supply and installation of 1800 mm × 1200 mm concrete ditch inlet catchbasin, with flat top and three (3) 1200 mm × 600 mm OPSD 403.01 grates.	1.0	Lump Sum	\$ 17,000.00	\$ 17,000.00
4.	Stone erosion protection works, as follows:				
a.)	Station 0+163 - Supply and install 90 m ² (minimum 500 mm thick) of R-50 rip rap, including new filter fabric underlay around proposed 1050 mm diameter concrete outlet pipe and in drain for spillway.	1.0	Lump Sum	\$ 18,800.00	\$ 18,800.00
SUBTOTAL FOR COLCHESTER HEIGHTS DRAIN = \$ 362,600.00					

Item	Description	Est Qty	Unit	Unit Price	Total
BRANCH DRAIN					
5.	Supply and install Storm sewers, as follows:				
a.)	750 mm diameter concrete pipe (65-D), 75.3 m long complete with Class 'B' bedding and backfill materials as per development specifications.	1.0	Lump Sum	\$ 48,800.00	\$ 48,800.00
b.)	600 mm diameter concrete pipe (65-D), 125.0 m long complete with Class 'B' bedding and backfill materials as per development specifications.	1.0	Lump Sum	\$ 125,000.00	\$ 125,000.00
6.	Supply and install storm sewer manholes, as follows:				
a.)	1500 mm diameter precast concrete manhole	1.0	Lump Sum	\$ 12,000.00	\$ 12,000.00
b.)	1200 mm diameter precast concrete manhole (2 required)	1.0	Lump Sum	\$ 14,000.00	\$ 14,000.00
SUBTOTAL FOR BRANCH DRAIN = \$ 199,800.00					
TOTAL FOR PART B = \$ 562,400.00					

CONSTRUCTION TOTALS SUMMARY	
TOTAL FOR PART A – Langlois-Arner Drainage System (brought forward)	\$ 643,300.00
TOTAL FOR PART B – Colchester Heights Drainage Scheme (brought forward)	\$ 562,400.00
SUBTOTAL	\$ 1,205,700.00
Net HST (1.76%)	\$ 21,220.00
TOTAL FOR CONSTRUCTION =	\$ 1,226,920.00

INCIDENTALS	
Report, Estimates and Specifications	\$ 53,800.00
Survey, Assistance, Expenses and Drawings	\$ 13,500.00
Duplicating Report and Drawings	\$ 2,600.00
Estimated Cost for Letting Contract	\$ 1,800.00
Estimated Cost for Full-Time Inspection, Supervision and Project Management during Construction (approx. 4 weeks duration)	\$ 25,400.00
Net HST on the above items (1.76%)	\$ 1,709.00
Estimate Cost for ERCA Permit	\$ 800.00
TOTAL FOR INCIDENTALS =	\$ 99,609.00
TOTAL FOR LAND TAKEN (brought forward) =	\$ 56,443.00
TOTAL FOR DAMAGES (brought forward) =	\$ 7,975.00
TOTAL FOR CONSTRUCTION (brought forward) =	\$ 1,226,920.00
TOTAL ESTIMATE =	\$ 1,390,947.00

XIII. DRAWINGS AND SPECIFICATIONS

As part of this report, we have included drawings related to the associated Municipal Drains. The drawing set features a watershed plan illustrating the general alignment, watershed boundaries, and all lands and roads within the drainage area. It also includes the design drawings for the proposed improvements, prepared by Dillon Consulting. These drawings further detail the required improvements and ancillary works associated with the Municipal Drains. The design drawings are appended to the back of this report and are referenced herein as **Appendix 'D'**.

Furthermore, Dillon has prepared General Specifications and Special Provisions, which set out the required construction and future maintenance details for the various aspects of the works to be conducted under this report.

XIV. CONSTRUCTION SCHEDULE OF ASSESSMENT

In general terms, all works associated with this project are required and intended to facilitate the creation of a new residential subdivision within the lands currently owned by Colchester Bay Inc. (670-03703). As such, we would recommend that all of the costs associated with the improvements to the Langlois-Arner Drainage System and the creation of the Colchester Heights Drainage Scheme, including all related incidental expenses, be charged entirely against the lands to be developed and per the attached **Construction Schedule of Assessment**.

It should be noted that the attached Construction Schedule of Assessment shall be utilized only for the sharing of all of the costs associated with the work being provided for under this report and said

Construction Schedule of Assessment should not be utilized, under any circumstance, for the sharing of any future maintenance works conducted to any portion of the Municipal Drainage Systems established herein.

XV. FUTURE MAINTENANCE – LANGLOIS-ARNER DRAINAGE SYSTEM

After the completion of all of the work associated with this Engineer's Report, we recommend that the Langlois-Arner Drainage System be administered and maintained by the Town of Essex in the future. All of which shall remain in the proportions therein contained until otherwise varied and/or determined under the provisions of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021" or per subsequent amendments made thereto.

Langlois-Arner Drainage System

Through our review of the governing reports for this Municipal Drain, we identified that multiple reports have been prepared over the years, each outlining specific improvements or additions to the drainage infrastructure within the Langlois-Arner Drainage System. Consequently, the cost distribution in each report was tailored to the specific improvements addressed at the time. As a result, no single governing Schedule of Assessment can be effectively applied to future maintenance activities across the entire system. With the introduction of the development, new properties are being created and the use of the land altered. Therefore, in order to properly distribute any future maintenance costs to the affected lands within the Langlois-Arner Drainage System, we recommend updated Maintenance Schedules of Assessment be provided as attached herein and labelled **Appendix "E"**. It should be clearly understood that the amounts shown within these Schedules are only for prorating future maintenance costs for the drain and do not form part of the current cost for the work.

Based on the parameters of the Langlois-Arner Drainage System, this Municipal Drain has two (2) primary sections of the Municipal Drain. The upstream portion comprises a combination of open channel and covered tile drain, which primarily serves the agricultural lands within the watershed. The downstream portion of this drain consists of an open drain configuration with an enclosed outlet portion into Lake Erie. Therefore, in addition to providing an updated maintenance schedule of assessment for the two (2) primary sections, we have also included a future maintenance schedule for the overall length of the Langlois-Arner Drainage System. Where maintenance provisions have been established, the cost distribution of these portions shall be shared on the following basis:

1. Entire Drain Length (Station 0+000.0 to Station 1+695.8)

When future maintenance works are performed over the entire length of the Langlois-Arner Drainage System, we recommend that it be maintained in the future by the Town of Essex. We further recommend that the cost for these works of future maintenance over the entire length of the drain shall be shared by the abutting landowners and upstream affected lands and roads, following the same proportions established within the "Langlois-Arner Drainage System - Maintenance Schedule of Assessment #1: Entire Drain (Station 0+000 to Station 1+818.1)" attached herein. This Schedule of Assessment has been developed based on an assumed cost of **\$30,000.00**, and the future maintenance costs shall be levied pro-rata to the affected lands and roads. Therefore, when **\$30,000.00** worth of future maintenance work is

expended on the entire length of the drain, the assessment to each of the individual affected property owners and roads shall be levied per the noted Maintenance Schedule of Assessment.

2. Downstream Portion (Station 0+000.0 to Station 0+275.0)

When future maintenance works are performed strictly between Station 0+000.0 to Station 0+275.0 within the Langlois-Arner Drainage System, we recommend that it be maintained in the future by the Town of Essex. This reach of the Municipal Drain extends as an enclosed drain configuration from its outlet into Lake Erie, continuing northeasterly through private lands and the proposed development, to the west side of Ambassador Beach Road. The cost for these works of future maintenance shall be shared by the abutting landowner and upstream affected lands and roads, following the same proportions established within the "Langlois-Arner Drainage System - Maintenance Schedule of Assessment #2: Downstream Portion (Station 0+000.0 to Station 0+275.0)" attached herein. This Schedule of Assessment has been developed based on an assumed cost of **\$10,000.00**, and the future maintenance costs shall be levied pro-rata to the affected lands and roads that are situated adjacent to and upstream of this section of drain for which future maintenance works have been carried out. Therefore, when **\$10,000.00** worth of future maintenance work is expended on this section of the drain, the assessment to each of the individual affected property owners and roads shall be levied per the noted Maintenance Schedule of Assessment.

The attached Future Maintenance Schedule of Assessment for this downstream portion of the Langlois-Arner Drainage System shall be utilized only for the maintenance of the open channel and enclosure portion, together with all associated drainage features that form part of the drainage system. The maintenance work would generally include the enclosure pipes, all associated catchbasins, flapgates and trash grates, outlet structures, all berms, any quarried limestone and armour stone erosion protection, together with the clay backfill, topsoil topping, granular driveways and laneways. The downstream portion functions as an integrated section, and any costs related to spot cleanout or maintenance in this area shall be distributed in accordance with the established assessment schedule.

3. Upstream Portion (Station 0+275.0 to Station 1+695.8)

When future maintenance works are performed strictly between Station 0+275.0 to Station 1+695.8 within the Langlois-Arner Drainage System, we recommend that it be maintained in the future by the Town of Essex. This reach of the Municipal Drain extends from the west side of Ambassador Beach Road, continuing upstream as an open channel configuration in a northeasterly direction across Ambassador Beach Road and County Road. At a point upstream of County Road 50, the Municipal Drain continues as a covered drainage system to its top end at the midpoint of Lot 88. The cost for these works of future maintenance shall be shared by the abutting landowner and upstream affected lands and roads, following the same proportions established within the "Langlois-Arner Drainage System - Maintenance Schedule of Assessment #3: Upstream Portion (Station 0+275.0 to Station 1+818.1)" attached herein. This Schedule of Assessment has been developed based on an assumed cost of **\$10,000.00**, and the future maintenance costs shall be levied pro-rata to the affected lands and roads that are situated adjacent to and upstream of this section of drain for which future maintenance works have been carried out. Therefore, when **\$10,000.00** worth of future maintenance work is expended on this section of the drain, the assessment to each of the individual affected property owners and roads shall be levied per the noted Maintenance Schedule of Assessment.

The attached Future Maintenance Schedule of Assessment for the upstream portion of the Langlois-Arner Drainage System shall apply only to the maintenance of the open channel, drainage structures (catchbasins and maintenance holes), drainage tile, associated headwalls, and all other drainage features that form part of the system. If spot maintenance is performed within the specified area of this portion of the Municipal Drain, it is recommended that only those lands adjacent and upstream of the maintenance site be assessed for any future costs.

It shall be noted that these schedules shall not be utilized for any other maintenance and repair works being conducted to any of the existing access or roadway crossing structures. These existing structures are to be assessed in a different fashion, as outlined below.

Langlois-Arner Drainage System – Road Crossings

Aside from the enclosed portions of the drainage system, there appears to be no drain crossings over the Langlois-Arner Drainage System that serves an individual property. However, there appears to be roadway crossings within the Municipal Drainage System. As such, a mechanism shall be established to address the future repair and/or replacement of these drainage structures.

At County Road 50, a road crossing structure exists within the right-of-way and serves a public roadway under the jurisdiction of the County of Essex. Therefore, under no circumstances shall any of the costs for the maintenance or replacement of this structure be assessed to any upstream lands or roads within the drain's watershed. Furthermore, when future maintenance is required to these structures, the governing road authority or public utility may elect to carry out the future works on these structures using their own forces, through Section 69 of the Drainage Act, if they choose to do so. If this structure is to be replaced under an Engineer's Report through Section 78 of the Drainage Act, it is recommended that Section 26 be utilized for the increased cost to the project as a result of their existence.

An existing private road crossing is located over the Langlois-Arner Drainage System, approximately 150.0 metres south of County Road 50. This structure appears to have been previously identified in the 1940 Engineer's Report for the Langlois-Arner Drainage System. For the purposes of this report, our review of the structure was limited to confirming its existence and documenting its current size, type, and location. Under no circumstances shall the Consulting Engineer, the Municipality, or the drainage system be held responsible for the structural integrity of this private structure. Given its size and function, it is recommended that any future repair or replacement be reviewed by a qualified engineer. Additionally, any future replacement should be undertaken through an Engineer's Report pursuant to Section 78 of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021".

Langlois-Arner Drainage System - Working Corridors and Access Routes

Access routes and working corridors have either been established in previous By-Laws or established within this Engineer's Report to help facilitate the necessary drainage improvements and future maintenance of the Langlois-Arner Drainage System. The lands in which these working corridors and access routes have been established have currently or previously been compensated for and shall remain in perpetuity for initial construction and future maintenance works on the Langlois-Arner Drainage System. Therefore, when construction and/or future maintenance works are being conducted, the Contractor shall be expected to keep all future equipment and forces within the established working corridors for any future maintenance performed on the Langlois-Arner Drainage System.

XVI. FUTURE MAINTENANCE – COLCHESTER HEIGHTS DRAINAGE SCHEME

After the completion of all of the work associated with this Engineer's Report, we recommend that the Colchester Heights Drainage Scheme be administered and maintained by the Town of Essex in the future. All of which shall remain in the proportions therein contained until otherwise varied and/or determined under the provisions of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021" or per subsequent amendments made thereto.

Based on the configuration of the new Colchester Heights Drainage Scheme, the Municipal Drain comprises three (3) primary sections: a main drain, a branch drain, and a shared outlet. While the system includes both a main and a branch drain, they converge at a common outlet that forms part of the main drain. Accordingly, we have established Maintenance Schedules of Assessment for each primary section. The cost distribution for these portions shall be shared on the basis outlined below and further detailed in the new Maintenance Schedules of Assessment, attached herein as **Appendix "E"**. It should be clearly understood that the amounts shown within these Schedules are only for prorating future maintenance costs for the drain and do not form part of the current cost for the work.

Colchester Heights Drain

When future maintenance is performed on the Colchester Heights Drain (west leg of Street 'A'), between Station 1+057.0 and Station 1+300.6, as identified within the accompanying drawings and under this report, we recommend that it be kept up and maintained in the future at the expense of the lands and road outlined in the "Colchester Heights Drainage Scheme - Maintenance Schedule of Assessment: Colchester Heights Drain (Station 1+057.0 and Station 1+300.6)" attached herein. This Schedule of Assessment has been developed based on an assumed cost of **\$10,000.00**, and the future maintenance costs shall be levied pro-rata to the affected lands and roads that are situated adjacent to and upstream of this section of drain for which future maintenance works have been carried out. Therefore, when **\$10,000.00** worth of future maintenance work is expended on this section of the drain, the assessment to each of the individual affected property owners and roads shall be levied per the noted Maintenance Schedule of Assessment.

The maintenance work would include the drainage pipe, maintenance holes (MH 1 through MH 4), and all other ancillary components such as granular bedding and native fill backfill. Any drainage infrastructure not identified above, or specifically identified in the "Special Drainage Features" section, will be considered a private feature and not form part of the Municipal Drain. Responsibility for the maintenance of any such private features shall rest entirely with the property on which the feature is located and/or the property that benefits from it.

Branch Drain

When future maintenance is performed on the Branch Drain (east leg of Street 'A'), between Station 1+300.6 and Station 1+500.9, as identified within the accompanying drawings and under this report, we recommend that it be kept up and maintained in the future at the expense of the lands and road outlined in the "Colchester Heights Drainage Scheme - Maintenance Schedule of Assessment: Branch Drain (Station 1+300.6 and Station 1+500.9)" attached herein. This Schedule of Assessment has been developed based on an assumed cost of **\$10,000.00**, and the future maintenance costs shall be levied pro-rata to the affected lands and roads that are situated adjacent to and upstream of this section of drain for which future maintenance works have been carried out. Therefore, when **\$10,000.00** worth of future maintenance work

is expended on this section of the drain, the assessment to each of the individual affected property owners and roads shall be levied per the noted Maintenance Schedule of Assessment.

The maintenance work would include the drainage pipe, maintenance holes (MH 5 through MH 7), and all other ancillary work such as granular bedding and native fill backfill. Any drainage infrastructure not identified above, or specifically identified in the "Special Drainage Features" section, will be considered a private feature and not form part of the Municipal Drain. Responsibility for the maintenance of any such private features shall rest entirely with the property on which the feature is located and/or the property that benefits from it.

Outlet Portion

When future maintenance is performed on the outlet portion of the Colchester Heights Drainage Scheme (though Lots 17 and 18), between Station 2+086.0 and Station 2+140.0, as identified within the accompanying drawings and under this report, we recommend that it be kept up and maintained in the future at the expense of the lands and road outlined in the "Colchester Heights Drainage Scheme - Maintenance Schedule of Assessment: Outlet Portion (Station 2+086.0 and Station 2+140.0)" attached herein. This Schedule of Assessment has been developed based on an assumed cost of **\$10,000.00**, and the future maintenance costs shall be levied pro-rata to the affected lands and roads that are situated adjacent to and upstream of this section of drain for which future maintenance works have been carried out. Therefore, when **\$10,000.00** worth of future maintenance work is expended on this section of the drain, the assessment to each of the individual affected property owners and roads shall be levied per the noted Maintenance Schedule of Assessment.

The maintenance work would include the drainage pipe, ditch inlet catchbasin, and all other ancillary work such as granular bedding and native fill backfill. These maintenance works shall also include the overland conveyance swale between Lots 17 and 18, together with the quarried limestone erosion protection associated with the outlet of the drainage system. Any drainage infrastructure not identified above, or specifically identified in the "Special Drainage Features" section, will be considered a private feature and not form part of the Municipal Drain. Responsibility for the maintenance of any such private features shall rest entirely with the property on which the feature is located and/or the property that benefits from it.

Special Drainage Features

We wish to establish that when future maintenance is performed on the Colchester Heights Drainage Scheme, we recommend that all costs associated with drainage features that are specific to the roadway of Street 'A' be kept up and maintained in the future, with the following provisions with respect to cost-sharing:

1. Should any works to the Oil Grit Separator (O.G.S.) system within and including MH8, require replacement, repair or improvements, this structure shall form part of the works and the cost of this feature shall be assessed entirely to the Town of Essex Public Works Department.
2. Should concrete or asphalt roadway, roadway bedding, and/or concrete curb require removal as part of any future maintenance work on the drainage system, these features should be repaired or replaced as part of the work, and the cost of such works shall be assessed entirely to the Town of Essex Public Works Department.

3. Should the roadway catch basins and/or catch basin leads require replacement or repair, these structures shall form part of the works, and the cost of these components shall be assessed entirely to the Town of Essex Public Works Department.
4. Service connections extending from the main trunk to the cleanout located at the right-of-way limit shall be considered part of the Municipal Drain. If repairs or replacement of the Municipal Drain portion of a service connection are required, the associated costs shall be shared equally, **50%** assessed to the Town of Essex Public Works Department and **50%** to the property served by the connection. These shared costs shall be limited to the service connection itself, including granular bedding and native backfill. Any costs related to the removal and replacement of asphalt roadway pavement, roadway base, and/or concrete curb shall be fully assessed to the Town of Essex Public Works Department. It is important to note that the service connection from the cleanout at the right-of-way limit to the dwelling (located on private property) is considered a private feature and does not form part of the Municipal Drain. Any maintenance or replacement costs associated with this private portion shall be the responsibility of the property owner.
5. As noted within the accompanying drawings, each service connection has been strategically located to avoid conflicts with future driveways and private features. If a driveway or private feature is later installed and interferes with a service connection, any affected features must be repaired or replaced as part of the work. Similarly, if these maintenance works impact fencing, landscaping, sprinklers, or other special features, these must also be removed and restored or replaced. However, all costs related to the supply and installation of any surface material other than native soils, as well as the removal, restoration, or replacement of special features, shall be fully assessed to the adjoining Owner benefiting from the service connection.

XVII. SCHEDULES OF ASSESSMENT RATIONALE

We have prepared Schedules of Assessment to be used for allocating costs to the affected lands and roads for any future maintenance work carried out on the associated Municipal Drains, as previously identified in this report. These schedules have been developed based on established precedence and industry standards to ensure a fair and consistent approach. As previously noted, the assessment proportions outlined in the Maintenance Schedules of Assessment have been established based on an assumed future maintenance cost for each portion of the Municipal Drains. It should be understood that the charges indicated in the schedules are not to be levied until maintenance work has actually been performed and costs incurred. The actual maintenance costs shall be assessed to the applicable lands and roads in the same relative proportions as indicated in the schedules, subject to any future revisions permitted under the authority of the Drainage Act.

Assessment Components

All individual assessments within the Maintenance Schedules of Assessment consist of two (2) primary and distinct components, as defined under the Drainage Act:

- i. *Benefit is defined as advantages to any lands, roads, buildings or other structures from the construction, improvement, repair or maintenance of a drainage works such as will result*

in a higher market value or increased crop production or improved appearance or better control of surface or subsurface water, or any other advantages relating to the betterment of lands, roads, buildings or other structures, as it relates to Section 22 of the Drainage Act.

- ii. Outlet Liability is defined as part of the cost of the construction, improvement or maintenance of a drainage works that is required to provide such outlet or improved outlet, as it relates to Section 23 of the Drainage Act.

Assessment Rationale

Benefit Assessment - The removal and/or excavation of accumulated sediment within the open channel and enclosed drainage systems will improve water flow through the system. These improvements will enhance the drain's hydraulic capacity and ensure a sufficient outlet. As a result, properties located adjacent to these Municipal Drains will benefit from the improved drainage, reducing the risk of flooding and potential property damage. Accordingly, the Benefit Assessments listed in the Maintenance Schedules of Assessment are levied against properties in close proximity to the drain and/or those receiving additional protection from the system's flood mitigation features, based on the definition provided above.

Outlet Assessment – According to the parameters set within Section 23 of the Drainage Act, all lands which utilize the Municipal Drain as a drainage outlet may be assessed for Outlet Liability. As further outlined within Section 23(3) of the Drainage Act, the Outlet Assessment is "**...based on the volume and rate of flow of the water artificially caused to flow...**". Based on the characteristics of the lands that contribute flow to these Municipal Drains, runoff factors have been applied based on the land use of each property to reflect the actual amount of water that is artificially collected and discharged into this Municipal Drain. Therefore, developed lands (residential, commercial, industrial lots and roads) have an increased run-off factor applied to their assessment. Contrarily, lands which have surface (or subsurface) runoff that exits the watershed, or contains woodlots would have a decreased run-off factor applied to their assessment. Furthermore, additional factors have been included in these outlet assessments that relate to soil types and the location of where each property's runoff enters the Langlois-Arner Drainage System .

XVIII. CONCLUSION

In conclusion, we find that the proposed drainage works outlined in this report are both necessary and feasible to address the identified drainage needs and to support the development of the lands currently owned by Colchester Bay Inc. (670-03703). The details presented herein demonstrate that the proposed system will effectively manage excess water, mitigate potential damage, and provide a legal outlet for the affected areas. The project is expected to yield significant benefits, including improved drainage, increased property value, and a sustainable long-term solution. All works identified within this report shall be carried out through the provisions of the "Drainage Act, RSO 1990, Chapter D.17, as amended 2021.

All of which is respectfully submitted,

N.J. PERALTA ENGINEERING LTD.



Antonio B. Peralta, P.Eng.

ABP/kk

CONSTRUCTION SCHEDULE OF ASSESSMENT

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of		TOTAL VALUE
							Benefit	Outlet	
670-03703	1	Pt. Lot 90	14.22	14.22	5.755	Colchester Bay Inc.	\$ 1,390,947.00	\$ -	\$ 1,390,947.00
Total on Privately Owned - Non-Agricultural Lands.....							\$ 1,390,947.00	\$ -	\$ 1,390,947.00
TOTAL ASSESSMENT				14.22	5.755		\$ 1,390,947.00	\$ -	\$ 1,390,947.00

1 Hectare = 2.471 Acres

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APPENDIX "A"

Supporting Documents from Dillon Consulting

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APPENDIX A-1

Dillon Consulting Technical Memo

The document included in this appendix is currently under review by the Town of Essex and is subject to their approval. Please note that revisions or updates may occur pending the outcome of the review process.

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Memo



To: Tony Peralta, P. Eng., N.J. Peralta Engineering Ltd.
From: Oliver Moir, P. Eng., Dillon Consulting Ltd.
cc: Lindsay Dean, Drainage Superintendent, Town of Essex
Date: 23 May 2025
Subject: Langlois-Arner Drain & Colchester Heights Drainage Scheme – Technical Design Memo
Our File: 21-3105

Introduction

Dillon Consulting Limited (Dillon) was retained by Colchester Bay Inc. to complete a technical design for the improvement of the Langlois-Arner Drain and for the storm sewer network that services the proposed Colchester Heights residential subdivision. The Colchester Heights development (the site) is located at 131 Ambassador Beach Road in the Town of Essex and is approximately 5.8 hectares in area. The site plan includes 52 proposed single detached residential lots, parkland, and roadways.

The proposed stormwater management strategy includes construction of a storm sewer network to service the lands and roads. The storm sewers outlet to the Langlois-Arner Drain, which is a municipal drain consisting of open and closed sections and outlets to Lake Erie in close proximity to the site. Stormwater from the site is proposed to discharge to the Langlois-Arner drain without restriction. The Langlois-Arner Drain therefore requires improvements to safely contain the 100-year storm event. Incorporation of the storm sewers as municipal drains, and improvement of the Langlois-Arner Drain shall be completed pursuant to the Drainage Act under Section 4 and Section 78, respectively. N.J. Peralta Engineering Ltd. (Peralta) was appointed by the Town of Essex to complete the necessary drainage reports under the Act. This memorandum is written to outline the technical design of the storm sewers and Langlois-Arner Drain improvements.

Watershed Description

The Langlois-Arner Drain commences at its upstream end within N. Pt. Lot 88, Concession 1 within the Town of Essex. The drain begins at its upstream end as a tile drain and flows in a southwesterly and southerly direction for approximately 1,200 metres before continuing downstream as an open drain. The open section of drain continues in a southerly direction where it again becomes a closed drain for approximately 75 metres before discharging to its outlet into Lake Erie within Lot 91, Concession 1.

The lands comprising the watershed are mostly agricultural with some residential area in the southwestern regions near Lake Erie. The watershed comprises parts of Lots 87 through 91, Concession 1 and has an area of approximately 118 hectares (292 acres). From the Ontario Soil Survey, the principle surficial soil in the study area is described as Perth Clay and Perth Clay Loam which is characterized to have fair to poor natural drainage.

A strip of Wauseon Sandy Loam also exists across the watershed which is characterized to have poor natural drainage. The topography is smooth to undulating providing some topographic relief. Agricultural lands within the watershed are systematically tiled.

The soils of the lands for the Colchester Heights Subdivision consist of Perth Clay Loam, which is characterized to have poor natural drainage.

Drainage History

- 27 September 2011 by Gerard Rood, P. Eng.: The report recommended improvements to the Langlois-Arner Drain downstream of Ambassador Beach Road including widening of the drain with a bench to provide storage of runoff in order to attenuate the flows. Works also included the replacement of the inlet and outlet portion of the drain as well as construction of a baffle wall within Lake Erie at the outlet to protect the pipe against waves and ice build up as well as sediment build up. A berm was constructed on the southeast bank to protect lands from flooding.
- 10 April 1940 by J. J. Newman, P. Eng.: The report recommended a new drain be constructed to provide adequate drainage to allow for the productive cultivation of the lands. Recommended works included construction of approximately 1,200 metres of tile drain, and improvement of the existing ditch.

Survey and Existing Conditions

Topographic survey of the drain was completed in January 2022 as part of the survey required for the residential subdivision. Additional topographic survey of the drain was completed in May 2023.

Design Considerations (Langlois-Arner Drain Improvements)

In consultation with the Essex Region Conservation Authority (ERCA), the Langlois-Arner Drain downstream of the site must be designed for the 100-year storm event to facilitate the proposed uncontrolled stormwater discharge from the site.

A stormwater management report for the Colchester Heights Subdivision development was completed by Dillon Consulting Limited (April 2023) as part of the site plan approval process that details the existing and proposed drainage conditions of the site and impacts to the receiving drainage system. A subsequent hydraulic analysis memo was completed by Dillon (April 2024) to analyze recommended drain improvements. Recommended improvements to the Langlois-Arner Drain consider this hydraulic design memo, available drainage report history, and through consultation with landowners, the Town of Essex, and the Essex Region Conservation Authority.

The stormwater management report and hydraulic analysis memo outline the following design considerations and results:

- Hydrographs for the runoff from the site and for the upstream Langlois-Arner Drain watershed were calculated using PCSWMM 2021 for the 4-hour duration, 100-year design storm in both the pre-development and post-development scenarios. A HEC-RAS model was developed to calculate the respective 100-year water surface elevations within the drain.

- The lake level considered in the design of the drain improvements was the 25-year return period according to the Ministry of Natural Resource's Great Lakes System Flood Levels and Water Related Hazards publication (February 1989). The lake level assumes no wind setup.
- Calculated water surface elevations in the existing conditions model suggest that the lands northwest of the drain and the drain's cross section provide stormwater storage during the 100-year storm event.
- Calculated water surface elevations in the proposed conditions model are reduced compared to the existing condition and demonstrate that the recommended improvements provide a 100-year level of service to the drain downstream of the site.

Landowner Consultation

Directly affected landowners were consulted during the process of designing the improvements to the Langlois-Arner Drain. Mr. Ron Pniewski was consulted as owner of Mun. Nos. 671 & 673 Ambassador Beach Road which are lake fronting properties that the closed portion of drain flows through, as well as Mr. Paul Marontate as owner of 131 Ambassador Beach Road which fronts the southeast open portion of drain. A summary of meetings held with the directly affected landowners is provided below.

26 April 2023 – Meeting with Ron Pniewski: This meeting provided the landowner with an introduction of the proposed works on 671 & 673 Ambassador Beach Road and to collect information as well as concerns from the landowner that may affect the design of the drain.

11 July 2023 – Meeting with Ron Pniewski: This meeting was held to discuss potential design alternatives, including an auxiliary outlet pipe or open drain. These options were ultimately not pursued.

23 February 2024 – Meeting with Ron Pniewski: This meeting was held to discuss the design of the drain following its acceptance from the Essex Region Conservation. Since the previous meeting, the dwelling on 671 Ambassador Beach Road was damaged beyond repair by a major storm event (August 2023) where the outlet of the drain became blocked with debris. The dwelling was ultimately removed by the landowner.

The dwelling removed did not conform to modern planning requirements, and construction of a similar dwelling that does would not be feasible considering the proximity to the existing drain alignment. To accommodate the constructability of a new dwelling on 671 Ambassador Road in a similar location and of similar size, the alignment of the proposed closed drain was reconsidered to provide sufficient set back from a potential building footprint and was agreed upon by Mr. Pniewski. Mr. Pniewski requested the two mature trees that exist near the property line between 671 and 673 Ambassador Road remain, however the existing structure that houses a hot tub which exists on 673 Ambassador Beach Road may be removed to accommodate the new alignment.

8 March 2024 – Meeting with Paul Marontate: This meeting provided the landowner with an introduction of the proposed works on 131 Ambassador Beach Road and to collect information as well as concerns from the landowner that may affect the design of the drain.

Mr. Marontate was made aware that the berm previously constructed in 2012 would be extended along the southeast drain bank and that trees along the bank would be removed as a result. Catchbasin inlets with backwater protection would also be constructed provide a drainage outlet for storm runoff that currently flows to the drain overland. Mr. Marontate indicated he is generally accepting of the proposed works on his lands.

Mr. Marontate rents out the land as a mobile home park. He explained that permanent structures from the renters are not permitted on his lands, and that renters will be put on notice that any obstructions to the drainage works are to be moved prior to construction.

3 April 2024 – Meeting with Ron Pniewski: This meeting was held to discuss the updated design of the closed portion of drain. Following some minor updates discussed, the reconsidered design was generally accepted by Mr. Pniewski.

1 August 2024 – Meeting with Ron Pniewski: This meeting was held to discuss an updated alignment of the closed portion of drain. Setback requirements from ERCA restrict the area available on the property Mun. No. 671 Ambassador Beach Road for building envelope. The updated alignment is within the setback area as to maximize a potential building footprint on 671 Ambassador Beach Road. This alignment requires the existing garage be relocated or removed. The design discussed was accepted by Mr. Pniewski.

31 October 2024 – Meeting with Ron Pniewski: This meeting was held to discuss a new location for the closed portion of drain following additional consideration to ERCA and Town setbacks. Mr. Pniewski indicated that the existing garage could be relocated to 673 Ambassador Beach Road, also that he wishes to realign the property line between 671 and 673 Ambassador Beach Road. The new location further maximizes a potential building footprint on 671 Ambassador Beach Road. This alignment requires the existing garage be relocated or removed. The design discussed was accepted by Mr. Pniewski.

26 February 2025 – Meeting with Ron Pniewski: This meeting was held to finalize details affecting the landowner's application for a minor variance to the Town of Essex Committee of Adjustment for amending building offset requirements from closed municipal drains under the Town's planning by-law and for adjusting the property line between Mun. Nos. 671 and 673 Ambassador Beach Road.

Recommendations (Langlois-Arner Drain)

We recommend the open portion of the Langlois-Arner Drain from Station 0+079.4 to Station 0+263 be widened in cross section and the drain banks raised, as shown on the Drawings provided herein to facilitate the proposed stormwater management strategy of the site. Widening of the drain provides additional in-line storage and attenuates peak water levels from its current design, and the raised banks/berming provides additional flood protection to the neighbouring lands during major storm events. We further recommend new catchbasins to provide surface drainage to abutting lands on the opposite side of the berm that are currently graded towards the drain. New and existing catchbasins shall be fitted with backwater control gates.

The existing 900 mm diameter pipe closed portion of the Langlois-Arner Drain is recommended to be replaced with a 1500 mm diameter concrete pipe and realigned as shown on the Drawings herein.

The existing pipe and baffle wall at the lake outlet is recommended to be removed. It is not being replaced because Dillon does not consider it an effective solution for preventing sediment buildup. Sediment transport can occur both alongshore (parallel to the shoreline) and cross shore (perpendicular to the shoreline). The baffle wall does not prevent longshore sediment transport. Additionally, the installation of a baffle wall on the lakebed is not aligned with current MNR policies or coastal engineering practices. A concrete pipe embedded within a stone revetment is recommended to withstand loading from coastal hazards, such as waves and ice. The larger diameter pipe without a baffle wall should provide for more effective flushing of any accumulated sediment.

The portion of pipe nearest to the lake is proposed to include a prefabricated tee catchbasin and grate, similar to the existing in-line catchbasin which acts as a point of inspection and maintenance.

On the upstream end, the existing headwall is recommended to be replaced with a new interlocking concrete block wall. Existing residential lands are proposed to be restored to existing conditions.

Within the property Mun. No. 671, the existing garage will require relocation to accommodate the proposed alignment of the drain and is to be relocated to the abutting property Mun. No. 673. The finished floor elevation of the garage is to be set at minimum 176.00 m, as provided by ERCA. A berm is also proposed along the southeasterly and northeasterly property lines to protect neighbouring properties from potential impacts of the new location of the drain. The berm is intended to be tied into future grading of development within Mun No. 671.

Any excess material excavated from the open and closed portion of the drain construction shall be transported to/remain within the development site for use by the landowner. Drain spoils excavated from the drain under future maintenance are recommended to be trucked off-site.

Design Considerations (Colchester Heights Drainage Scheme)

Future lots within the Colchester Heights Subdivision are proposed to be serviced with storm sewers within the internal road allowances of the development. The drainage scheme comprises an area of 5.757 hectares (approximately 14.23 acres) of single-family residential zoned land and is proposed to discharge without any quantity control measures. An uncontrolled release may be safely achieved following improvements to the Langlois-Arner Drain.

A functional servicing report for the Colchester Heights Subdivision development was completed by Dillon Consulting Limited (May 2024) as part of the site plan approval process that details the stormwater conveyance strategy. We have designed the new storm sewer drains considering this report and through consultation with the Town of Essex and the Essex Region Conservation Authority.

The functional servicing report outlines the following design criteria:

- The storm sewer system is designed to convey peak flows from the 5-year storm event and is designed in accordance with the Town of Essex Development Standard Manual.
- Major storm flows that exceed the capacity of the storm sewers are conveyed directly to the Langlois-Arner Drain.
- A 'Normal' level of water quality protection (70% removal of total suspended solids) is recommended for the site.

Recommendations (Colchester Heights Drainage Scheme)

We recommend the proposed storm sewers be constructed in accordance with the Town of Essex Development Standards Manual and be located within the allowances of the future local streets of the subdivision as shown on the Drawings. The drainage system shall consist of a main and branch drain and be referred to as the Colchester Heights Drain and Branch, respectively. The outlet pipe for the Colchester Heights Drain is proposed to intercept and convey the major overland flows to the Langlois-Arner Drain through a ditch inlet catchbasin. A grassed spillway located ovetop of the pipe is also recommended to convey flows to the drain in the case of a pipe failure/blockage and shall be included as part of the drainage works.

An oil-grit separator (OGS) (Model FD-8HC as supplied by ADS or approved equivalent), located within MH8 is recommended to provide a 'Normal' level of water quality protection for the site. This OGS unit shall be incorporated as part of the Colchester Heights Drainage Scheme.

Approvals

The construction and/or improvement to a drainage works, including repair and maintenance activities, and all operations connected therewith are subject to the approval, inspection, by-laws and regulation of all Municipal, Provincial, Federal and other authorities having jurisdiction in respect to any matters embraced by the proposed works. Prior to any construction or maintenance works, the Municipality or proponent designated on the Municipality's behalf shall obtain all required approvals/permits and confirm any construction limitations including timing windows, mitigation/off-setting measures, standard practices or any other limitations related to in-stream works.

Drawings & Specifications

Attached to this report is Schedule 'F', which are Specifications setting out the details of the recommended works, and Schedule 'G', which represents the following drawings that are also attached to this report:

- Sheet 1 of 11: Colchester Heights Drain & Branch Plan
- Sheet 2 of 11: Colchester Heights Drain & Branch Plan & Profile 1
- Sheet 3 of 11: Colchester Heights Drain & Branch Plan & Profile 2
- Sheet 4 of 11: Colchester Heights Drain & Branch Plan & Profile 3
- Sheet 5 of 11: Colchester Heights Drain & Branch Plan & Profile 4
- Sheet 6 of 11: Langlois-Arner Drain Plan and Profile
- Sheet 7 of 11: Closed Drain Detail Plan
- Sheet 8 of 11: Cross Sections
- Sheet 9 of 11: Closed Drain Details
- Sheet 10 of 11: Catchbasin Details
- Sheet 11 of 11: Miscellaneous Details

Respectfully submitted,

DILLON CONSULTING LIMITED

Oliver E. T. Moir, P.Eng.

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APPENDIX A-2

Dillon Consulting Hydraulic Analysis

Note: Due to the size of this attachment, it has not been included in its entirety herein. If you are interested in viewing the associated appendix, please contact the Town for further details.

The document included in this appendix is currently under review by the Town of Essex and is subject to their approval. Please note that revisions or updates may occur pending the outcome of the review process.

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Memo



To: Tian Martin, P. Eng., Essex Region Conservation Authority
From: Oliver Moir, P. Eng., Dillon Consulting Limited
cc: Tony Peralta, P. Eng, N.J. Peralta Engineering Limited
Date: April 5, 2024
Subject: Langlois-Arner Drain Improvements – Hydraulic Analysis (Revision 3)
Our File: 21-3105

Introduction

Dillon Consulting Limited (Dillon) was retained by Colchester Bay Inc. to prepare a stormwater management (SWM) strategy for the proposed residential development located at 160 Ambassador Beach Road in Colchester, Ontario. The SWM strategy includes discharging uncontrolled runoff from the development into the Langlois-Arner Drain. The drain currently has limited capacity and will be required to be improved to safely convey the 100-year post-development flows to Lake Erie. This SWM strategy was selected because the close proximity of the site to the lake allows for a practicable level of drain improvements to achieve the necessary level of service. The purpose of this memo is to document the engineering analysis for the proposed drain improvements only. The SWM strategy for the proposed residential development is documented in a separate report.

Recommended drain modifications shall be implemented in accordance with the provisions of the Drainage Act under the existing appointment for the Langlois-Arner Drain by N.J. Peralta Engineering Ltd (Peralta).

Background Documents

The following documents were referenced when assessing the detailed design recommendations for the Langlois-Arner Drain:

- Flood Inundation Assessment for the Langlois-Arner Municipal Drain (Dillon, March 2022): This report documents an analysis completed to evaluate the existing floodplain area of the Langlois-Arner Drain. The hydrological analysis completed in this report was used in the detailed design assessment of the Langlois-Arner Drain improvements for the proposed Colchester Heights subdivision.
- Stormwater Assessment Report (Dillon, March 2023): This report documents the preliminary SWM strategy for the proposed development.
- Langlois-Arner Drainage System (Peralta, September 2011): This report is the existing by-law for the drain and details its current design. It was used to assess the existing condition of the drain, and to develop the recommended drain improvements.

- Bellcreeft Beach Diversion Drain (Peralta, December 2014): This report is the existing by-law for the Bellcreeft Beach Diversion Drain which is located along the westerly limit of the proposed Colchester Heights subdivision. The drain conveys storm flows around the Bellcreeft Beach residential area, directly to Lake Erie. This report was used to identify existing drainage areas.
- Soil Survey of Essex County (N.R. Richards, A.G. Caldwell & F.F. Morwick, January 1949): This soil survey was used to identify the existing surficial soil conditions of the lands within the Langlois-Arner Drain watershed.
- Great Lakes System Flood Levels and Water Related Hazards (Ontario Ministry of Natural Resources, February 1989): This report was used to identify the design lake water level for the downstream boundary condition in the hydraulic analysis.

Design Criteria

The proposed Langlois-Arner Drain improvements must provide a 100-year level of service for the drain downstream of the Ambassador Beach Road bridge, which includes managing the 100-year water surface elevations (WSEL) within the drain. This criterion was established in consultation with the Essex Region Conservation Authority (ERCA). In accordance with the Windsor/Essex Region SWM Standards Manual, a 25-year return period for the lake level was used as the downstream boundary condition. The design lake level does not include the effects of wind runoff.

Existing Conditions

The Langlois-Arner Drain watershed area is approximately 118 hectares and is predominantly agricultural with some residential areas. The drain commences within the agricultural lands north of County Road No. 50, flowing southerly to its outlet in Lake Erie. The most downstream section is a closed drain through Mun. No. 671 Ambassador Beach Road and is located immediately downstream of the proposed Colchester Heights subdivision. Figure 1 shows the portion of drain adjacent to the site. The existing cross section of the open portion of drain adjacent to the development site includes a 4 metre wide bench on its northwest bank to provide storage within the drain to reduce the risk of flooding adjacent to residential lands, as detailed in the Peralta (2011) report.

The proposed Colchester Heights subdivision site is approximately 5.75 ha and is currently actively cropped agricultural land. Approximately 5.22 ha of the site is currently assessed into the Langlois-Arner Drain while approximately 0.53 ha is assessed into the Bellcreft Beach Diversion Drain.

According to the Ontario Soil Survey, the surficial soils within the Langlois-Arner Drain watershed consists of Perth Clay, Perth Clay Loam, and Wauseon Sandy Loam, which have fair to poor natural drainage.

Hydrologic Analysis

A hydrologic analysis was previously completed for the Flood Inundation Assessment (Dillon, March 2022) to calculate the existing condition peak flows from the Colchester Heights subdivision site and the peak flows in the Langlois-Arner Drain. A critical storm duration analysis was completed as part of that assessment. The 100-year, 4-hour Chicago storm produced the highest peak flow of the evaluated storm durations and distributions.

Figure 2 shows the delineation of existing condition subcatchments. The subcatchment for the Colchester Heights subdivision site only includes the area currently assessed to the Langlois-Arner Drain and has been characterized according to its existing agricultural land use in the hydrologic assessment. Existing condition subcatchment parameters are summarized in Exhibit A.

Separate hydrographs for the 100-year, 4-hour Chicago storm were calculated using PCSWMM for both the upstream drainage area (CA100 & CA101) and for the development site (CA102) to support a dynamic hydraulic analysis (see Exhibit B for calculated hydrographs).

Hydraulic Analysis

A hydraulic analysis was completed for the Langlois-Arner Drain using the Hydrologic Engineering Center's River Analysis System (HEC-RAS) software version 5.0.7 to calculate the peak WSEL in the drain. An unsteady flow analysis was completed to evaluate the effects of storage on the peak WSEL. The drain was modelled commencing at the upstream end of the open drain portion, and downstream to its outlet into Lake Erie. Figure 3 shows the HEC-RAS model schematic.

The model geometry was developed based on LiDAR data, the Langlois-Arner Drainage Report (Peralta, 2011), and topographic survey conducted by Dillon in 2022. The drawings included in the Peralta (2011) report were used to detail the shape and slope of the channel between the surveyed banks where survey could not be collected due to frozen conditions. Manning's 'n' values from Open Channel Hydraulics (Chow, 1959) were selected based on the observed floodplain ground cover. Expansion/contraction coefficients were assigned based on the HEC-RAS Hydraulic Reference Manual.

The existing condition hydrographs developed in the hydrologic analysis were used to represent flows in the drain. The hydrograph representing the drainage area upstream of Ambassador Beach Road was applied at the upstream end of the modelled channel reach at River Station 2170. The hydrograph representing the development site was applied at River Station 852 as a lateral inflow hydrograph. Refer to Figure 3 for the locations of model cross sections by River Station. The River Station value is not associated with the station values within the Draft Drainage Report Drawings, which differ.

The Lake Erie water level was identified as the downstream boundary condition for the hydraulic analysis. The Flood Inundation Assessment (Dillon, March 2022) identified an Average Annual Maximum Monthly Mean WSEL of 174.55 m which was accepted by ERCA. However, a review of the 25-year Lake Erie water level based on the Ministry of Natural Resource's Great Lakes System Flood Levels and Water Related Hazards publication (February 1989) derived a WSEL of 174.62 m. This WSEL was used in hydraulic calculations since it is more conservative. Supporting documentation for the Lake Erie WSEL is provided in Exhibit C appended to this memo.

Existing structures within the Langlois-Arner Drain are summarized below in Table 1 and have been included in the HEC-RAS model.

Table 1: Existing Culvert Summary

Culvert Crossing	River Station	Shape / Material	Size (m)	Length (m)
Front Road	1427	Corrugated Metal Pipe	1.5 \emptyset	15.2
Ambassador Beach Road	913	Rectangular Concrete Box Culvert	2.4 x 1.2	8.0
Closed Drain Portion	133.5	Ultra-Flo Corrugated Steel Pipe/Concrete Pipe*	0.9 \emptyset	86.0

** Closed Drain Portion consists of varying portions of Ultra-Flo Corrugated Steel Pipe and Concrete Pipe of 0.9 m \emptyset , which have similar Manning's n values, and have therefore been represented as one continuous pipe.*

The calculated peak WSELs within the Langlois-Arner Drain are listed in Table 2 below for cross sections that represent locations immediately adjacent to the site (see Figure 3 for cross section locations).

Table 2: Existing Condition Langlois-Arner Drain Calculated Peak 100-Year WSEL

Cross Section (River Station)	WSEL (m)
273	175.49
357	175.49
496.50	175.49
636	175.49
789	175.49
852	175.49

Figure 4 shows the existing conditions peak hydraulic grade line profile. Existing condition cross sections including the calculated peak 100-year WSEL are also appended to this memo.

Proposed Conditions

The proposed SWM strategy for the proposed Colchester Heights subdivision includes improvements to the Langlois-Arner Drain to convey the peak 100-year post-development flows so runoff from the site may be released without on-site stormwater storage. The following proposed drain improvements are illustrated in the attached Draft Drainage Report Drawings:

- Replace the existing 900 mm diameter concrete outlet pipe with a 1500 mm diameter concrete pipe. Due to cover constraints, the proposed pipe invert is embedded approximately 380 mm below the existing channel bottom.
- Expand the existing bench of the drain on the northwest side to increase channel storage and attenuate the peak water levels. A net increase in floodplain storage of approximately 1,400 m³ is proposed.
- Extension of an existing berm along the southeast bank of the drain, providing 0.30 m of freeboard during the 100-year event. Catch basins with flap gates are proposed along the southeast side of the berm to provide an inlet for runoff currently directed towards the drain.

Hydrologic Analysis

A hydrologic analysis was completed in PCSWMM to calculate a hydrograph for the proposed Colchester Heights subdivision site during the 100-year, 4-hour Chicago storm event. The hydrograph calculated for the drainage upstream of County Road No. 50 remained the same.

The proposed condition subcatchment for the development site includes the entire 5.75 hectare site area discharging to the Langlois-Arner Drain, and has been assessed as single-family residential land use. Subcatchment parameters are summarized in Exhibit D appended to this memo. Figure 5 shows the proposed condition subcatchments.

See Exhibit B for the calculated hydrograph of the post-development site.

Hydraulic Analysis

A proposed conditions HEC-RAS model was developed to assess the proposed outlet pipe improvement as well as the additional storage provided by the proposed channel widening. Unsteady flow calculations were subsequently completed to evaluate the peak 100-year WSELs within the drain and compared with existing condition WSELs. Table 3 summarizes the proposed conditions WSELs within the drain adjacent to the Colchester Heights subdivision site.

Table 3: Proposed Condition Langlois-Arner Drain Calculated Peak 100-Year WSEL

Cross Section (River Station)	WSEL (m)	Freeboard (m) (From Top of Berm)
273	175.13	0.32
357	175.13	0.32
496.50	175.13	0.32
636	175.14	0.31
789	175.14	0.31
852	175.15	0.30

Figure 6 shows the proposed conditions peak hydraulic grade line profile. Proposed condition cross sections including the calculated peak 100-year WSEL are also appended to this memo.

The hydraulic analysis results suggest that the proposed drain improvements lower the peak WSEL within the drain by approximately 0.34 m compared to existing conditions. The proposed improvements to the Langlois-Arner Drain and outlet provide a 100-year level of service in the post-development condition.

Conclusion

The proposed Colchester Heights subdivision SWM strategy includes releasing unattenuated post-development peak flows to the Langlois-Arner Drain. The proposed strategy requires improvements to the drain to provide a 100-year level of service. The proposed recommendations include:

- Increasing the amount of stormwater storage within the drain by widening the existing cross section of the drain on the northwest drain bank;
- Increasing the pipe size of the closed portion of drain; and
- Extension of an existing berm on the southeast side for flood protection to the neighbouring lands.

The drain improvement recommendations shall be implemented through the Drainage Act under the appointment of N.J. Peralta Engineering Ltd.

Please do not hesitate to contact the undersigned with any questions, comments, or concerns.

Sincerely,

DILLON CONSULTING LIMITED



Oliver E. T. Moir, P. Eng.
Water Resource Engineer

- Encl:
1. Exhibits A – D
 2. Figures 1 – 6
 3. HEC-RAS Cross Sections (Existing & Proposed)
 4. Draft Drainage Report Drawings
 5. Flood Inundation Assessment for the Langlois-Arner Municipal Drain (Dillon, March 2022)
 6. Stormwater Assessment Report (Dillon, March 2023)

EXHIBITS A - D

Exhibit A: Summary of Subcatchment Parameters (Existing Condition)- PCSWMM

Name	Area (ha)	Flow Length (m)	Slope (%)	Imperv. (%)	Horton's Infiltration Parameters			
					Max. Infiltration Rate (mm/hr)	Min. Infiltration Rate (mm/hr)	Decay Constant (1/hr)	Drying Time (days)
CA100	102.7	2200	0.6	0	50	2.139*	4	7
CA101	5.9	220	0.6	2	50	1.3	4	7
CA102	9.9	380	0.6	2	50	1.3	4	7
HydroSum	0.001	N/A						

* Composite infiltration rate based on areas and soil types (Perth Clay, Perth Clay Loam and Wauseon Sandy Loam)

Exhibit B: Calculated hydrographs from PCSWMM subcatchments

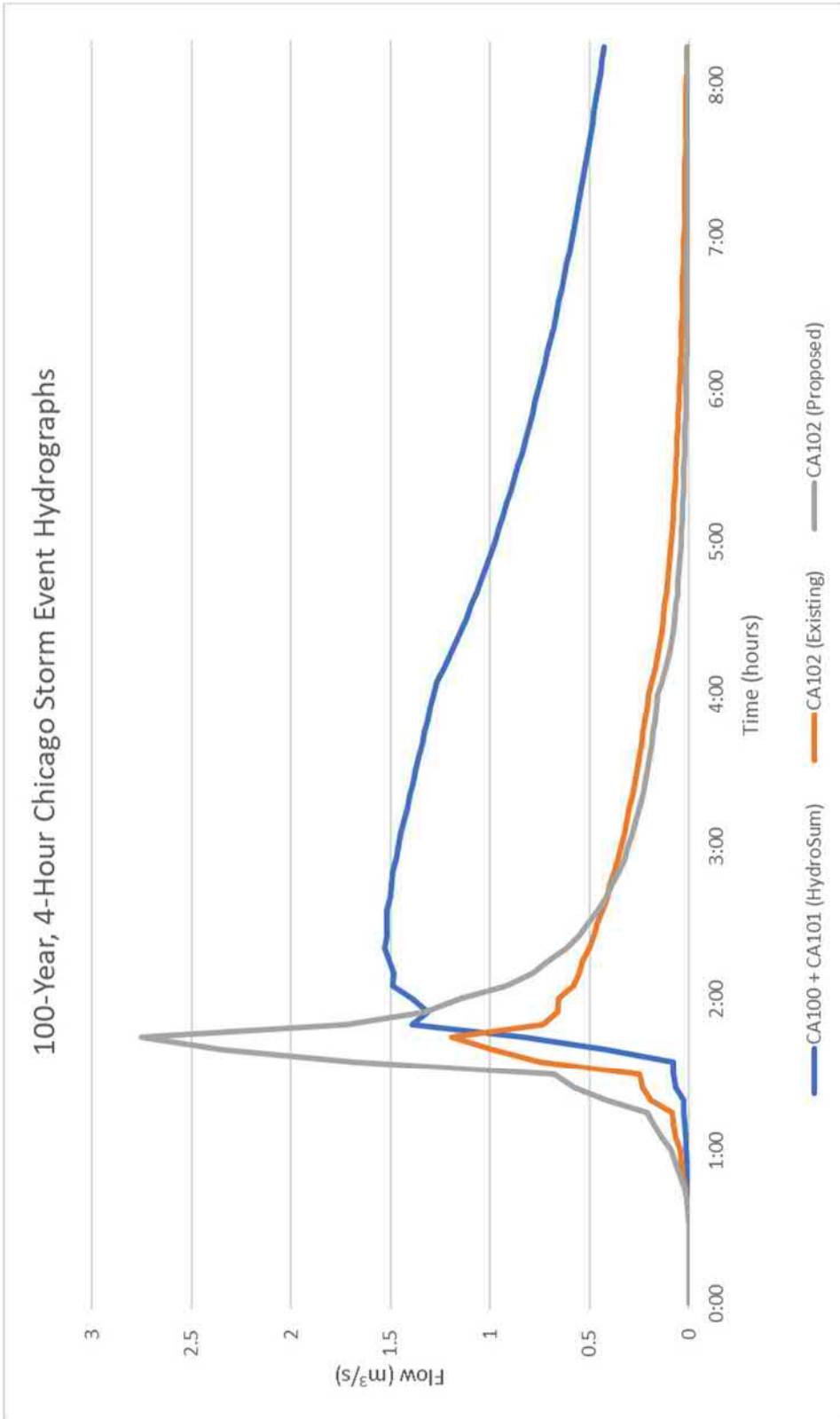


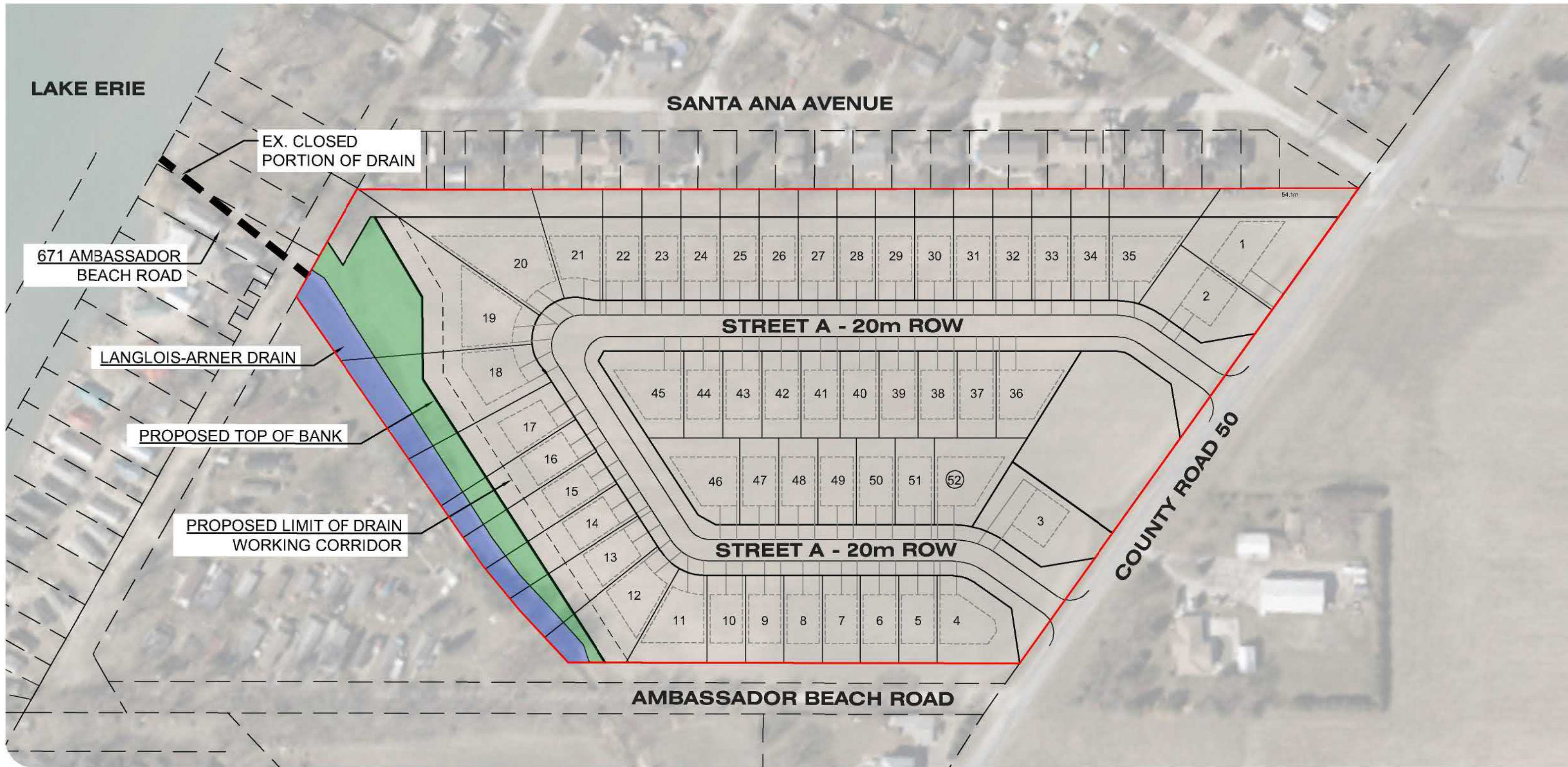
Exhibit C: Tailwater Calculation

	Methodology
1.	From the Great Lakes System Flood Levels and Water Related Hazards (MNRF, February 1989) Table A.2, the Peak Instantaneous Water Level Frequency at the Bar Point Station (Lake Erie, Sector E-1) for the 25-year return period is 175.39m (International Great Lakes Datum, IGLD), and includes wind setup.
2.	From Table A.4 (MNRF, February 1989), 0.98m (Bar Point Station, 25-year) is subtracted to discount wave setup during the 25-year return period.
3.	From Appendix 2 (MNRF, February 1989), 0.21m is added to convert from IGLD to geodetic datum.
4.	$175.39\text{m} - 0.98\text{m} + 0.21\text{m} = 174.62\text{m}$

Exhibit D: Summary of Subcatchment Parameters (Proposed Condition) - PCSWMM

Name	Area (ha)	Flow Length (m)	Slope (%)	Imperv. (%)	Horton's Infiltration Parameters			
					Max. Infiltration Rate (mm/hr)	Min. Infiltration Rate (mm/hr)	Decay Constant (1/hr)	Drying Time (days)
CA100	102.7	2200	0.6	0	50	2.139*	4	7
CA101	5.9	220	0.6	2	50	1.3	4	7
CA102	10.5	380	0.6	60	50	1.3	4	7
HydroSum	0.001	N/A						

FIGURES



LANKOR HORIZONS
160 AMBASSADOR BEACH ROAD

LANGLOIS-ARNER DRAIN PLAN
FIGURE 1

- SUBJECT AREA
(± 5.75 ha / 14.21 ac)
- EXISTING LANGLOIS-ARNER DRAIN
- PROPOSED WIDENED DRAIN BENCH

File Location:
c:\pw working directory\projects 2021\330em\d0105957\l-a drain h&h tech memo -
figure 1.dwg
December, 18, 2023 10:55 PM

SOURCE: THE COUNTY OF ESSEX INTERACTIVE MAPPING (2020)

MAP/DRAWING INFORMATION
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VERIFIED BY AN O.L.S PRIOR TO CONSTRUCTION.
CREATED BY: OEM
CHECKED BY: NE
DESIGNED BY:




PROJECT: 21-3105
STATUS: DRAFT
DATE: 12/18/2023



LANKOR HORIZONS
160 AMBASSADOR BEACH ROAD

**PRE-DEVELOPMENT
SUBCATCHMENTS**
FIGURE 2






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CONSULTING

MAP/DRAWING INFORMATION
THIS DRAWING IS FOR INFORMATION PURPOSES ONLY.

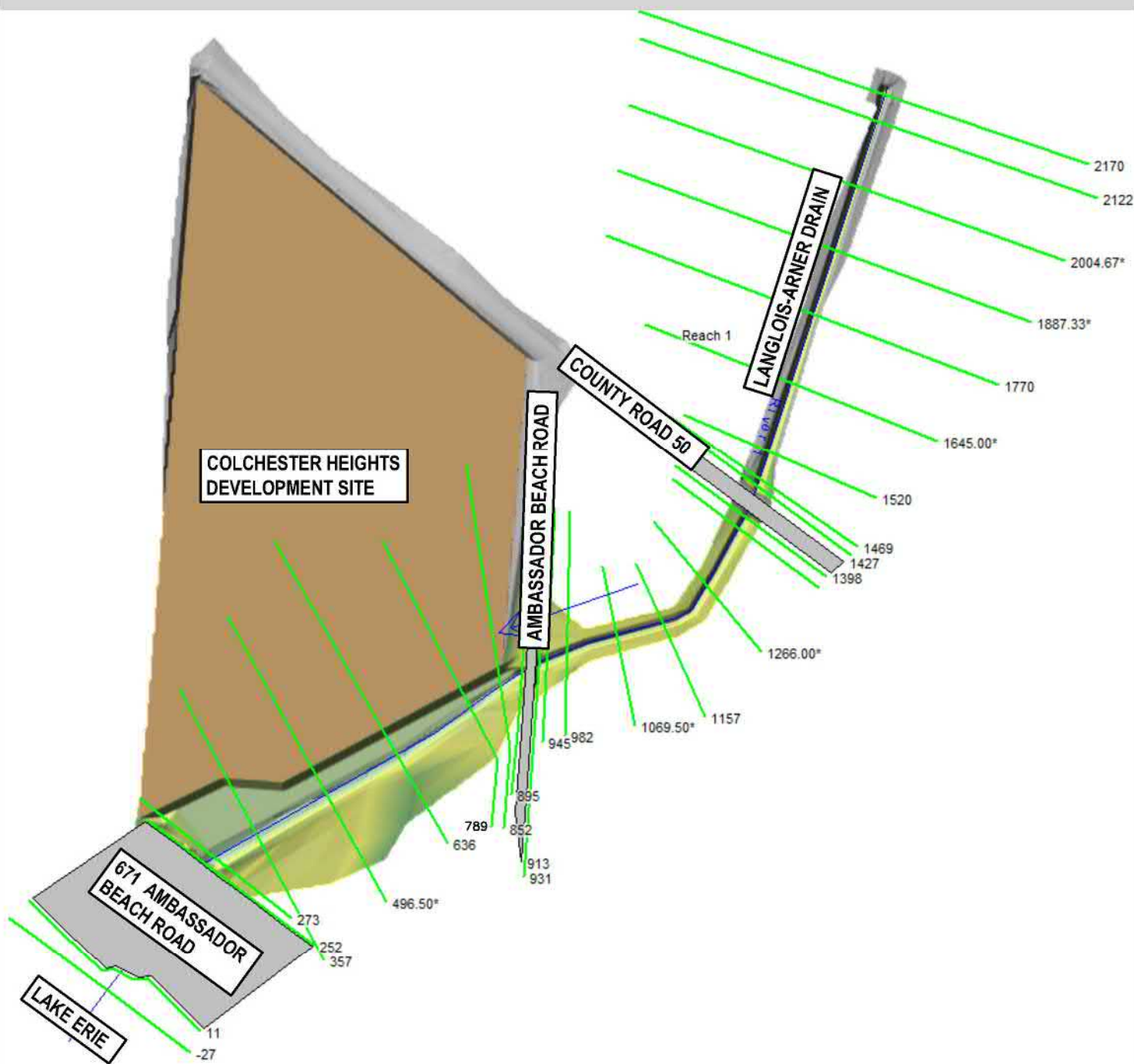
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SCALE
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PROJECT: 21-3105 STATUS: DRAFT DATE: 12/18/2023



LANKOR HORIZONS
160 AMBASSADOR BEACH ROAD

HEC-RAS SCHEMATIC
FIGURE 3

BRIDGE DRAIN ALIGNMENT CROSS-SECTION



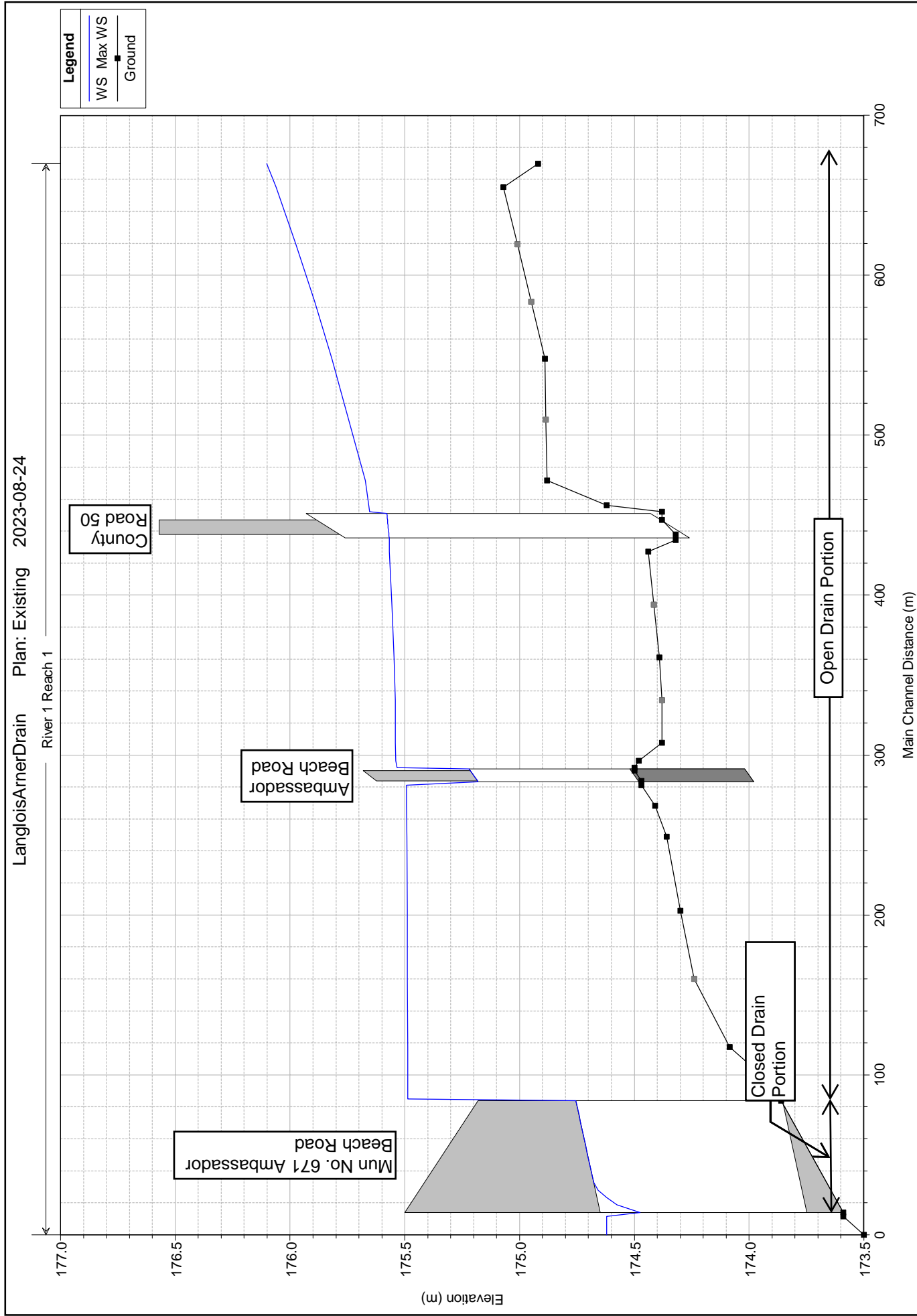
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Figure 4: 100-Year Peak HGL Existing Conditions






LANKOR HORIZONS
160 AMBASSADOR BEACH ROAD

**POST-DEVELOPMENT
SUBCATCHMENTS**
FIGURE 5






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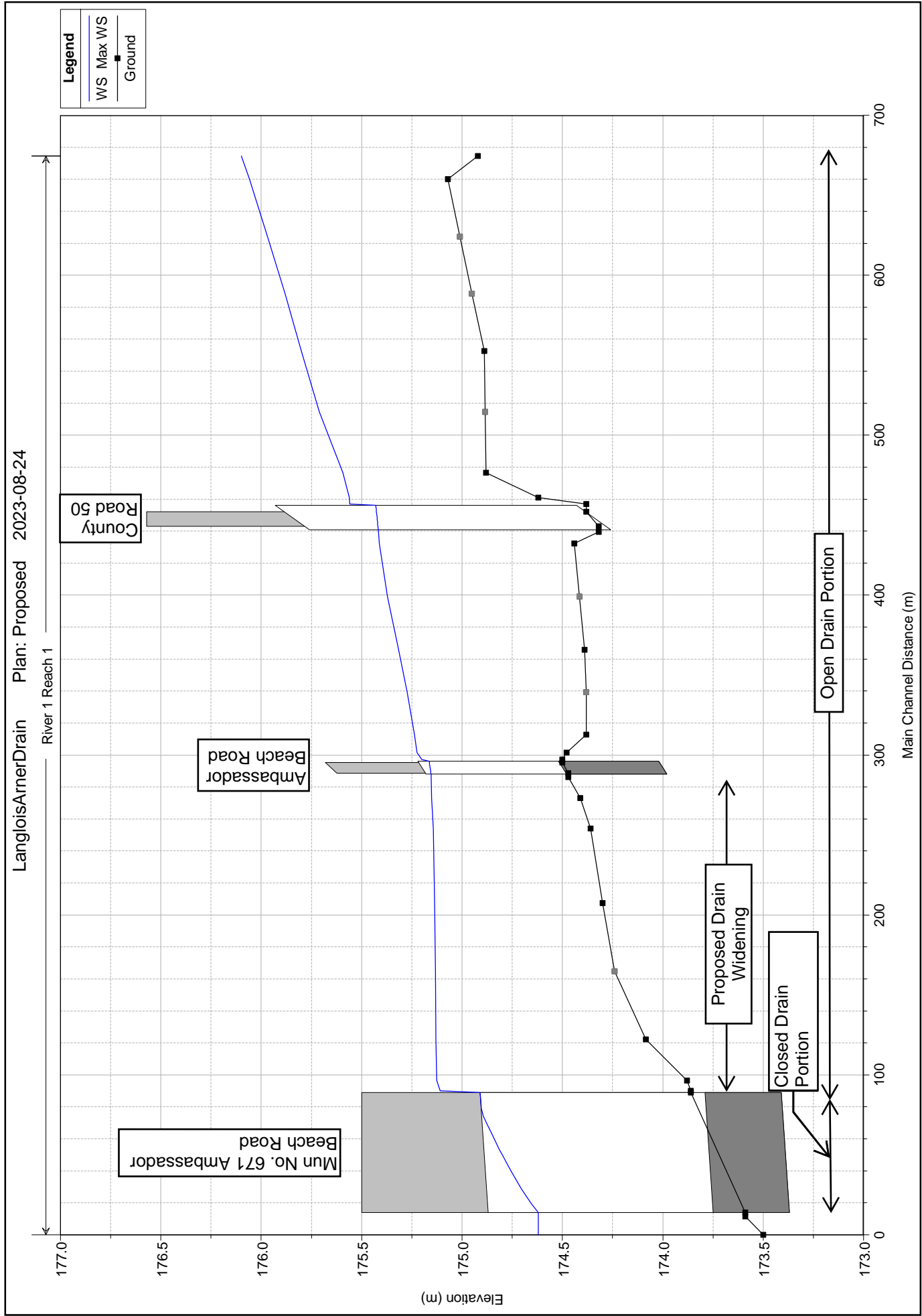
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PROJECT: 21-3105 STATUS: DRAFT DATE: 12/18/2023

Figure 6: 100-Year Peak HGL Proposed Conditions



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APPENDIX A-3

Draft Plan of Subdivision

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JULY 17, 2024
Project No. 21-3105

Draft Plan of Subdivision
Part Of Lots 1 to 11, Part of lot 91, Concession,
FORMERLY IN THE GEOGRAPHIC TOWNSHIP OF
COLCHESTER SOUTH
NOW IN THE TOWN OF ESSEX,
COUNTY OF ESSEX, ONTARIO

Scale: 1:1500 (11x17)
Scale: 1:750 (22x34)

OWNER'S CERTIFICATE
I CERTIFY THAT:
I HEREBY CONSENT TO THE FILING OF THIS PLAN FOR DRAFT APPROVAL.

DATE: JULY 17, 2024 SIGNED: [Signature]
WING ON LI
COLCHESTER BAY INC.

SURVEYOR'S CERTIFICATE
I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND
THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY
SHOWN ON THIS PLAN.

DATE: JULY 17, 2024 SIGNED: [Signature]
ALEC S. MANHA
ONTARIO LAND SURVEYOR

**ADDITIONAL INFORMATION REQUIRED
UNDER S. 51(17) OF THE PLANNING ACT**

- (a) SHOWN ON PLAN
- (b) SHOWN ON PLAN
- (c) SHOWN ON PLAN
- (d) RESIDENTIAL/ COMMERCIAL
- (e) SHOWN ON PLAN
- (f) SHOWN ON PLAN
- (g) SHOWN ON PLAN
- (h) PIPED WATER TO BE INSTALLED BY DEVELOPER
- (i) BROOKSTON CLAY/BERRIAN SAND
- (j) SHOWN ON PLAN
- (k) SANITARY & STORM SEWERS TO BE INSTALLED BY DEVELOPER
- (l) SHOWN ON PLAN

AREAS	LOT/BLOCK	# UNITS	AREA	% of Area
SINGLE DETACHED RESIDENTIAL	1 - 52 (INCL.)	52	= 4.379 ha (10.823 acres)	76.16%
PARKLAND (5%)	53		= 0.286 ha (0.707 acres)	4.97%
0.3 RESERVE	54, 55		= 0.001 ha (0.004 acres)	0.02%
RIGHT OF WAY			= 1.084 ha (2.680 acres)	18.85%
TOTAL AREA			= 5.750 ha (14.214 acres)	

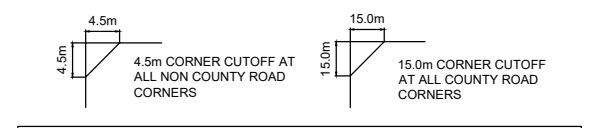


KEY PLAN
N.T.S.

SOURCE: COUNTY OF ESSEX INTERACTIVE MAPPING (2021)

LEGEND

- ALL MONUMENTS SHOWN THUSLY \square IRON BARS (IB) UNLESS OTHERWISE NOTED.
- SIB DENOTES 25mm X 25mm X 1.22m STANDARD IRON BAR
- SSIB DENOTES 25mm X 25mm X 0.61m SHORT STANDARD IRON BAR
- IB DENOTES 16mm X 16mm X 0.61m IRON BAR
- IB ϕ DENOTES 19mm diameter X 0.61m ROUND IRON BAR
- CC DENOTES CUT-CROSS
- CP DENOTES 5mm X 50mm STEEL PIN
- PB DENOTES PLASTIC BAR
- \blacksquare DENOTES SURVEY MONUMENT FOUND
- \square DENOTES SURVEY MONUMENT SET AND MARKED 1744
- WIT. DENOTES WITNESS L DENOTES PERPENDICULAR
- (S) DENOTES SET (M) DENOTES MEASURED (D) DENOTES INST. No.
- ORP DENOTES OBSERVED REFERENCE POINT
- ALL SET SSIB AND PB MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11(4) OF O.REG. 525/91.
- (1744) DENOTES VERHAEGEN SURVEYORS INC., O.L.S.
- (1040) DENOTES WILLIAM J. SETTERINGTON, O.L.S.
- (MTO) DENOTES MINISTRY OF TRANSPORTATION OF ONTARIO, OLS
- (1194) DENOTES JOHN B. SMEETON INC., O.L.S.
- (1172) DENOTES STUBBERFIELD, HARTLEY, BREWER LIMITED, O.L.S.
- (1201) DENOTES CLARKE SURVEYORS INC., O.L.S.
- (1239) DENOTES RALPH W. BARRY, O.L.S.
- (1341) DENOTES RICHARD W. MURRAY, O.L.S.
- (NI) DENOTES NOT IDENTIFIABLE
- (P) DENOTES PLAN 12R-9585
- (P1) DENOTES PLAN 12R-17792
- (P2) DENOTES PLAN OF SURVEY BY (1744) DATED APRIL 2nd, 2002 (F-5546)
- (P3) DENOTES PLAN 12R-13557
- (P4) DENOTES MTO PLAN P-3270
- (P5) DENOTES PLAN 12R-2479
- (P6) DENOTES REGISTERED PLAN 1397
- (P7) DENOTES PLAN 12R-16308
- (P8) DENOTES REGISTERED PLAN 1347
- (FN) DENOTES FIELD NOTES BY (1040) DATED MARCH 13, 1974. (ZA3004)
- (FN1) DENOTES FIELD NOTES BY (1744) DATED MAY 19, 2021 (21-48-098-00)
- H—H DENOTES OVERHEAD HYDRO LINE
- N,E,S,W DENOTES NORTH, EAST, SOUTH, WEST
- UP_w DENOTES WOOD UTILITY POLE
- BF DENOTES BOARD FENCE
- CLF DENOTES CHAINLINK FENCE



"METRIC" DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

BEARING REFERENCE
BEARINGS ARE UTM GRID DERIVED FROM OBSERVED REFERENCE POINTS "A" AND "B" BY REAL TIME NETWORK (RTN) OBSERVATIONS AND ARE REFERRED TO UTM ZONE 17, NAD 83 (CSRS) (2010.0).

DISTANCES ON THIS PLAN ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999910

APPENDIX "B"

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APPENDIX B-1

Essex Region Conservation Authority Correspondence

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Kiara Kirkland

From: Tian Martin <TMartin@erca.org>
Sent: November 27, 2024 1:51 PM
To: Moir, Oliver
Cc: Kyle Edmunds; Dean, Lindsay; Tony Peralta; Kailee Dickson; Melanie Muir; Lina Florian
Subject: RE: Langlois Arner Drain Improvements - ERCA Comments November 22, 2023

Hi Oliver,

Thank you for the clarification. We have no further comments.

Regards,



TIAN MARTIN, P.Eng.
Water Resources Engineer, Watershed Management Services
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311 • Essex, Ontario • N8M 1Y6
P. 519-776-5209 x 304 • F. 519-776-8688
tmartin@erca.org www.essexregionconservation.ca

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Follow us on Twitter: [@essexregionca](https://twitter.com/essexregionca)

From: Moir, Oliver <omoir@dillon.ca>
Sent: Tuesday, November 26, 2024 2:52 PM
To: Tian Martin <TMartin@erca.org>
Cc: Kyle Edmunds <kedmunds@dillon.ca>; Dean, Lindsay <ldean@essex.ca>; Tony Peralta <tony@peraltaengineering.com>; Kailee Dickson <kdickson@dillon.ca>; Melanie Muir <mmuir@dillon.ca>; Lina Florian <LFlorian@erca.org>
Subject: Re: Langlois Arner Drain Improvements - ERCA Comments November 22, 2023

Hi Tian,

The baffle wall provided protection to the CSP UltraFlo outlet pipe from waves and ice. The proposed outlet pipe is reinforced concrete and does not need the same protection being heavier and more robust. In terms of sedimentation, we've consulted with our coastal engineer and we do not feel the wall provides an advantage as the sediment levels in the pipe are determined by the lake levels.

Kind regards,

Oliver

On Tue, Nov 26, 2024 at 2:29 PM Tian Martin <TMartin@erca.org> wrote:

Hi Oliver,

Could you please provide the rationale for why the existing baffle wall will not be replaced?

Thank you,



TIAN MARTIN, P.Eng.

Water Resources Engineer, Watershed Management Services

Essex Region Conservation Authority

360 Fairview Avenue West, Suite 311 • Essex, Ontario • N8M 1Y6

P. 519-776-5209 x 304 • F. 519-776-8688

tmartin@erca.org www.essexregionconservation.ca

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Follow us on Twitter: [@essexregionca](https://twitter.com/essexregionca)

From: Moir, Oliver <omoir@dillon.ca>

Sent: Tuesday, November 26, 2024 2:12 PM

To: Tian Martin <TMartin@erca.org>

Cc: Kyle Edmunds <kedmunds@dillon.ca>; Dean, Lindsay <idean@essex.ca>; Tony Peralta <tony@peraltaengineering.com>; Kailee Dickson <kdickson@dillon.ca>; Melanie Muir <mmuir@dillon.ca>; Lina Florian <LFlorian@erca.org>

Subject: Re: Langlois Arner Drain Improvements - ERCA Comments November 22, 2023

Hi Tian,

I hope you've been well.

The proposed alignment for the closed portion of the Langlois-Arner Drain has been modified (see attached outlet plan). The changes are as follows:

- Drain alignment is 0.5m shorter and has slightly less bend in the alignment. The new alignment requires the relocation of an existing structure on Mun No. 671.
- A berm is proposed for the purposes of protecting adjacent properties from runoff originating from Mun No. 671 which may have another residence constructed on it in the future.
- The outlet of the drain is now located approx 10m south easterly from its current location. The existing baffle wall is not being replaced.

In our opinion, there are no changes to the results of the analysis provided previously.

We are looking to share this plan with adjacent landowners provided ERCA is still in agreement with the proposed design. Kindly advise.

Thank you,

Oliver

On Mon, Apr 8, 2024 at 9:20 AM Tian Martin <TMartin@erca.org> wrote:

Hi Oliver,

Thank you for the update. Our office is in agreement with the changes listed below associated with the Langlois-Arner Drain only. The highlighted point associated with the design of the Colchester Heights subdivision will be reviewed separately through the review of the subdivision design.

Thank you,



TIAN MARTIN, P.Eng.

Water Resources Engineer, Watershed Management Services

Essex Region Conservation Authority

360 Fairview Avenue West, Suite 311 • Essex, Ontario • N8M 1Y6

P. 519-776-5209 x 304 • F. 519-776-8688

tmartin@erca.org www.essexregionconservation.ca

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From: Moir, Oliver <omoir@dillon.ca>
Sent: Friday, April 5, 2024 7:09 PM
To: Tian Martin <TMartin@erca.org>
Cc: Kyle Edmunds <kedmunds@dillon.ca>; Dean, Lindsay <ldean@essex.ca>; Tony Peralta <tony@peraltaengineering.com>; Kailee Dickson <kdickson@dillon.ca>; Melanie Muir <mmuir@dillon.ca>
Subject: Re: Langlois Arner Drain Improvements - ERCA Comments November 22, 2023

Hi Tian,

Please find our updated technical memo for the Langlois-Arner Drain attached. The changes to the memo include:

- Re-describing the tailwater: As we discussed, the memo no longer describes the tailwater as the 25-year return period for Lake Erie. It now instead references Dillon's previous report where a water level of 174.55m was acceptable. Exhibit C still describes how the tailwater was derived since the hydraulic calculations are unchanged.
- Drawing updates:
 - the berm along the south bank is raised to 175.90m
 - the outlet pipe is realigned slightly to better suit the property it traverses
 - updates considering the revised major system design of the Colchester Heights storm outlet

Should technical aspects of the design change, you will be notified and provided an updated set of drawings.

Please let me know if you have any further questions or concerns.

Kind regards,

Oliver

On Fri, Mar 8, 2024 at 9:03 AM Moir, Oliver <omoir@dillon.ca> wrote:

Thank you Tian! Just wasn't sure if there were other minor comments that needed to be addressed.

On Fri, Mar 8, 2024 at 9:02 AM Tian Martin <TMartin@erca.org> wrote:

Hi Oliver,

Other than rewording of the outfall condition methodology as we talked about on the phone, our office has no further comments with respect to the technical component of the Langlois-Arner Drain works. Dillon can proceed with revising the subdivision design to ensure it is consistent with the Langlois-Arner works for further review from our office.

Thanks,

Tian

From: Moir, Oliver <omoir@dillon.ca>

Sent: Friday, March 8, 2024 8:27 AM

To: Tian Martin <TMartin@erca.org>

Subject: Re: Langlois Arner Drain Improvements - ERCA Comments November 22, 2023

Hi Tian,

Is there any chance we would be able to receive your comments ahead of the meeting today?

Thanks,

Oliver

On Thu, Feb 29, 2024 at 12:07 PM Tian Martin <TMartin@erca.org> wrote:

Hi Oliver,

I found this old email. It appears that there were previous discussions regarding what methodology would be appropriate to use between Sarah Zaarour and James Bryant.

Our comment on the last submission was asking why it changed/if there was a change in methodology. We were just looking for clarification on what the new value represented and why there was this change.

As I noted on the phone, difference studies with different purposes can have different boundary conditions for various reasons. The comment was not to imply the value used was not appropriate, more to request clarification on what that new value represented, why it was used and why the existing vs proposed assessments used different boundary conditions.

Thanks,



TIAN MARTIN, P.Eng.

Water Resources Engineer, Watershed Management Services

Essex Region Conservation Authority

360 Fairview Avenue West, Suite 311 • Essex, Ontario • N8M 1Y6

P. 519-776-5209 x 304 • F. 519-776-8688

tmartin@erca.org www.essexregionconservation.ca

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From: Tian Martin

Sent: Thursday, February 29, 2024 11:22 AM

To: Moir, Oliver <omoir@dillon.ca>

Subject: RE: Langlois Arner Drain Improvements - ERCA Comments November 22, 2023

Hi Oliver,

Per our call, please see the historic Lake Erie data:

<https://tides.gc.ca/en/historical-monthly-mean-water-levels-coordinated-network-lake-erie>

Thanks,



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Water Resources Engineer, Watershed Management Services

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From: Moir, Oliver <omoir@dillon.ca>

Sent: Thursday, February 29, 2024 10:09 AM

To: Tian Martin <TMartin@erca.org>

Cc: Lina Florian <LFlorian@erca.org>

Subject: Re: Langlois Arner Drain Improvements - ERCA Comments November 22, 2023

Thank you Tian, much appreciated!

On Wed, Feb 28, 2024 at 3:24 PM Tian Martin <TMartin@erca.org> wrote:

Hi Oliver

The file has been put in queue to be reviewed by both Lina and I and we anticipate this review will be completed in time for the March 8th meeting. If we notice any major issues and have time for a call before the meeting, we will try to reach out but we cannot guarantee that timeline for a possible call.

Thanks,



TIAN MARTIN, P.Eng.

Water Resources Engineer, Watershed Management Services

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From: Moir, Oliver <omoir@dillon.ca>

Sent: Friday, February 23, 2024 11:02 AM

To: Tian Martin <TMartin@erca.org>

Subject: Re: Langlois Arner Drain Improvements - ERCA Comments November 22, 2023

Hi Tian,

I hope all is well. Could you let me know if this review is in your queue and if you expect to have a review completed prior to our March 8th meeting please? We would appreciate a heads up if there are any outstanding issues prior to the call so we may have time to understand them before the meeting and so there aren't any surprises at the meeting.

Thanks,

Oliver

On Fri, Feb 9, 2024 at 5:47 PM Moir, Oliver <omoir@dillon.ca> wrote:

Hello Tian,

We received the Town's comments on January 25th, 2024 and are now re-submitting the hydraulic memo for your review.

The Town provided comments to our responses to ERCA's original comments, as well as additional comments on the proposed design of the drain. These comments are summarized in the updated comment matrix appended to the front of the hydraulic memo (attached). Note that the general design of the drain remains the same and that changes mostly relate to further detailing the drawings.

I've discussed with Lindsay and Tony separately and trust we've addressed the Town's comments. Additional minor modifications to the design are expected as we have our subsequent meeting with landowners, however these changes are not expected to impact the findings of the hydraulic memo.

If anyone cc'd on this email does not receive the attachment due to its size (18.7 MB) or other, please advise and we can find alternative arrangements.

Please do not hesitate to reach out for any questions/comments/concerns.

Kind regards,

Oliver

On Thu, Jan 4, 2024 at 2:17 PM Moir, Oliver <omoir@dillon.ca> wrote:

Hi Tian,

Thank you, and happy new year to you as well.

I have not been provided comments from the Town with respect to the Langlois-Arner Drain. We have received some general comments through other review processes related to the development (i.e. August 14 - Colchester Heights Subdivision - Submission #3), however these comments would not impact the technical review of the proposed drainage works.

If the Town has comments related to the Langlois-Arner Drain that may impact ERCA's review, can the Town please provide them at their earliest convenience?

I am available to discuss as well.

Kind regards,

Oliver

On Thu, Jan 4, 2024 at 10:44 AM Tian Martin <TMartin@erca.org> wrote:

Hi Oliver,

Happy New Year! Our office has received the updated report and it will be put in queue once we receive fee payment.

Can you please confirm that this updated report has also addressed all of the Town of Essex's comments as well? Please include the comments from both offices' and Dillon's response in the comment matrix to ensure that everyone is on the same page and to avoid multiple revisions/reviews.

Thank you,



TIAN MARTIN, P.Eng.

Water Resources Engineer, Watershed Management Services

Essex Region Conservation Authority

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P. 519-776-5209 x 304 • F. 519-776-8688

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From: Moir, Oliver <omoir@dillon.ca>

Sent: Tuesday, December 19, 2023 11:07 AM

To: Tian Martin <TMartin@erca.org>

Cc: Kyle Edmunds (<kedmunds@dillon.ca> <kedmunds@dillon.ca>); Dean, Lindsay (<ldean@essex.ca>); Tony Peralta (<tony@peraltaengineering.com>); Rebecca Belanger (<RBelanger@countyofessex.ca> <RBelanger@countyofessex.ca>); McBeth, David (<dmcbeth@essex.ca>); Girard, Kevin (<kgirard@essex.ca> <kgirard@essex.ca>); Lina Florian (<LFlorian@erca.org>); Alicia Good (<AGood@erca.org>); <dbranch@countyofessex.ca>; <jason.poon@horizoninv.ca>; <lchadwick@essex.ca>; Melanie Muir (<mmuir@dillon.ca>); <rjabbour@essex.ca>; <wingon.li@horizoninv.ca>

Subject: Re: Langlois Arner Drain Improvements - ERCA Comments November 22, 2023

Hi Tian,

Thank you for your comments. Please see our revised memo attached for your review. A comment matrix summarizing ERCAs comments and Dillon's responses is provided at the top of the document.

Please don't hesitate to contact me if you have any questions.

Happy holidays!

Oliver

On Wed, Nov 22, 2023 at 12:25 PM Tian Martin <TMartin@erca.org> wrote:

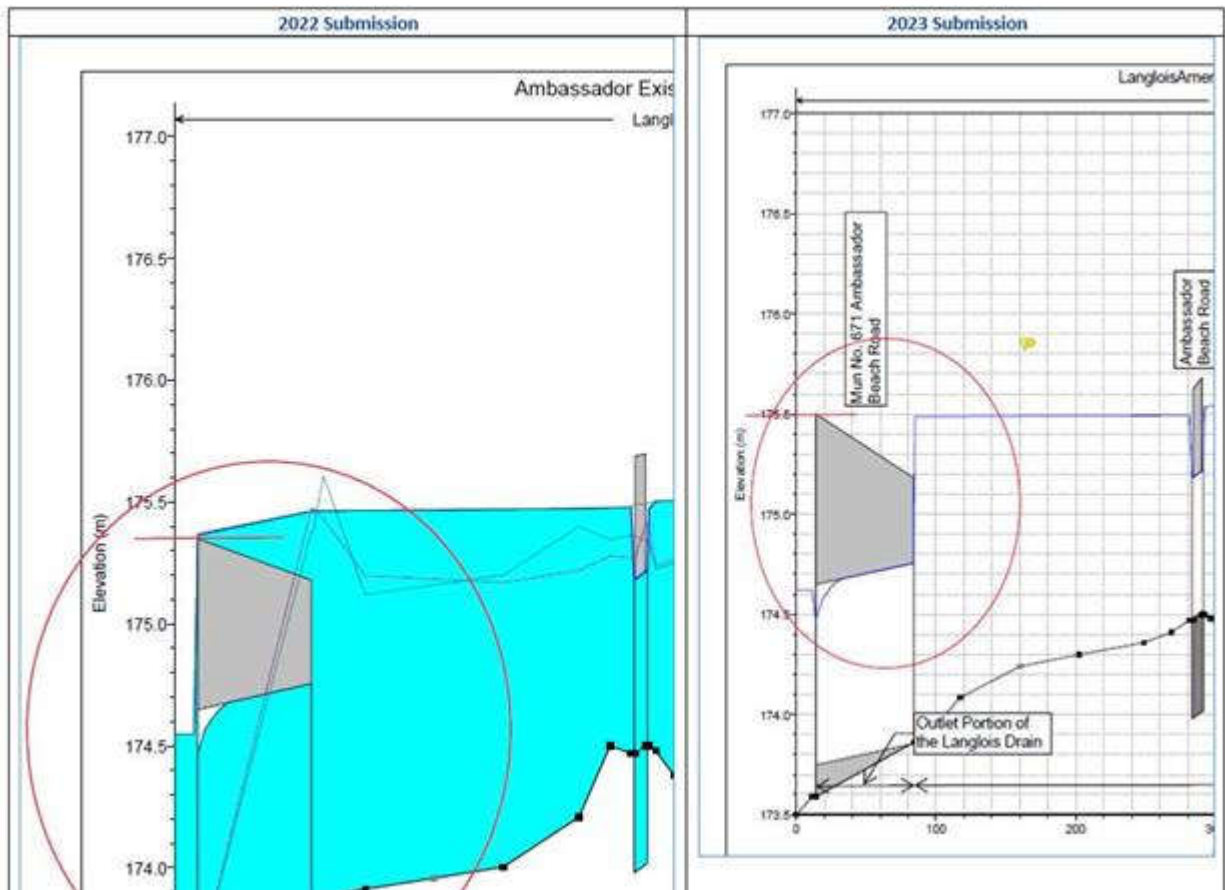
Good afternoon Oliver,

Our office has reviewed the Langlois-Arner Drain Memo dated August 25, 2023 and has the following comments:

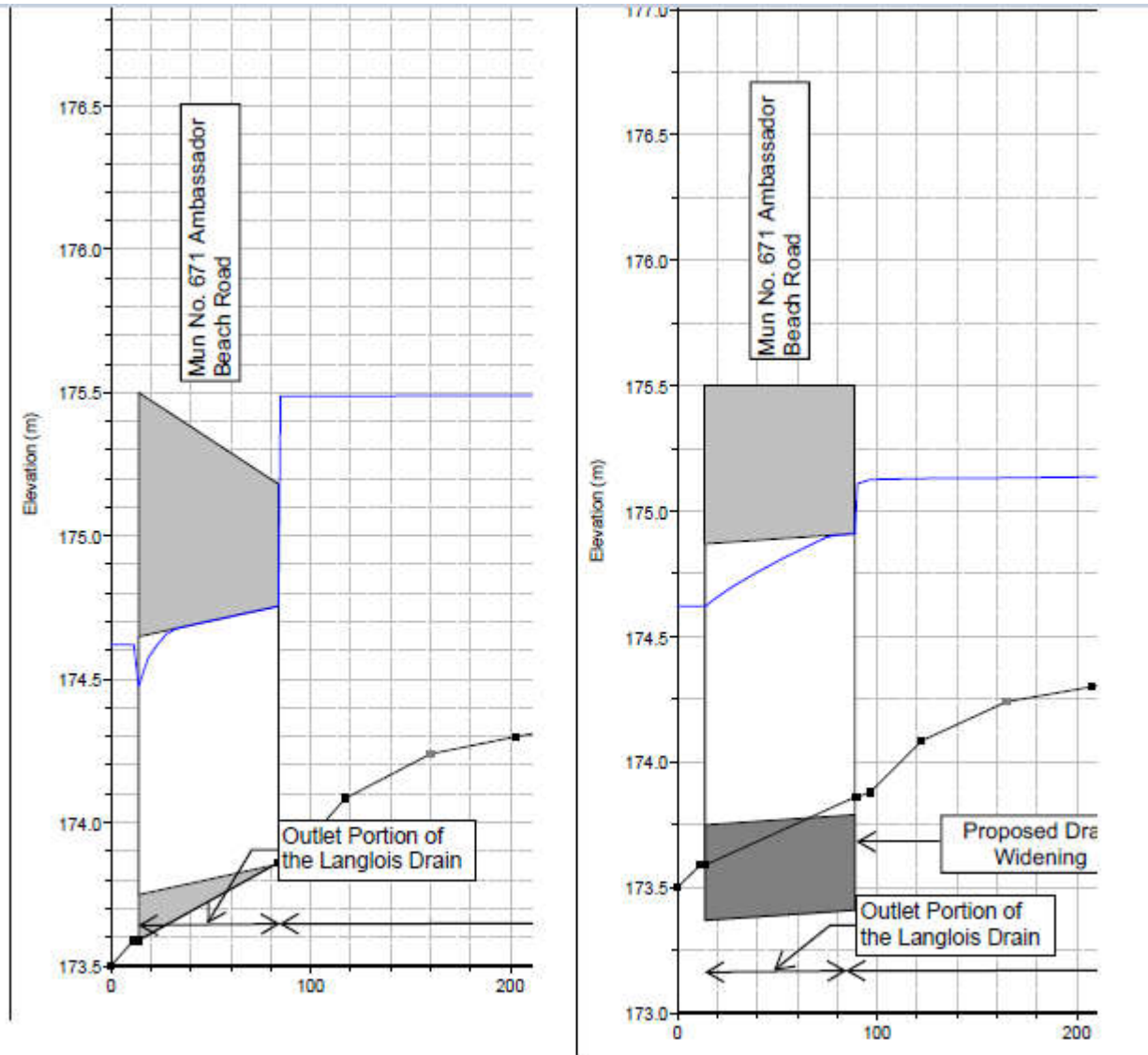
- 1) ERCA's review of the August 2023 Langlois-Arner Drain Improvements encompasses the works on the Langlois Arner Drain only. Once the Langlois Arner Drain improvements are approved, the subdivision design will be required to be updated to coincide with the final Langlois-Arner Drain Improvements and resubmitted to our office for review. ERCA will be providing separate approvals with separate associated fees for the proposed works.
- 2) Our office has received three reports to date that address components of the Langlois-Arner Drain Improvements (March 2022, February 2023, August 2023). The final report submitted to support the final design of the drain should include and clearly present all relevant information required to support the design under one cover.
- 3) Please provide an explanation on the change of assessment (from steady state to unsteady state) from the previous submissions and comment on why it is still appropriate to use the less conservative methodology. It appears that in the February 2023 Colchester Heights Subdivision Stormwater Management Report, the water levels between the existing versus the proposed conditions model did not vary much, however in the recent August 2023 Technical Memo for the Langlois-Arner Drain the values between the two conditions were reduced significantly.
- 4) The proposed upgraded outlet drawings in the August 2023 Technical Memo for the Langlois-Arner Drain show that the invert has been lowered in comparison to the existing outlet configuration.

Has there been considerations in the model for a reduced hydraulic opening area in the proposed culvert as a result?

5) Please confirm the geometry for the existing conditions for Mun No. 671 Ambassador Beach Road. It appears that this has differed in comparison to the earlier assessment. It also appears that there was an overland flow route across Mun No. 671 in the existing scenario in the previous assessment however this is no longer the case in the existing scenario in the August 2023 assessment. Please clarify.



6) Please clarify the geometry of Mun No. 671 Ambassador Beach Road existing versus proposed in this August 2023 assessment. Will fill be brought in and the elevation of this property be raised? Is the owner aware of the proposed regrading and raising of their property? Is this fill required to ensure no overland flow route through private property and if so, will there be spill on adjacent properties?



7) Please specify the methodology used for determining the value used as a tailwater boundary condition. It appears that the value in the August 2023 Technical Memo for Langlois-Arner Drain differs from the March 2022 Colchester Heights Subdivision Flood Inundation Assessment for the Langlois-Arner Municipal Drain.

8) Please provide cross sections of the Hec-Ras model for the proposed condition, similar to what was provided for the existing condition model in the March 2022 Colchester Heights Subdivision Flood Inundation Assessment for the Langlois-Arner Municipal Drain.

9) Sheet 9 notes that the top of bank of the north side is to be completed by others. This work is required to be designed and proposed as part of the works on the drain in this report.

10) Please clarify the works on the berm around the headwall. Sheet 6 does not show any work to the berm however sheet 7 appears to show works to the berm connecting it/wrapping around the headwall to the other existing berm on the north side. Please note the elevation of the proposed berm around the headwall if this is proposed.

11) It was requested by the municipality that the property line be extended to include the Langlois-Arner Drain in previous meetings. Please review the drawings.

12) Please provide cross sections details of the proposed drain in the drawings with the 1:100 year water level and all relevant elevations and measurements.

13) The berm has been extended to protect the houses on the southern property, however catchbasins are proposed to connect through this berm with flapgates. Please comment on if there is a risk associated during the major event with this proposed configuration. Have other designs configurations been considered?

14) CBs on Ambassador Beach Road are proposed to be connected through the protection berm. Is there an opportunity to connect to the sewer?

15) Please ensure that 0.3m of freeboard from the 1:100 year in drain water level to the top of bank/berm on either side is provided. The Top of Bank (North Side) on Sheet 6 does not appear to have this freeboard.

Please provide a comment matrix with your responses to facilitate further review. If you have any questions, please feel free to contact our office.

Regards,



TIAN MARTIN, P.Eng.

Water Resources Engineer, Watershed Management Services

Essex Region Conservation Authority

360 Fairview Avenue West, Suite 311 • Essex, Ontario • N8M 1Y6

P. 519-776-5209 x 304 • F. 519-776-8688

tmartin@erca.org www.essexregionconservation.ca

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APPENDIX B-2

DFO Letter of Advice

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Kiara Kirkland

From: OP Habitat (DFO/MPO) <DFO.OPHabitat.MPO@dfo-mpo.gc.ca>
Sent: April 18, 2023 10:31 AM
To: AnneMarie Moniz
Cc: Tony Peralta; Matthew Shiha; Lindsay Dean
Subject: RE: 23-HCAA-00628 - DFO Request for Review Submission - Langlois Arner Drain Improvements D22-147

Dear Anne Marie:

Subject: [Drain Improvements, Langlois Arner Drain, Class Unrated, Town of Essex] (23-HCAA-00628) – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on March 29, 2023. We understand that you propose to:

- Widen the open portion of the Langlois Arner Drain's west bank; and
- Replace the existing downstream culvert from 0.9m diameter to 1.35m; and
- Complete works during dry/no flow conditions; and
- Work in isolation of flow or open water to avoid sedimentation of the watercourse.

We understand that no aquatic species listed under the *Species at Risk Act* use the area in the vicinity of where your proposal is to be located.

Our review considered the following information:

- Request for Review form and associated documents.

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*;
- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*;

The aforementioned impacts are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures listed below:

- Plan in-water works, undertakings and activities to respect [timing windows](#) to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed and migrate;
 - Work can proceed anytime during dry or no flow conditions
- Maintain an undisturbed vegetated riparian zone between areas of on-land activity and the High Water Mark of any water body;
- Develop and implement an erosion and sediment control plan to avoid the introduction of sediment into any waterbody during all phases of the work, undertaking or activity;

- Conduct all in-water works, undertakings or activities in isolation of open or flowing water to reduce the introduction of sediment into the watercourse;
 - Schedule work to avoid wet, windy and rainy periods (and heed weather advisories) that may result in high flow volumes and/ or increase erosion and sedimentation;
 - Regularly monitor the watercourse for signs of sedimentation during all phases of the work, undertaking or activity and take corrective action;
 - Operate machinery on land in stable dry areas; and,
- Develop and implement a response plan to avoid a spill of deleterious substances.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal will not require an authorization under the *Fisheries Act*, or the *Species at Risk Act*.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, or the *Species at Risk Act*.

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to FisheriesProtection@dfo-mpo.gc.ca or 1-855-852-8320.

We recommend that you notify this office at least 10 days before starting your project and that a copy of this letter be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact Lucas Coletti at Lucas.Coletti@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Lucas Coletti
Biologist | Biologiste
Fisheries and Oceans Canada | Pêches et Océans Canada
Fish and Fish Habitat Protection Program | Programme de Protection du Poisson et de Son Habitat
M: (905)-317-1541
Email/Courriel: Lucas.Coletti@dfo-mpo.gc.ca

From: AnneMarie Moniz <annemarie@peraltaengineering.com>
Sent: Wednesday, March 29, 2023 9:14 AM
To: OP Habitat (DFO/MPO) <DFO.OPHabitat.MPO@dfo-mpo.gc.ca>
Cc: Tony Peralta <tony@peraltaengineering.com>; Matthew Shiha <matthew@peraltaengineering.com>; Lindsay Dean <ldean@essex.ca>
Subject: 23-HCAA-00628 - DFO Request for Review Submission - Langlois Arner Drain Improvements D22-147
Importance: Low

Good afternoon;

Our office has been appointed by the Town of Essex to provide an Engineer's Report, under Sections 4 and 78 of the Drainage Act, for the installation of a new covered drain system together with improvements to the existing open channel and outlet of the Langlois-Arner Drain. This new drainage system and necessary improvements have been requested by the adjacent landowner to facilitate a proposed residential development within the subject lands.

The subject property to be developed is currently an agricultural property south of County Road 50 and immediately west of Ambassador Beach Road and utilizes the Municipal Drain known as the 'Langlois-Arner Drain' as its primary drainage outlet. This open channel portion of the Langlois-Arner Drain is sandwiched between covered portions upstream and downstream and is currently Not Rated by the DFO. Additionally, we have also reviewed the DFO Aquatic Species at Risk maps which identify there may be some Species at Risk near the vicinity of the outlet in Lake Erie.

We have been working in close consultation with the Town of Essex, the Essex Region Conservation Authority (ERCA) and other consultants to continue with the development. At this time, we are seeking input from the DFO to address any comments and concerns as they relate to the Fisheries Act and/or SAR.

Based on the DFO Self-Assessment website, we would kindly request a review of this project.

Please find attached the following documents:

1. "Request for Review" form
2. Appendix 'A' - Maps illustrating the project site and location
3. Appendix 'B' - Photos of the site

We trust that this information is satisfactory to conduct your review. However, we understand that you may have questions and/or concerns. If so, please feel free to contact us using the information provided below.

We look forward to your response

Regards,



Anne-Marie Moniz, Drainage Technician
annemarie@peraltaengineering.com | 519-733-6587 x 126
N.J. Peralta Engineering Ltd. - Consulting Engineers
45 Division St. N., Kingsville ON N9Y 1E1
peraltaengineering.com

IMPORTANT: We have temporarily relocated to Unit 1-38 Erie Street North, Leamington ON N8H 2Z3 during the construction of the new office building at our Kingsville location.

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APPENDIX B-3

MECP Endangered Species and Critical Habitat Submission

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March 29, 2023

Subject: MECP Endangered Species & Critical Habitat Review

I. INTRODUCTION

We have been appointed by the Town of Essex to prepare a Drainage Report under Section 4 and Section 78 of the Drainage Act for the creation of a new Municipal Drain along with improvements to an existing Municipal Drain, to facilitate a residential development in accordance with the Town of Essex requirements. With the construction of a new Municipal Drain, this project does not qualify for the exemption under the Endangered Species Act (ESA) administered through the Ministry of the Environment, Conservation and Parks (MECP). This letter has been prepared to obtain guidance on whether the proposed Municipal Drain requires authorization under the ESA in order to remain in compliance with the Act.

II. LOCATION

The project site and existing Municipal Drain known as the Langlois-Arner Drain is shown in **Appendix "A"**, Figures 1 and 2, is located within the Community of Colchester in the Town of Essex. The subject agricultural property and proposed development site is located on the south side of County Road 50 West immediately west of Ambassador Beach Road.

III. BACKGROUND AND DESCRIPTION OF WORK

With the intention to develop the subject property into a residential subdivision, the affected landowner has petitioned for the creation of a new Municipal Drain to facilitate their development, as required by the Town of Essex. The proposed drainage system is intended to serve the proposed residential development and will discharge into the existing open channel of the Langlois-Arner Drain, and to its outlet into Lake Erie. With the increase in flow from the development, improvements will be required to the Langlois-Arner Drain and its outlet.

The proposed works will include the installation of a new covered drainage system with an outlet into the open channel of the Langlois-Arner Drain. The improvements to the existing Langlois-Arner Drain include widening the entire length existing open channel and upsizing the outlet culvert Lake Erie to account for the additional flows from the development. **Appendix "B"** provides recent photos of the project site, taken February 14, 2023 of the existing open channel of the Langlois-Arner Drain and its outlet into Lake Erie.

IV. ERCA AND DFO CONSIDERATIONS

At the onset of this project, preliminary details of the project were provided to the Essex Region Conservation Authority (ERCA) for initial comments, as a regulatory requirement through the Drainage Act. Based on those comments, no concerns were brought forward regarding Endangered Species or their habitat. Additionally, our office submitted a Request for Review to the DFO. Furthermore, we will continue to be engaged in further correspondence with ERCA and DFO, regarding specific requirements for the approval of the covered drainage system.

V. HABITAT ASSESSMENT AND SPECIES AT RISK RECORDS

Based on MECP's information presented to the Drainage Superintendents of Ontario (DSAO) Member Chapters on June 21st-24th, 2021, we have utilized this information as referenced to conduct our review of Species at Risk data. From our research of the general area pertaining to the proposed Petition Drain, we have reviewed the available screening maps to determine if there is any presence of Species at Risk (SAR). Utilizing the sources provided by MECP, **Appendix "C"** includes a table outlining our findings related to the potential SAR within the project area. In addition to this table, we have also included associated maps that accompany our review. More specifically:

Figure 1: DFO Mapping

Figure 2: Natural Heritage Information Centre Mapping

Figure 3: iNaturalist Community Mapping and Observations

Figure 4: Ontario Breeding Birds Atlas

Figure 5: eBird Birding Community Sightings and Observations Map

Figure 6: Ontario Butterfly Atlas

Figure 7: Ontario Moth Atlas

It has been previously noted that the Town of Essex is known to occupy the Eastern Foxsnake (Carolinian population), Bank Swallow (threatened), and Barn Swallow (threatened). Standard Mitigation and avoidance measures shall be provided to the Contractor, in the event that they come across any of these species.

VI. AVOIDANCE AND/OR MINIMIZATION OF ADVERSE EFFECTS

Under the Endangered Species Act legislation, we understand the importance to protect and/or avoid endangered species and their habitat. As such, we shall make every effort to implement the following minimum requirements related to this project:

- ◆ **Timing Windows** – With this project having aquatic implications, we intend to adhere to the no in-water works timing window set between March 15th and July 15th of any given year.
- ◆ **Avoidance of Key Habitat and Location of Present Work** – Due to the nature of this project, the works proposed under this project carefully considers the implications to endangered species and their habitat. As such, the drainage work is situated where there is the least impact to the affected species.
- ◆ **Sediment Control** - Prior to starting work, a sediment and erosion control plan shall be developed. This will include silt fences or similar, to provide isolation of the work area and prevent sediment materials including silts, clays and sand from entering the drain.
- ◆ **Construction Practices** - Best management practices and procedures will be implemented on-site to ensure a clean worksite with proper machine maintenance and operation for the minimization and containment of spills.

VII. CONCLUSION

Based on our review of the available resources outlined within our letter, we anticipate that there could be species or habitat at risk within the work area. Based on the information outlined throughout this letter, we are asking for guidance by the MECP on whether the proposed Municipal Drain requires authorization under the ESA.

We trust that you find all of the above and enclosed satisfactory; however, should you have any questions relating to same, please contact us immediately. Thank you for your cooperation and assistance with this project, we look forward to receiving your response on how we need to proceed with this project in order to satisfy your Ministry.

All of which is respectfully submitted,

N.J. PERALTA ENGINEERING LTD.



Anne-Marie Moniz

Encl.

cc. Lindsay Dean, Essex Drainage Superintendent

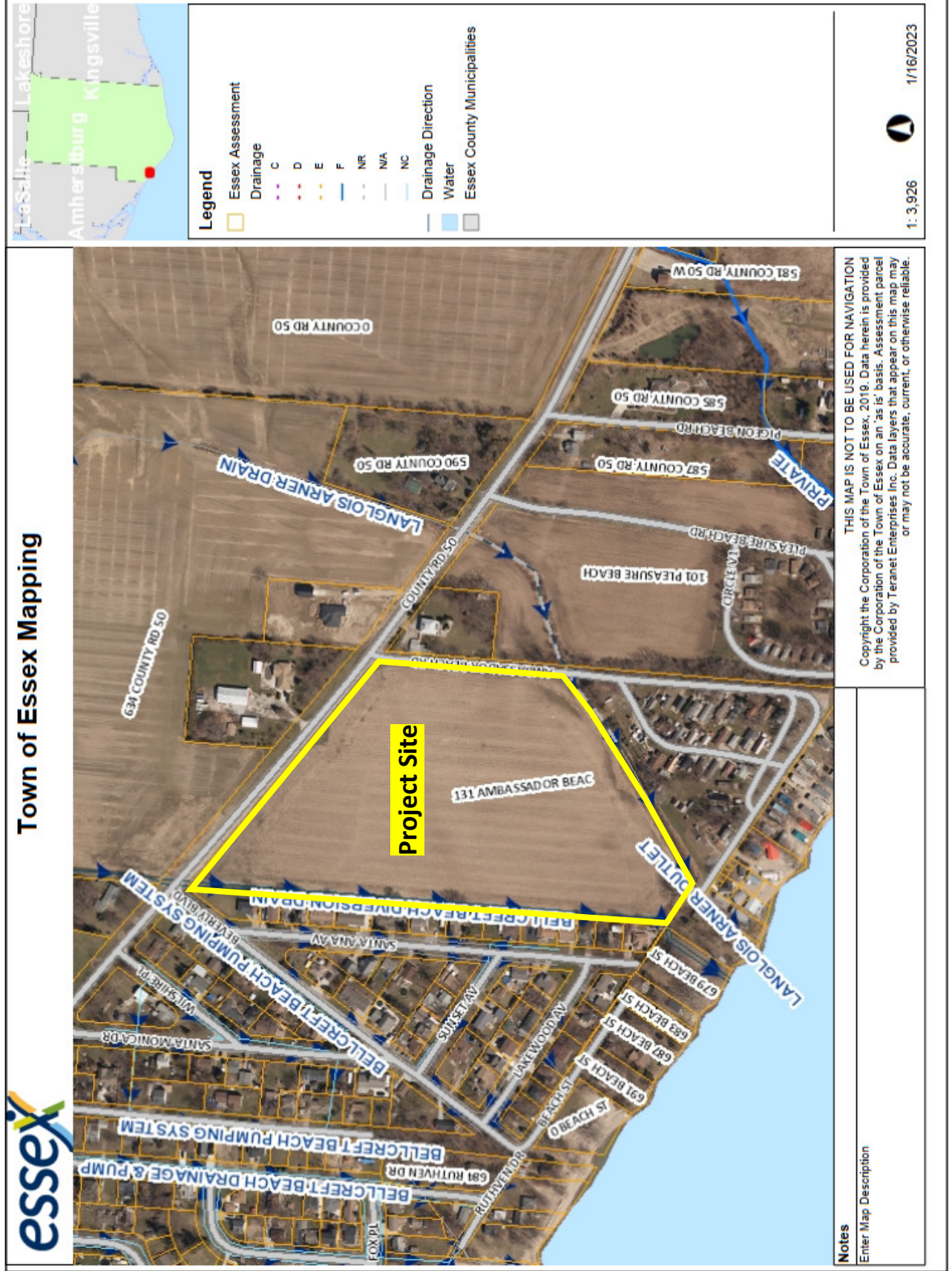
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APPENDIX "A"

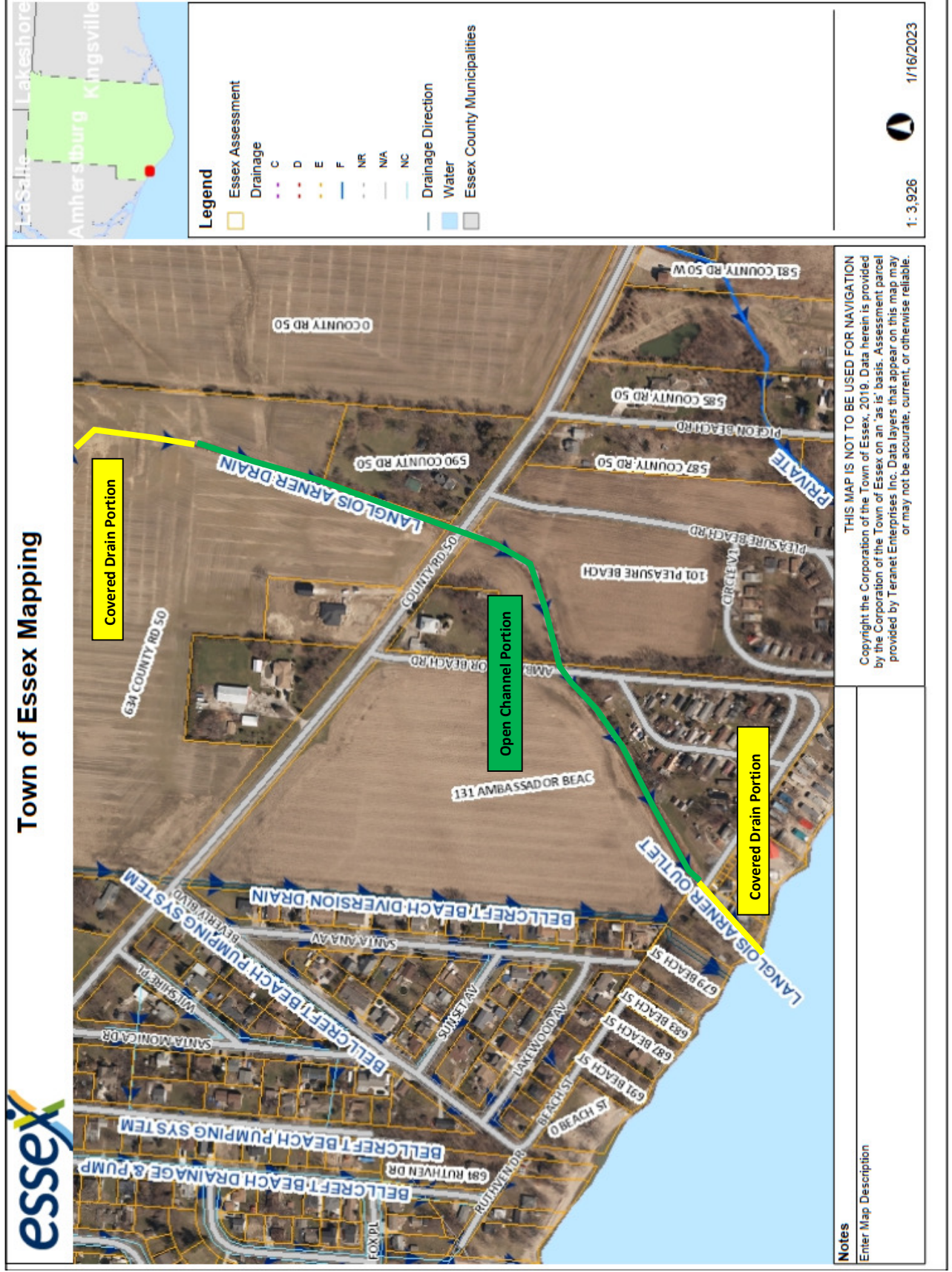
Appendix 'A' - Figure 1
Key Plan



Appendix 'A' - Figure 2
 Site Location



Appendix 'A' - Figure 3
 Existing Drain Configuration



APPENDIX "B"

Picture #1

Approx. Photo Location Coordinates:	Lat: 42.01201° N Lon: 82.98301° W
Description:	Looking west of Ambassador Beach Road looking downstream in a southwesterly direction towards the outlet. Image depicts the existing open channel.
Date of Photo:	February 14, 2023



Picture #2

Approx. Photo Location Coordinates:	Lat: 42.01139° N Long: 82.98442° W
Description:	Looking downstream in a southwesterly direction towards the closed portion of the Langlois Arner Drain leading to the Outlet. Image depict the existing open drain and headwall where the drain is enclosed to the outlet
Date of Photo:	March 8, 2022



Search...

Sign out



Picture #3

Approx. Photo Location Coordinates:	Lat: 42.01120° N Long: 82.98490° W
Description:	Looking upstream in a northeasterly direction towards County Road 50. Image depicts the existing open channel.
Date of Photo:	February 14, 2023



Picture #4

Approx. Photo Location Coordinates:	Lat: 42.01070° N Long: 82.98557° W
Description:	Looking southwest at the existing outlet structure to Lake Erie. Image depicts the existing outlet and v-wall.
Date of Photo:	February 14, 2023

essex

Search...



Sign out



APPENDIX "C"

HABITAT ASSESSMENT & SPECIES AT RISK REVIEW

SUMMARY OF FINDINGS

<p>1. D.F.O. Aquatic Species at Risk and Drain Classification <i>URL: dfo-mpo.gc.ca/species-especies/sara-lep/map-carte/index-eng.html</i></p> <p>Results/Findings: Aquatic Species at Risk</p> <ul style="list-style-type: none"> • Silver Chub (Endangered) • Spotted Sucker (Special Concern) • Silver Lamprey (Special Concern) <p>Critical Habitat</p> <ul style="list-style-type: none"> • None <p>Drain Classification</p> <ul style="list-style-type: none"> • Class 'NR' Drain 	<p>2. Natural Heritage Information Centre <i>URL: ioapplications.irc.gov.on.ca/Natural_Heritage/index.html?viewer=Natural_Heritage&locale=en-CA</i></p> <p>Results/Findings: NHIC Station: 17LG3553 identified:</p> <ul style="list-style-type: none"> • Piping Plover (Endangered) • Restricted Species • Restricted Species (Endangered) • American Burying Beetle (Extirpated) <p>NHIC Station: 17LG3552 identified:</p> <ul style="list-style-type: none"> • Eastern Pondmussel (Special Concern) • Piping Plover (Endangered) • Swamp Rose-mallow (Special Concern) • American Burying Beetle (Extirpated) 	<p>3. Inaturalist Community Mapping & Observations <i>URL: inaturalist.org</i></p> <p>Results/Findings: Critical Habitat or Species at Risk Spotted:</p> <ul style="list-style-type: none"> • None
---	--	---

4. Ontario Bird Breeding Atlas

URL: www.birdsontario.org

Results/Findings: Species at Risk birds breeding within square 17TLG35:

- Acadian Flycatcher (Endangered)
- Bald Eagle (Special Concern)
- Bank Swallow (Threatened)
- Barn Swallow (Threatened)
- Black Tern (Special Concern)
- Bobolink (Threatened)
- Chimney Swift (Threatened)
- Common Nighthawk (Special Concern)
- Eastern Meadowlark (Threatened)
- Eastern Wood-Pewee
- King Rail (Endangered)
- Least Bittern (Threatened)
- Red-headed Woodpecker (Endangered)
- Wood Thrush (Special Concern)
- Yellow-breasted Chat (Endangered)

5. eBird

URL: www.ebird.org/about

Results/Findings: Species at Risk birds sighted near proposed site area:

- No sightings within 5km of project site

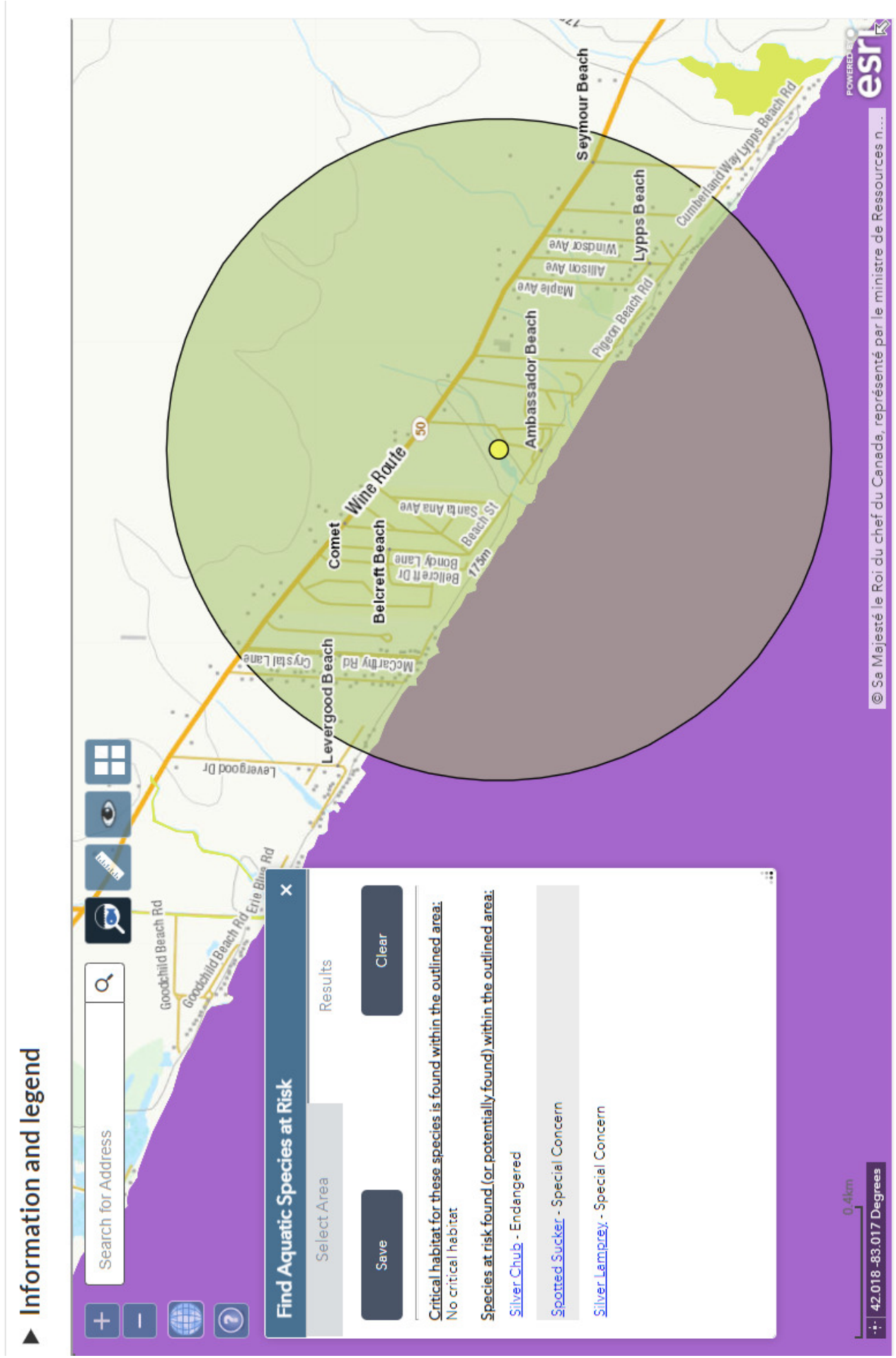
Closest bird sightings

- Colchester Harbor (6km from project site)
- Harrow Sewage Lagoons (10km from project site)
- Harrow Participark Trail (11km from project site)

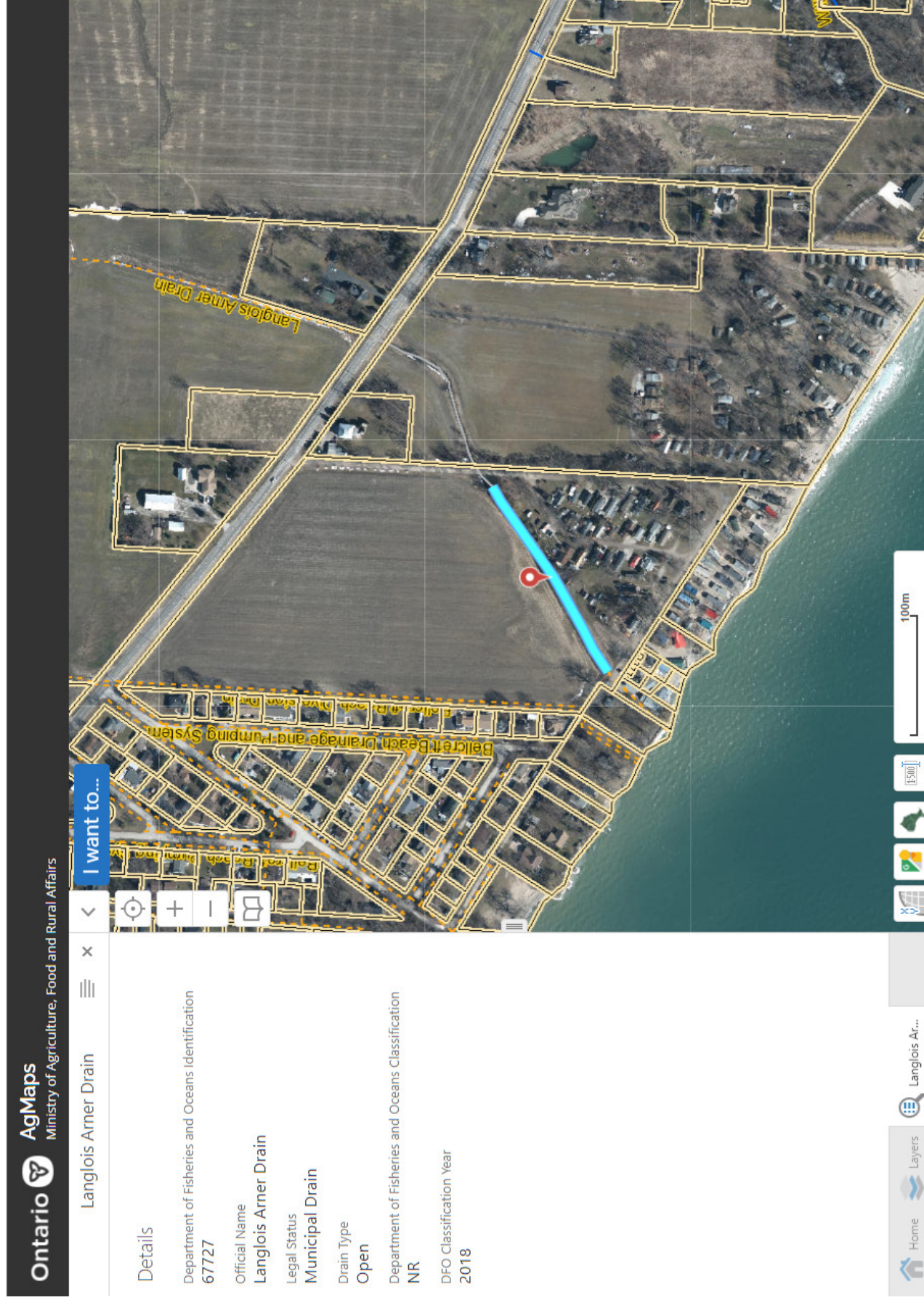
<p>6. Ontario Butterfly Atlas <i>URL: www.ontarioinsects.org/atlas</i></p> <p>Results/Findings: Species at Risk Butterflies recorded within square 17LG35:</p> <ul style="list-style-type: none">• Monarch (Special Concern)
--

<p>7. Ontario Moth Atlas <i>URL: www.ontarioinsects.org/moth/</i></p> <p>Results/Findings: Species at Risk Moths recorded within square 17LG35:</p> <ul style="list-style-type: none">• None
--

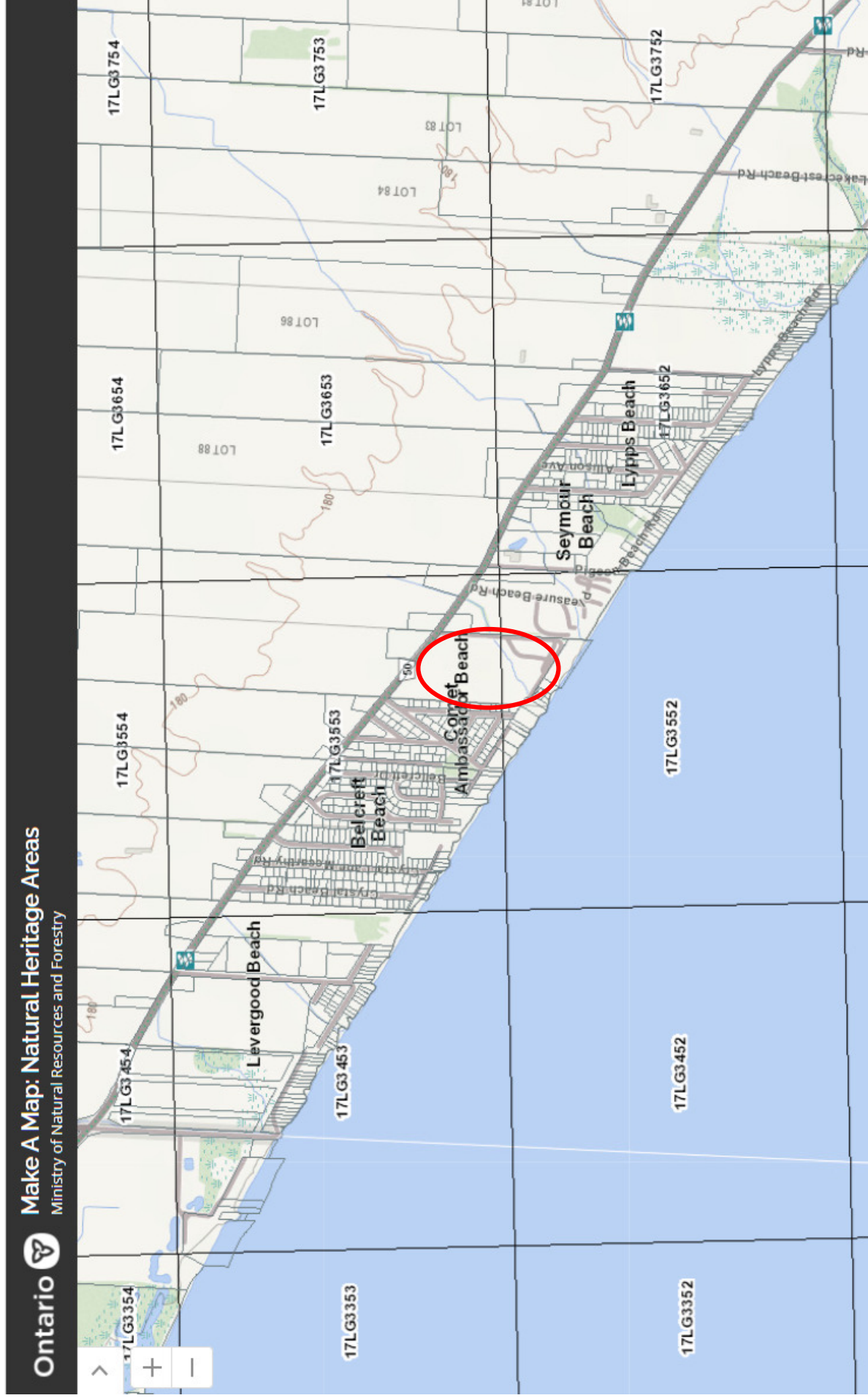
Appendix 'C' - Figure 1
DFO Species At Risk & Critical Habitat



Appendix 'C' - Figure 1.1 DFO Drain Classification



Appendix 'C' - Figure 2
Natural Heritage Information Centre – 17LG3553 & 17LG3552



Appendix 'C' - Figure 2
Natural Heritage Information Centre – Square 17LG3553 & 17LG3552

NHIC SQUARE 17LG3553

NHIC Data

To work further with this data select the content and copy it into your own word or excel documents.

OGF ID	Element Type	Common Name	Scientific Name	SRank SARO Status	COSEWIC Status	ATLAS NAD83 IDENT COMMENTS
690687	SPECIES	Piping Plover	Charadrius melodus	END	END	17LG3553
690687	RESTRICTED SPECIES	Restricted Species	Restricted Species	END	END	17LG3553
690687	RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES	END	END	17LG3553
690687	SPECIES	American Burying Beetle	Nicrophorus americanus	EXP	EXP	17LG3553

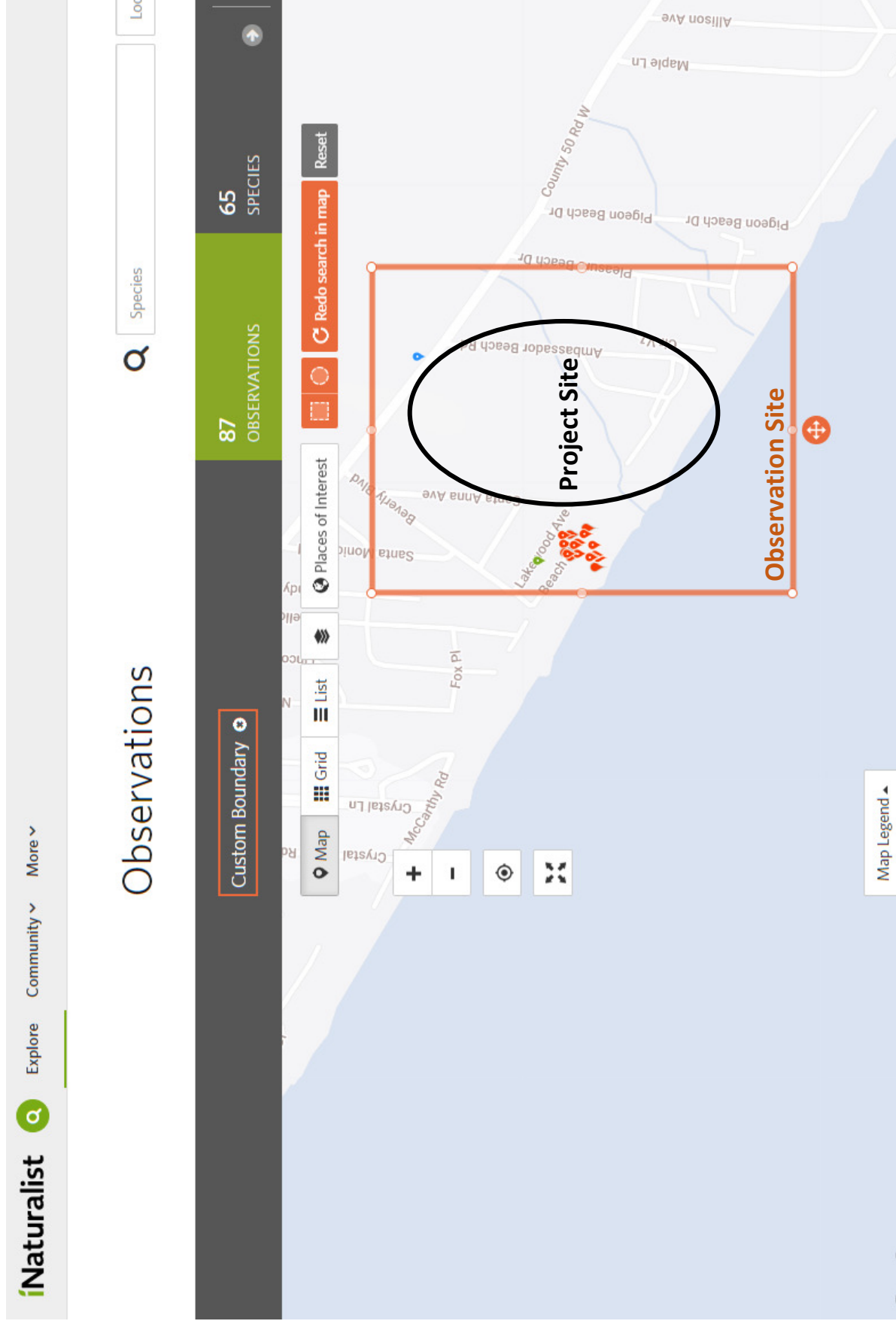
NHIC SQUARE 17LG3552

NHIC Data

To work further with this data select the content and copy it into your own word or excel documents.

OGF ID	Element Type	Common Name	Scientific Name	SRank SARO Status	COSEWIC Status	ATLAS NAD83 IDENT COMMENTS
690686	SPECIES	Eastern Pondmussel	Ligumia nasuta	END	SC	17LG3552
690686	SPECIES	Piping Plover	Charadrius melodus	END	END	17LG3552
690686	SPECIES	Swamp Rose-mallow	Hibiscus moscheutos	SC	SC	17LG3552
690686	SPECIES	American Burying Beetle	Nicrophorus americanus	EXP	EXP	17LG3552

Appendix 'C' - Figure 3
iNaturalist Community Mapping & Observations – Observation Site







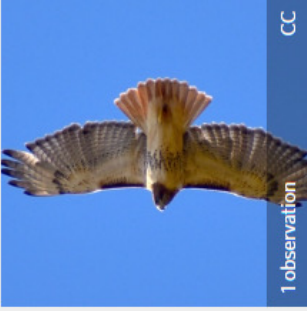





Appendix 'C' - Figure 3
INaturalist Community Mapping & Observations – Species Data

Observations

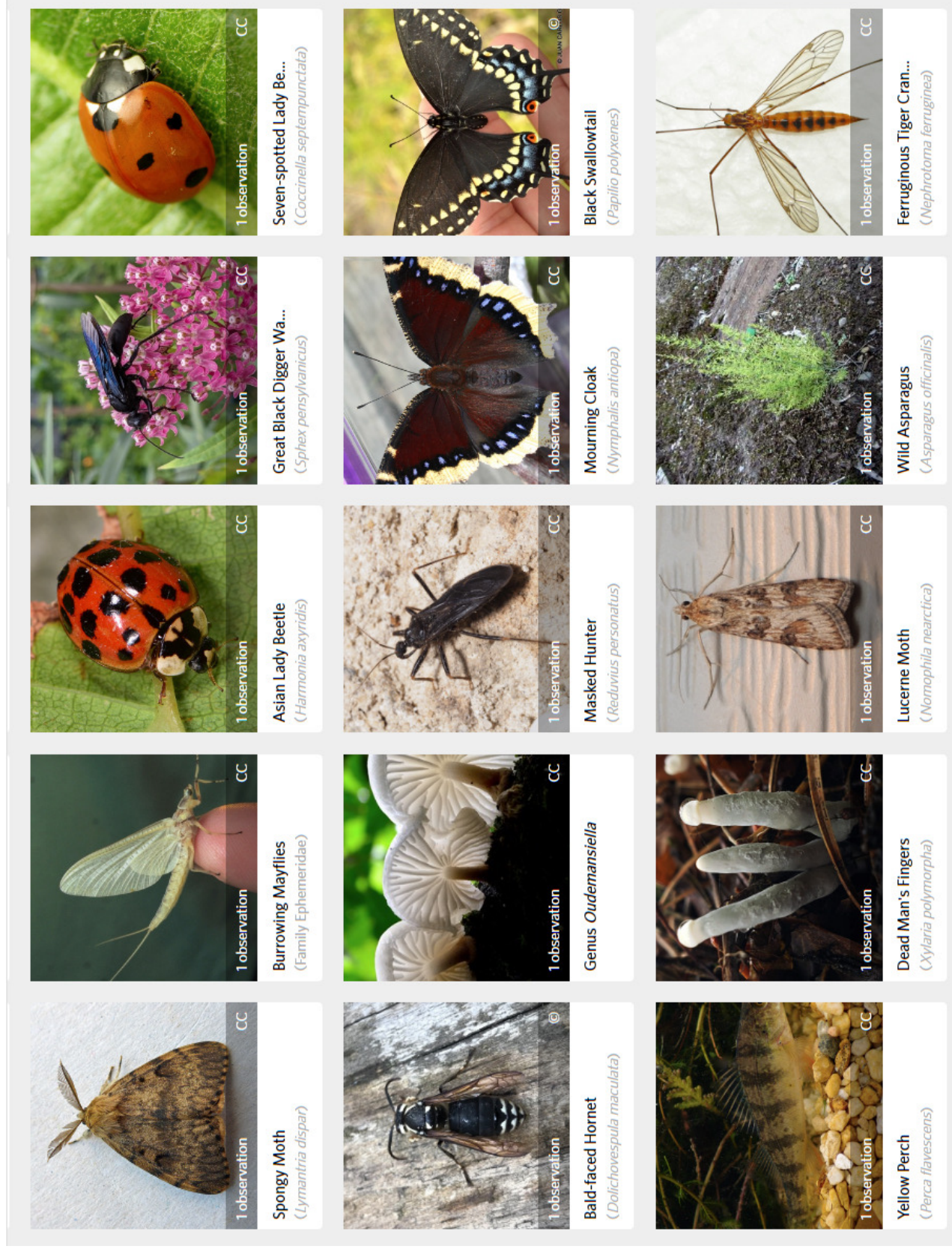
Species Location

87 OBSERVATIONS 65 SPECIES 54 IDENTIFIERS 3 OBSERVERS

 <p>5 observations CC0</p>	 <p>3 observations CC</p>	 <p>2 observations CC</p>	 <p>2 observations CC</p>	 <p>2 observations ©</p>
 <p>2 observations CC</p>	 <p>1 observation CC</p>	 <p>1 observation CC</p>	 <p>1 observation CC</p>	 <p>1 observation CC</p>
<p>Furrow Orbweaver (<i>Larinioides cornutus</i>)</p>	<p>Oak Bush-Cricket (<i>Mecanema thalassinum</i>)</p>	<p>White Perch (<i>Morone americana</i>)</p>	<p>Ailanthus Webworm ... (<i>Atteva aurea</i>)</p>	<p>Eastern Parson Spider (<i>Herpyllus ecclesiasticus</i>)</p>
<p>Rustic Borer (<i>Xylotrechus colonus</i>)</p>	<p>Red-tailed Hawk (<i>Buteo jamaicensis</i>)</p>	<p>Common Garter Snake (<i>Thamnophis sirtalis</i>)</p>	<p>Western Honey Bee (<i>Apis mellifera</i>)</p>	<p>Stretch Spiders (Genus <i>Tetragnatha</i>)</p>


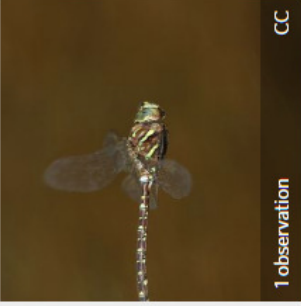






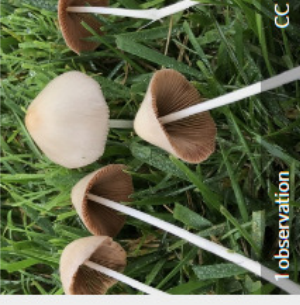





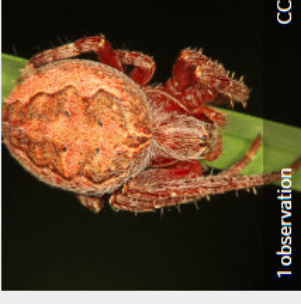
Appendix 'C' - Figure 3

INaturalist Community Mapping & Observations – Species Data Continued



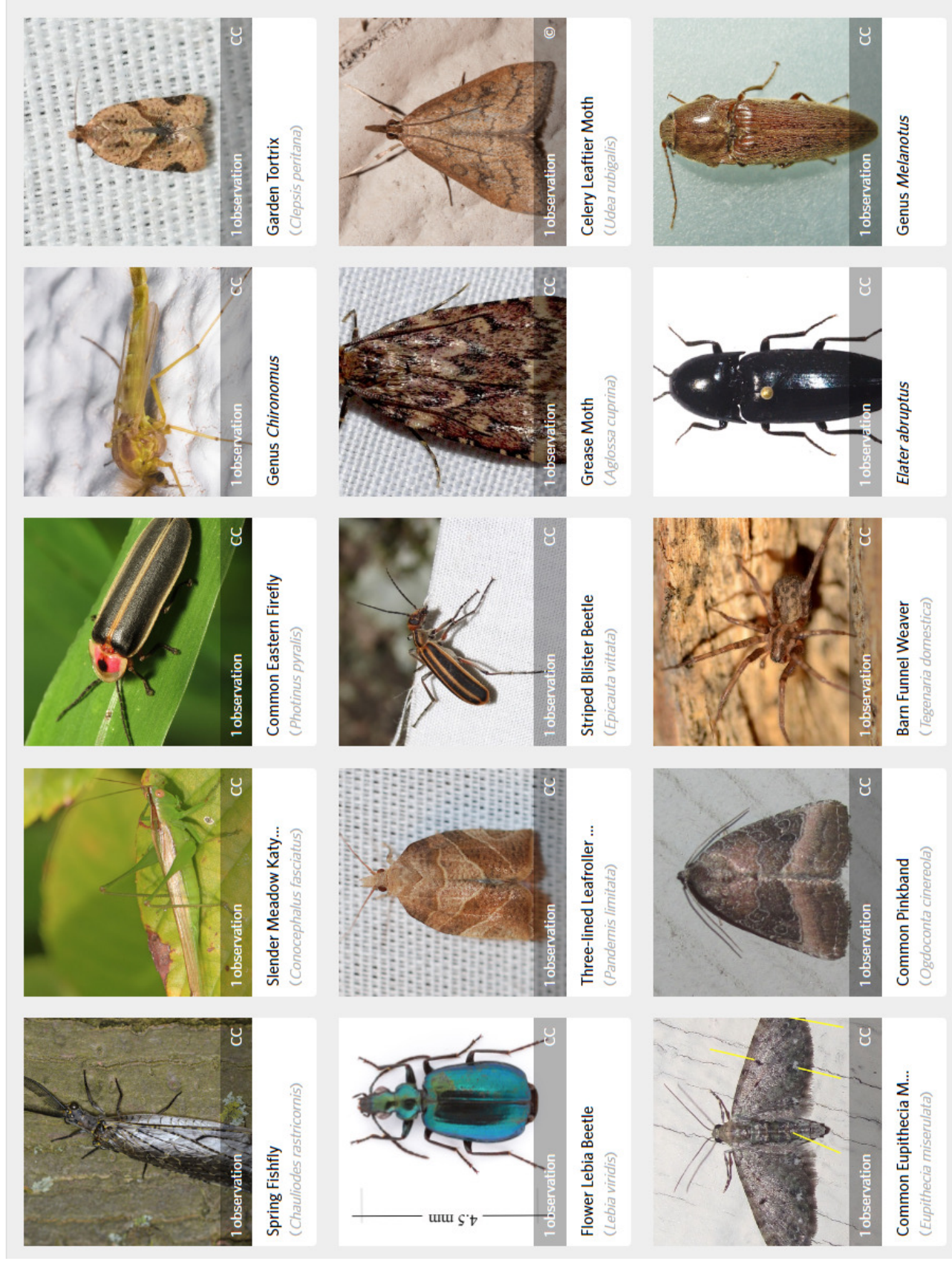
Appendix 'C' - Figure 3

INaturalist Community Mapping & Observations – Species Data Continued

				
1 observation CC American Toad (<i>Anaxyrus americanus</i>)	1 observation CC Shadow Darner (<i>Aeshna umbrosa</i>)	1 observation CC Genus <i>Lasius</i>	1 observation CC White-marked Tussock... (<i>Orgyia leucostigma</i>)	1 observation CC Large Yellow Underwing (<i>Noctua pronuba</i>)
				
1 observation CC Genus <i>Hypena</i>	1 observation CC Lunate Zale Moth (<i>Zale lunata</i>)	1 observation CC Long-horned Caddisflies (Family Leptoceridae)	1 observation CC Milky Conecap (<i>Conocybe alpala</i>)	1 observation CC Chickweed Geometer ... (<i>Haematopis gratiana</i>)
				
1 observation CC Genus <i>Neurocolpus</i>	1 observation CC Banded Tussock Moth (<i>Halysidota tessellaris</i>)	1 observation CC White-speck Moth (<i>Mythimna unipuncta</i>)	1 observation CC Subfamily Pyraustinae	1 observation CC Ornamental Orbweaver (<i>Larinioides patagiatus</i>)

Appendix 'C' - Figure 3

INaturalist Community Mapping & Observations – Species Data Continued



Appendix 'C' - Figure 3
INaturalist Community Mapping & Observations – Species Data Continued



1 observation

CC

Genus *Limonia*



1 observation

CC

Canadian Petrophila
(*Petrophila canadensis*)



1 observation

CC

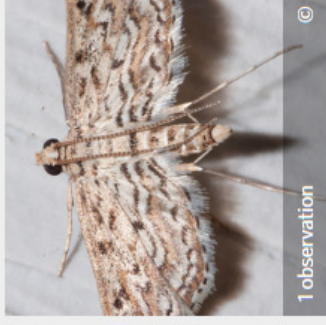
Cryptocephalus leuco...



1 observation

CC

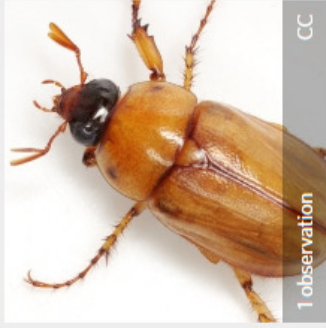
Narrow-winged Tree C...
(*Oecanthus niveus*)



1 observation

©

Watermilfoil Leafcutte...
(*Paraponyx allionealis*)



1 observation

CC

Southern Masked Chaf...
(*Cyclocephala lurida*)



1 observation

CC

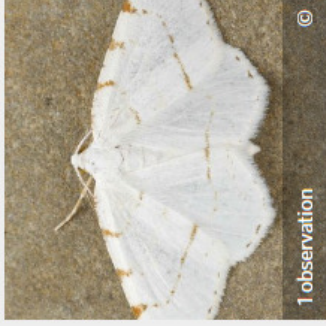
Waterlily Borer Moth
(*Elophila gyralis*)



1 observation

CC

False Mealworm Beetle
(*Alobates pennsylvanicus*)



1 observation

©

Lesser Maple Spanwor...
(*Macaria pustularia*)



1 observation

CC

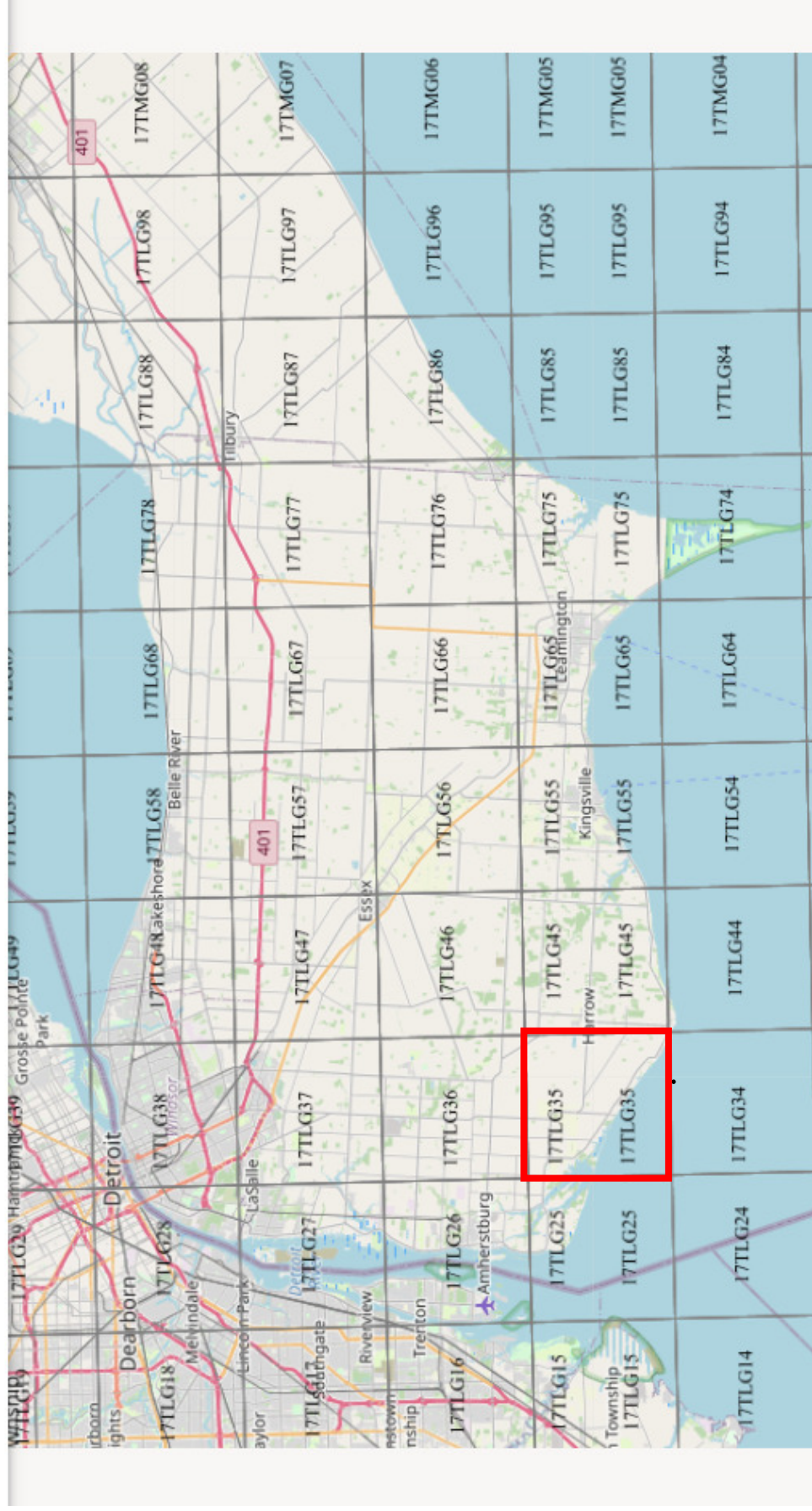
Pale Brittlestem
(*Candolleomyces candolleanus*)

Appendix 'C' - Figure 4
Ontario Breeding Bird Atlas – Square 17TLG35



ONTARIO BREEDING BIRD ATLAS

SUBMIT EXPLORE MY DATA ABOUT



Appendix 'C' - Figure 4

Ontario Breeding Bird Atlas – Square 17TLG35 – Species Data



Square Summary (17TLG35) [\[change\]](#)

	#species				#hours		#pc done	
	poss	prob	conf	total	total	peak	road	offrd
Curr.	23	22	45	90	64.8	30.5	0	1
Prev.	22	28	53	103	84.2	—	3	

Region summary (#1: Essex, ON)

#squares	#sq with data	#species	#squares (pc)	
			target	compl.
38	32	132	38	5
38	38	151	0	23

Target number of point counts in this square: 25 in total: 25 road side, 0 off road.

SPECIES	Prev.	Code	%	SPECIES	Prev.	Code	%	SPECIES	Prev.	Code	%
Canada Goose	FY	NE	78	Killdeer §	FY	FY	90	Red-bellied Woodpecker	T	AE	71
Mute Swan	FY	NE	31	American Woodcock	D		28	Downy Woodpecker	CF	FY	87
Trumpeter Swan ‡			9	Wilson's Snipe ‡			0	Hairy Woodpecker	T	NY	34
Wood Duck	FY	AE	59	Wilson's Phalarope †		NE	3	Northern Flicker	NU	V	78
Blue-winged Teal §	P	FY	12	Spotted Sandpiper	FY	FY	65	American Kestrel §	T	NY	21
Northern Shoveler ‡	P		3	Ring-billed Gull §		NB	6	Merlin ‡			0
Gadwall ‡	H	H	3	Herring Gull §			3	Peregrine Falcon ‡			0
American Wigeon ‡	H	H	3	Caspian Tern ‡			0	Eastern Wood-Pewee §	AE	M	78
Mallard	FY	FY	78	Black Tern †	H		3	Acadian Flycatcher †			9
American Black Duck ‡			3	Common Tern § ‡	H		0	Alder Flycatcher ‡			0
Northern Pintail ‡			0	Forster's Tern †	H		0	Willow Flycatcher	T	P	59
Green-winged Teal ‡	P	H	6	Double-crested Cormorant §	H		21	Least Flycatcher ‡			9
Redhead †	H		3	American White Pelican †			0	Eastern Phoebe	NY	NY	40
Hooded Merganser ‡		H	12	American Bittern ‡		H	9	Great Crested Flycatcher	AE	CF	68
Ruddy Duck ‡	H	H	3	Least Bittern †	H		18	Eastern Kingbird	P	A	84
Wild Turkey	H	FY	56	Great Blue Heron §	H		15	White-eyed Vireo †		T	6
Ring-necked Pheasant ‡			12	Great Egret †	H		0	Yellow-throated Vireo	S	T	9
Pied-billed Grebe	FY	T	15	Green Heron §	T	T	50	Warbling Vireo	CF	T	84
Rock Pigeon (Feral Pigeon)	FY		43	Black-crowned Night-Heron †			9	Red-eyed Vireo	A	M	81
Mourning Dove	AE	FY	93	Turkey Vulture	T	H	56	Blue Jay	FY	A	84
Yellow-billed Cuckoo	S	S	56	Osprey		NY	34	American Crow	T	H	46
Black-billed Cuckoo		S	28	Northern Harrier	CF		6	Black-capped Chickadee	P	FY	75
Common Nighthawk §			12	Sharp-shinned Hawk ‡			0	Tufted Titmouse			31
Chuck-will's-widow †			0	Cooper's Hawk	CF	AE	40	Horned Lark §	FY	CF	56
Eastern Whip-poor-will ‡			0	Bald Eagle §	NY	D	53	Northern Rough-winged Swallow	FY	H	37
Chimney Swift §	D	H	56	Broad-winged Hawk ‡			0	Purple Martin §	NY	AE	75
Ruby-throated Hummingbird	B	NB	62	Red-tailed Hawk	NY	FY	71	Tree Swallow	NY	AE	93
King Rail †	S		3	Eastern Screech-Owl	FY	S	37	Bank Swallow §	H	S	34
Virginia Rail	T		9	Great Horned Owl	FY		53	Barn Swallow §	AE	NY	87
Sora	S		9	Long-eared Owl ‡	H		0	Cliff Swallow §	H	AE	65
Common Gallinule §	FY	FY	12	Short-eared Owl †			0	White-breasted Nuthatch		A	65
American Coot ‡	FY		6	Belted Kingfisher	T	AE	53	Brown Creeper			0
Sandhill Crane			12	Red-headed Woodpecker †	CF	S	21	Blue-gray Gnatcatcher		CF	46

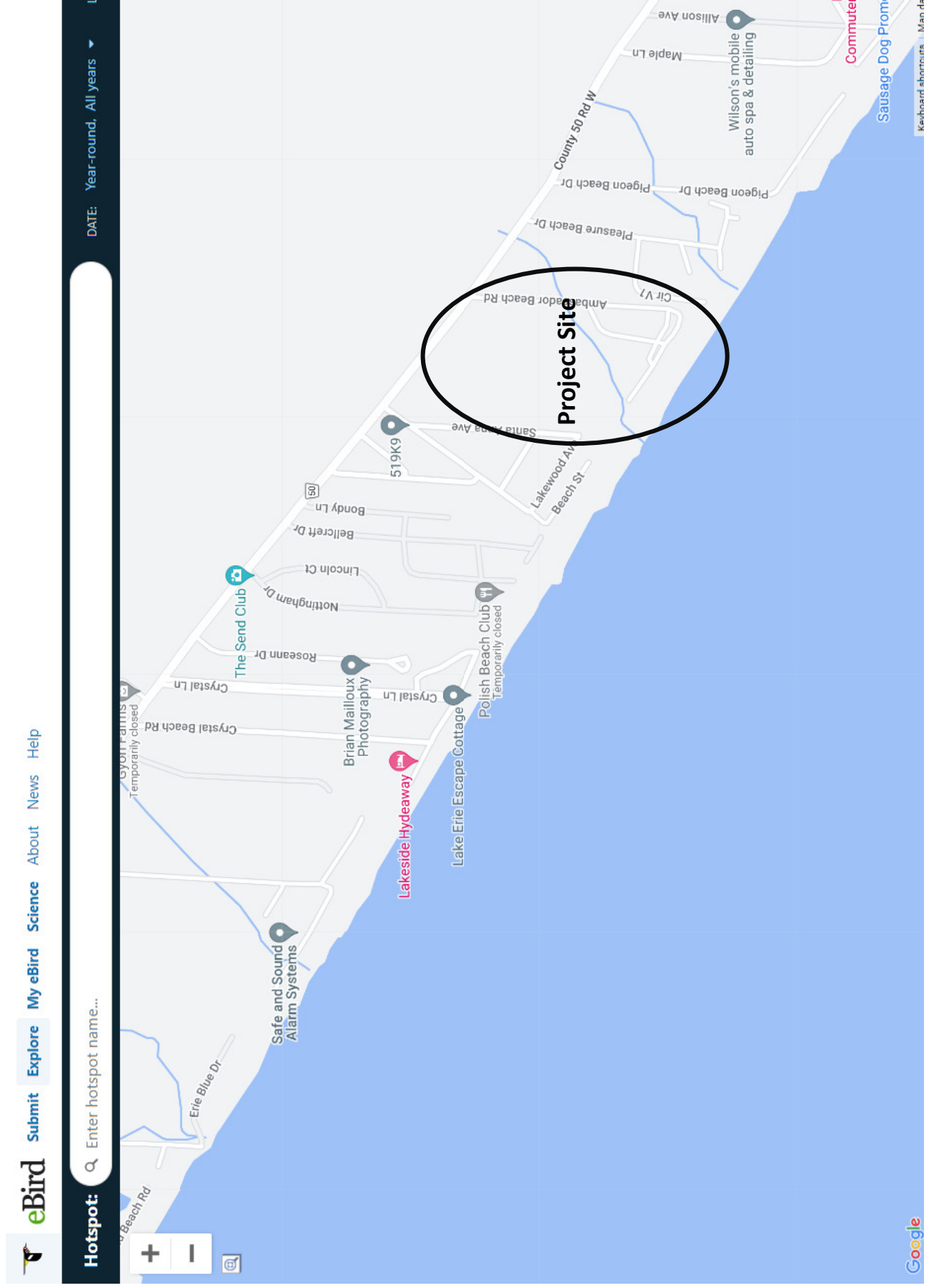
Appendix 'C' - Figure 6

Ontario Breeding Bird Atlas – Square 17TLG35 – Species Data Continued

Breeding Bird Atlas - Summary Sheet for Square 17TLG35 (page 2 of 2)

SPECIES	Prev.	Code	%	SPECIES	Prev.	Code	%
House Wren	AE	AE	90	Brewer's Blackbird §			0
Sedge Wren ‡			0	Common Grackle	FY	CF	96
Marsh Wren	T	S	21	Ovenbird			0
Carolina Wren	NU	A	78	Blue-winged Warbler			3
European Starling	CF	CF	90	Prothonotary Warbler †	NE	AE	18
Gray Catbird	NE	T	75	Mourning Warbler ‡	S		3
Brown Thrasher	NE	T	46	Common Yellowthroat	CF	A	62
Northern Mockingbird			3	Hooded Warbler ‡			3
Eastern Bluebird	H	H	31	American Redstart	T		21
Veery ‡			0	Cerulean Warbler †			0
Wood Thrush §	CF	FY	34	Yellow Warbler	NE	AE	87
American Robin	NY	NY	96	Chestnut-sided Warbler ‡			0
Cedar Waxwing	FY	FY	81	Pine Warbler ‡			3
House Sparrow	FY	AE	87	Scarlet Tanager			6
House Finch	P	T	75	Northern Cardinal	FY	NB	90
American Goldfinch	FY	T	87	Rose-breasted Grosbeak	N	S	56
Grasshopper Sparrow ‡			0	Indigo Bunting	FY	S	81
Chipping Sparrow	FY	FY	87	Dickcissel †		FY	37
Field Sparrow §	T	S	46				
White-throated Sparrow ‡	T		0				
Vesper Sparrow	A	S	50				
Savannah Sparrow	D	T	62				
Song Sparrow	NY	CF	81				
Swamp Sparrow	T	S	18				
Eastern Towhee §		T	28				
Yellow-breasted Chat †	AE		9				
Yellow-headed Blackbird †			0				
Bobolink §	T	H	37				
Eastern Meadowlark §	S		25				
Orchard Oriole	P		40				
Baltimore Oriole	CF	CF	90				
Red-winged Blackbird	NY	CF	96				
Brown-headed Cowbird	NE	T	96				

Appendix 'C' - Figure 5
eBird Mapping



Appendix 'C' - Figure 6
Ontario Butterfly Atlas – Square 17LG35



Appendix 'C' - Figure 6

Ontario Butterfly Atlas – Square 17LG35 – Species Data



Species list in taxonomic order for square
17LG35

All species

Number of rows of data displayed below: 51.

Species #	Common Name	Scientific Name	# of Records	Earliest in Yr (adults)	Latest in Yr (adults)	Earliest Yr	Latest Yr
1	Silver-spotted Skipper	<i>Epargyreus clarus</i>	13	May 14	Sep 6	1999	2021
10	Horace's Duskywing	<i>Erynnis horatius</i>	1	Jul 18	Jul 18	2021	2021
13	Funereal Duskywing	<i>Erynnis funeralis</i>	1	Sep 12	Sep 12	2015	2015
15	Wild Indigo Duskywing	<i>Erynnis baptisiae</i>	5	Aug 22	Sep 13	2015	2021
19	Common Checkered Skipper	<i>Pyrgus communis</i>	3	Sep 7	Sep 12	2012	2018
20	Common Sootywing	<i>Pholisora catullus</i>	6	Aug 2	Aug 30	1999	2021
23	Least Skipper	<i>Ancyloxypha numitor</i>	31	Jun 26	Sep 23	1998	2021
25	European Skipper	<i>Thymelicus lineola</i>	1	Jul 15	Jul 15	1980	1980
26	Fiery Skipper	<i>Hylephila phyleus</i>	13	Aug 10	Sep 18	1998	2019
30	Peck's Skipper	<i>Polites peckius</i>	2	May 29	Aug 8	1989	2020
37	Sachem	<i>Atalopedes campestris</i>	3	Aug 29	Nov 1	1999	1999
42	Broad-winged Skipper	<i>Poanes viator</i>	2	Jul 27	Aug 1	2016	2016
47	Dun Skipper	<i>Euphyes vestris</i>	1	Jul 15	Jul 15	1980	1980
53	Pipevine Swallowtail	<i>Battus philenor</i>	1	Jul 21	Jul 21	2013	2013
55	Black Swallowtail	<i>Papilio polyxenes</i>	16	Jun 3	Sep 15	1999	2018
57	Eastern Giant Swallowtail	<i>Papilio cresphontes</i>	15	Jun 10	Sep 15	1998	2018
58	Eastern Tiger Swallowtail	<i>Papilio glaucus</i>	12	May 20	Sep 7	1999	2018
59.1	Tiger Swallowtail Complex	<i>Papilio glaucus complex</i>	2	Jul 19	Aug 8	2020	2020
60	Spicebush Swallowtail	<i>Papilio troilus</i>	3	May 2	Oct 21	2000	2021
65	Cabbage White	<i>Pieris rapae</i>	47	Jun 19	Nov 6	1983	2021
69	Clouded Sulphur	<i>Colias philodice</i>	30	May 12	Nov 6	1980	2021

Appendix 'C' - Figure 6

Ontario Butterfly Atlas – Square 17LG35 – Species Data Continued

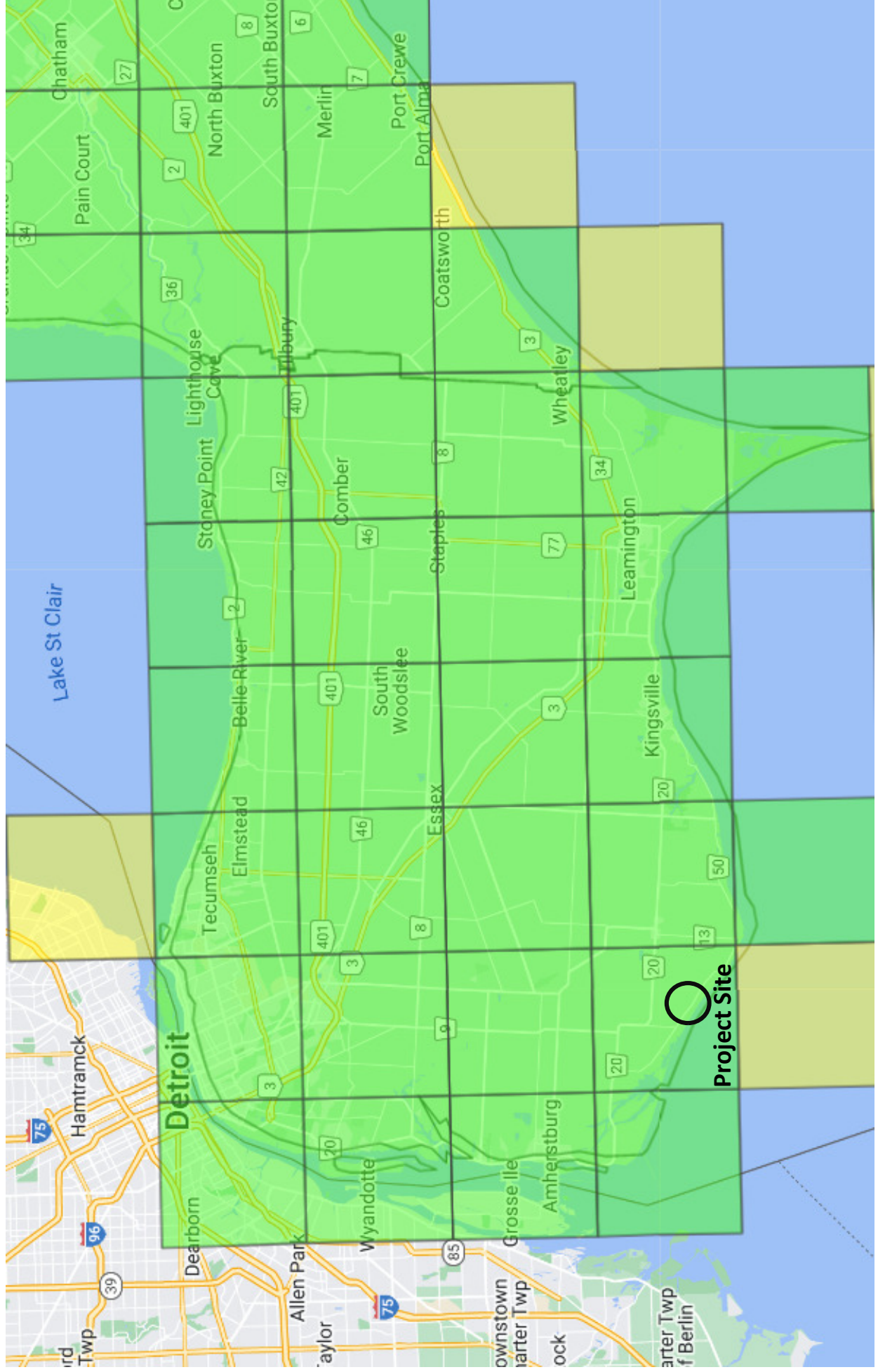
Species list in taxonomic order for square
17LG35

All species



69	Clouded Sulphur	<i>Colias philodice</i>	30	May 12	Nov 6	1980	2021
70	Orange Sulphur	<i>Colias eurytheme</i>	24	May 12	Nov 11	1983	2021
78	Little Yellow	<i>Pyrisitia lisa</i>	1	Sep 17	Sep 17	2019	2019
84	Bronze Copper	<i>Lycaena hyllus</i>	16	May 30	Oct 21	1998	2021
104	Gray Hairstreak	<i>Strymon melinus</i>	2	Aug 29	Sep 7	1999	2012
107	Eastern Tailed Blue	<i>Cupido comyntas</i>	7	Aug 4	Sep 13	1999	2020
110	Summer Azure	<i>Celastrina neglecta</i>	5	Jun 9	Jul 24	2020	2021
111	Azure sp.	<i>Celastrina sp.</i>	20	Apr 17	Aug 23	2013	2018
117	American Snout	<i>Libytheana carinenta</i>	5	Aug 1	Oct 21	1999	2019
118	Variiegated Fritillary	<i>Euptoieta claudia</i>	2	Sep 27	Oct 19	2016	2018
120	Aphrodite Fritillary	<i>Speyeria aphrodite</i>	1	Jul 15	Jul 15	1980	1980
121	Regal Fritillary	<i>Speyeria idalia</i>	1	Oct 2	Oct 2	2000	2000
125	Meadow Fritillary	<i>Boloria bellona</i>	1	Sep 13	Sep 13	1999	1999
132	Pearl Crescent	<i>Phyciodes tharos</i>	2	Aug 21	Aug 24	2020	2021
133	Northern Crescent	<i>Phyciodes cocyta</i>	8	Jun 9	Oct 9	2002	2021
136	Question Mark	<i>Polygonia interrogationis</i>	11	Jul 27	Oct 21	1965	2018
137	Eastern Comma	<i>Polygonia comma</i>	26	Apr 13	Dec 16	2000	2021
141	Gray Comma	<i>Polygonia progne</i>	2	Sep 29	Oct 8	2017	2018
142	Compton Tortoiseshell	<i>Nymphalis l-album</i>	1	Sep 9	Sep 9	2016	2016
143	Mourning Cloak	<i>Nymphalis antiopa</i>	9	Apr 18	Nov 3	1979	2021
144	Milbert's Tortoiseshell	<i>Aglais milberti</i>	2	Apr 17	Sep 13	1977	1999
145	American Lady	<i>Vanessa virginiensis</i>	5	Apr 12	Aug 30	2013	2021
146	Painted Lady	<i>Vanessa cardui</i>	8	Jul 30	Oct 21	2007	2018
147	Red Admiral	<i>Vanessa atalanta</i>	26	Apr 13	Oct 21	2007	2021
148	Common Buckeye	<i>Junonia coenia</i>	13	Aug 23	Nov 11	1999	2019
150	Red-spotted Purple	<i>Limenitis arthemis astyanax</i>	9	Jul 19	Aug 23	2013	2020
151	Viceroy	<i>Limenitis archippus</i>	18	Jul 19	Oct 21	1983	2018
152	Hackberry Emperor	<i>Asterocampa celtis</i>	13	Jul 3	Aug 30	1980	2021
153	Tawny Emperor	<i>Asterocampa clyton</i>	4	Jul 15	Sep 5	1989	2016
159	Common Wood-Nymph	<i>Cercyonis pegala</i>	1	Aug 20	Aug 20	1983	1983
167	Monarch	<i>Danaus plexippus</i>	59	May 6	Nov 11	1985	2021

Appendix 'C' - Figure 7
Ontario Moth Atlas – Square 17LG35



Appendix 'C' - Figure 7

Ontario Moth Atlas – Square 17LG35 – Species Data



Species list in taxonomic order for square
17LG35

Data for all species

Number of rows of data displayed below: 6.

Species #	Common Name	Scientific Name	# of Records	Earliest in Yr (adults)	Latest in Yr (adults)	Earliest Yr	Latest Yr
890072.00	Luna Moth	<i>Actias luna</i>	1	Aug 9	Aug 9	2015	2015
890082.00	Cecropia Moth	<i>Hyalophora cecropia</i>	1	May 31	May 31	2013	2013
890105.00	Catalpa Sphinx	<i>Ceratomia catalpae</i>	5	Sep 3	Sep 3	2014	2019
930412.00	Milkweed Tussock Moth	<i>Euchaetes egle</i>	1			2003	2003
930812.00	Darling Underwing	<i>Catocala cara</i>	1	Aug 17	Aug 17	2003	2003
930815.00	The Sweetheart	<i>Catocala amatrix</i>	1	Sep 2	Sep 2	2019	2019

[TEA home page](#) | [Main atlas page](#)

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APPENDIX "C"

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Fuerland

REALTY LTD. BROKERAGE

2260 Foster Avenue. Windsor. Ontario N8W 5C9
Phone # (519) 966-0881 Fax# (519) 966-3209

July 29th 2024

THE TOWN OF ESSEX

Re: Langlois-Arner Drain Improvements – D22-147

Attention: Lindsay Dean (Town Drainage Superintendent)

Re: Appraisal of Market Values of Partial Land Takings of
Residential Land and Waterfront Residential Land
Adjacent to the Langlois-Arner Drain and Outlet
Located in the Town of Essex, ON - Applicant: Town of Essex
Our File# FR24-15491

As requested, we have completed an investigation and valuation analysis to estimate the current market value range of vacant residential properties located adjacent to the Langlois-Arner Drain and Outlet, Town of Essex, Ontario as of **June 14th 2024**, the date of our review. The only authorized use of this report is to assist the Town of Essex in their negotiations with the current land owners for the acquisition of partial takings of the properties for the purposes of improving the Langlois-Arner Drain and Outlet to facilitate the development of Parcel Roll #670-03703 within Part Lot 96, Concession 1, south of County Road 50.

The properties involved are of various sizes, however they are primarily residential areas to be acquired for the purposes of improving the Langlois-Arner Drain outlet.

This appraisal report, containing 27 pages plus addenda, is valid only if it bears the original signature of the author(s) and all conclusions are subject to all Terms of Reference, Assumptions and Limiting Conditions contained herein.

Current Market Value of Residential Partial Takings

TWENTY-FIVE DOLLARS PER SQUARE FOOT

\$25.00 per square foot

Current Market Value of Partial Takings Waterfront

TWENTY-SEVEN DOLLARS AND TWENTY-FIVE CENTS PER SQUARE FOOT

\$27.25 per square foot

Respectfully,
FUERLAND REALTY LTD

Don Fuerth B.A., AACI, P. App

Respectfully,
FUERLAND REALTY LTD.

Cara Pazur, B.A., AIC Candidate Member

EXECUTIVE SUMMARY

EFFECTIVE/REVIEW DATE:	June 14 th 2024
INTEREST VALUED	Fee Simple Estate
PURPOSE & AUTHORIZED USE:	The purpose of this appraisal is to provide an estimate the current market value range of residential sites located adjacent to the Langlois-Arner Drain and Outlet, Town of Essex as of June 14th 2024 , the date of our review. The only authorized use of this report is to assist the Town of Essex in their negotiations with the current land owners for the acquisition of partial takings.
ADDRESS OF PROPERTY:	Residential Land Adjacent to the Langlois-Arner Drain and Outlet, Town of Essex, ON, specifically 131 Ambassador Beach Road and 671 Ambassador Beach Road
ROLL NUMBER:	N/A
PIN NUMBER:	N/A
REGISTERED OWNER:	N/A
LEGAL DESCRIPTIONS:	N/A
TYPE OF PROPERTY:	Residential Property
IMPROVEMENTS:	None Considered
LAND AREA:	Various
ZONING:	Residential – R1.1 & R1.6
HIGHEST AND BEST USE:	As Vacant: Residential sites As Improved: N/A
MARKET CONDITIONS	Positive
MARKET EXPOSURE	± 6 to ± 9 Months
VALUE ESTIMATES:	Direct Comparison Approach \$25.00 per square foot Non-Waterfront \$27.25 per square foot Waterfront

NEIGHBOURHOOD

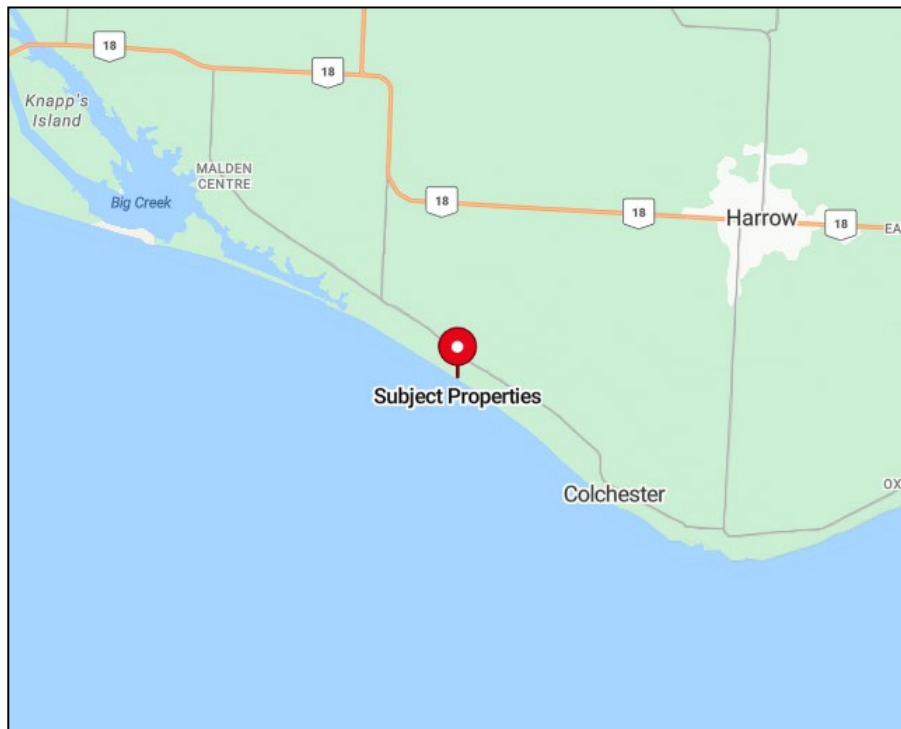
The subject properties are located in the Town of Essex, southwest of the community of Harrow.

In the immediate neighbourhood of the subject properties are similar residential lots, single-family residential dwellings.

No adverse influences have been noted in the area and zoning bylaws are in effect and enforced.

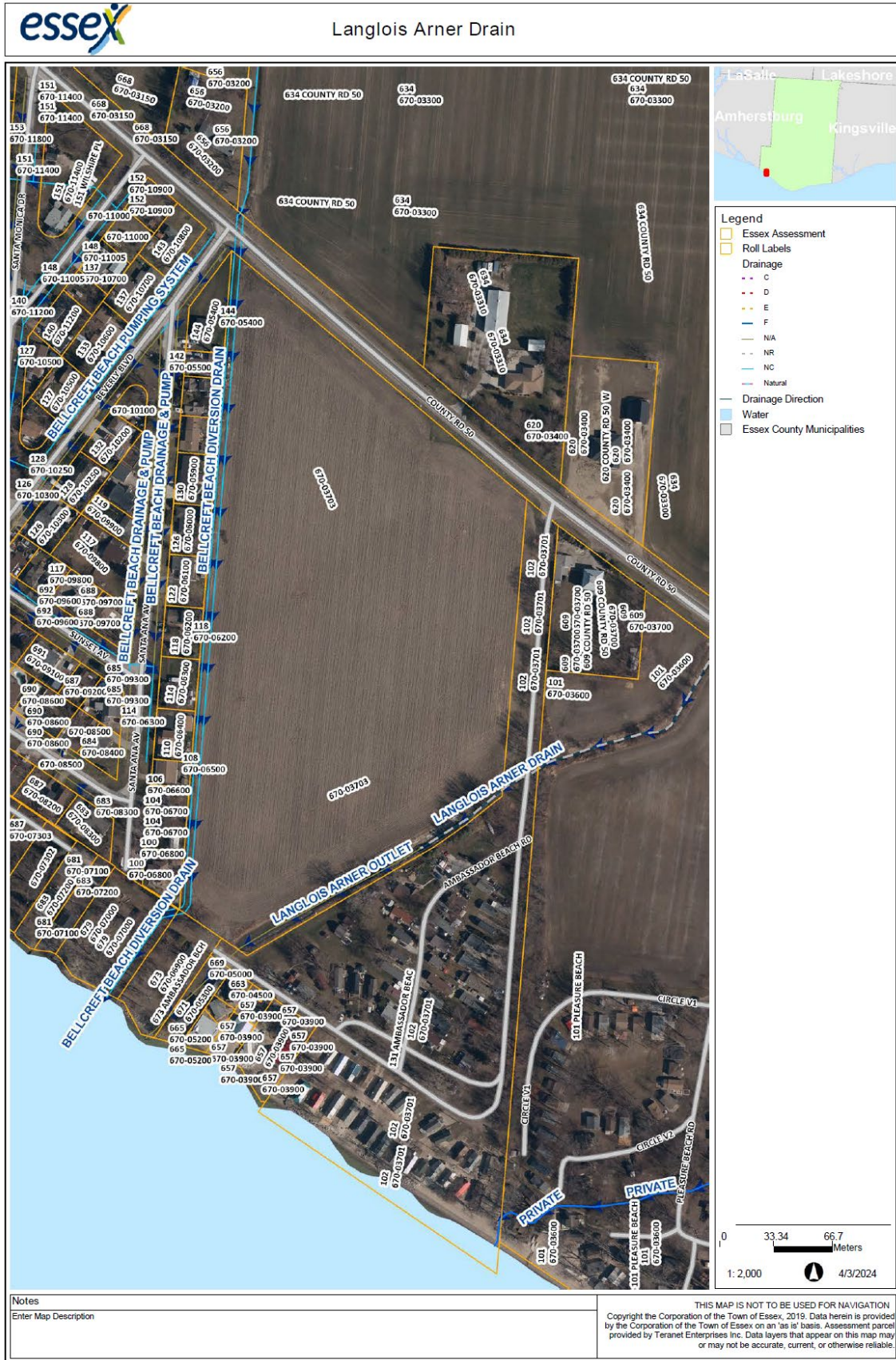
In summary, the subject properties are located in rural waterfront residential neighbourhoods with ready access to all major arteries.

Location Map



Site Descriptions

- i) Location: Rural – Residential
- ii) Dimensions: Irregular
- iii) Area: Various - Total Property source: [MCAP & Geowarehouse Applicant]
- iv) Topography: Basically level.
- v) Services: Typical municipal utilities and services are available.



LAND USE CONTROLS

Land use in the Province of Ontario is regulated by the Planning Act, 1990, Statutes of Ontario, 1990, Chapter 1, as amended, and is administered by the Minister of Municipal Affairs. The Planning Act addressed implementation of the Official plan and the Zoning By-Law.

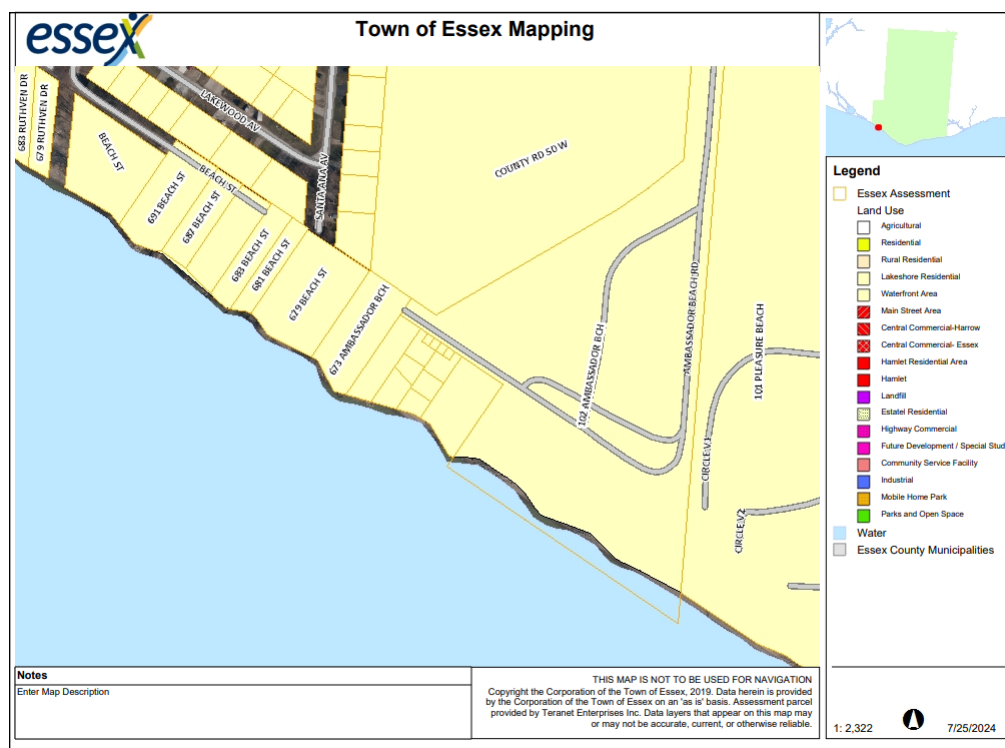
OFFICIAL PLAN

The Planning Act, 1990, as amended, Chapter 1 (h) defines Official Plan: “official plan” means a document approved by the Minister, containing objectives and policies established primarily to provide guidance for the physical development of a municipality or a part thereof an area that is without municipal organization, while having regard to relevant social, economic and environment matters.

The Official Plan for the Municipality of Essex applies to all lands within the corporate limits. The restructured Municipality was incorporated on January 1st, 1999 joining the former Towns of Essex, Harrow and the Townships of Colchester North and South into the Municipality of Essex. The Municipality of Essex has a land area of 28,734 hectares and an estimated 2000 population of 27,000. Geographically, Essex is located in the south west corner of Essex County bordered by the Town of Kingsville to the east, the Town of Lakeshore to the North, the Town of Amherstburg to the west and Lake Erie to the south. In accordance with Section 17 of the Planning Act, R.S.O. 1990 the Council of a municipality may provide for the preparation of a plan suitable for adoption as the Official Plan of the municipality. An official plan is defined in the Planning Act as a document, approved by the Minister, containing objectives and policies established primarily to provide guidance for the physical development of a municipality while having regard to relevant social, economic and environmental matters. Section 24 of the Act further provides that where an Official Plan is in effect no public work shall be undertaken and no by-law passed for any purpose unless it is in conformity with the Official Plan.

The Official Plan for the former Town of Essex designates the subject properties as **Lakeshore Residential**. The subject sites’ current usage is in conformity with the Town of Essex Official Plan.

Official Plan Map



ZONING

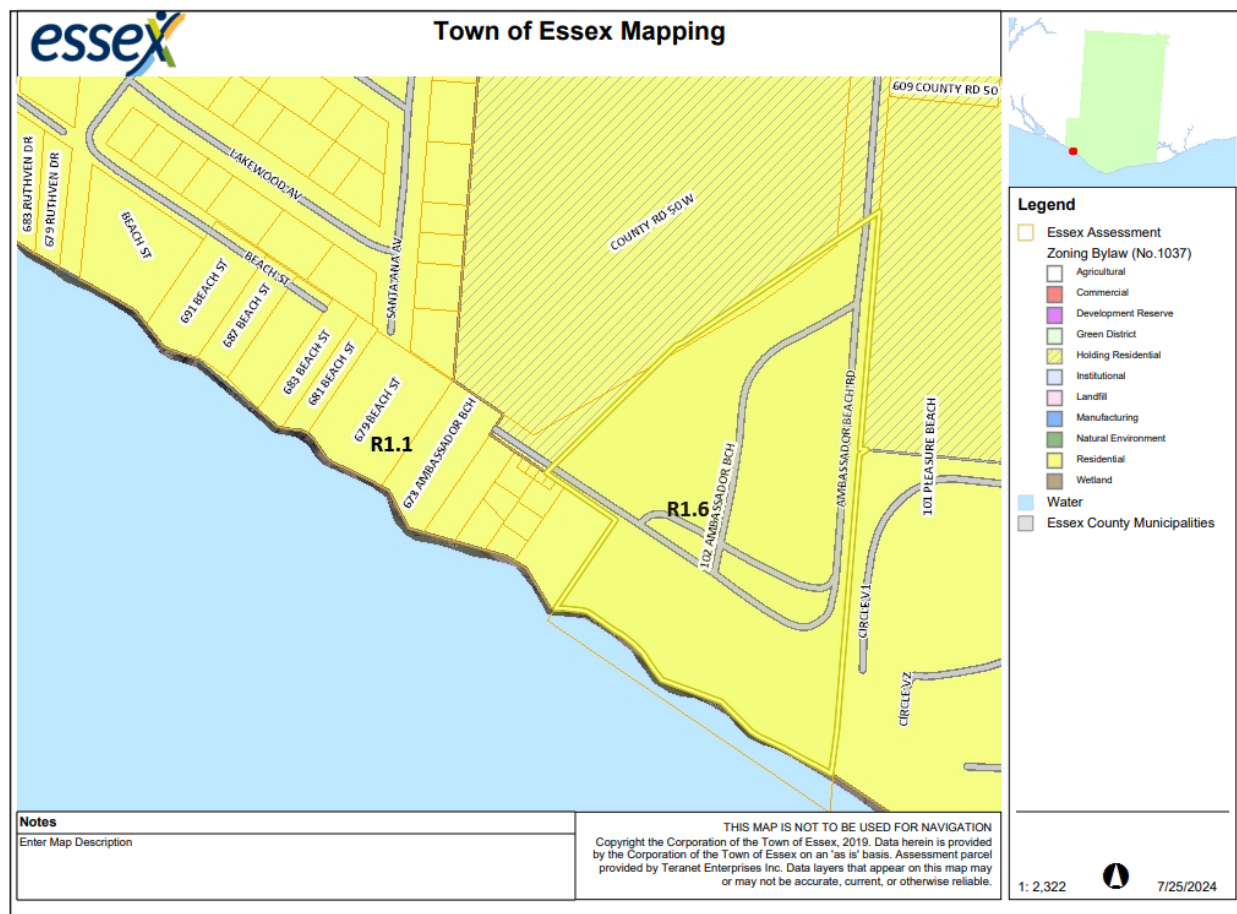
While Official Plans set out the general long-range policy framework for future land use, Zoning By-Laws take precedence and put those objectives of the Official Plan into effect and provide for their day-to-day administration.

Unlike the Official Plan, the Zoning By-Law contains very specific and legally enforceable regulations. Any new development or construction that fails to comply with a municipality’s Zoning By-Law is not permitted and will be denied a building permit.

Zoning By-Laws define zones for various types of uses and establish the specific type of land use in each zone (i.e. residential, commercial, agricultural, institutional, and industrial, etc.). The by-laws will also set standard for erecting buildings (i.e. minimum lot size, frontage, set-backs from streets, side yard clearances, building heights, parking requirements, etc.)

According to the Town of Essex the subject properties zoned as **Residential – R1.1 & R1.6**.

Zoning Map



SECTION 14 - RESIDENTIAL DISTRICTS (R1.)

Subsection 14.1 Residential District 1.1 (R1.1)

Low density housing on urban lots
a) Permitted Uses

i. Main use	Single Unit Dwelling, Two Unit Dwelling, Three Unit Dwelling, or One Bed and Breakfast Dwelling	Semi- Detached Dwelling, or Semi- Detached Dwelling Unit	Lawfully Existing Duplex Dwelling	Lawfully Existing Semi- Detached Dwelling
ii. Accessory use	Any use accessory to the Main Use			
b) Regulations				
i. Lot Width – Minimum	12m (40f)	15m (50f) for a Semi- Detached Dwelling	18m (60f)	21m (70f)
ii. Lot Area – Minimum	360m ² (4000f ²) for a lot serviced by a sanitary sewer 925m ² (10,000f ²) for a lot not serviced by a sanitary sewer	460m ² (5000f ²)	555m ² (6000f ²)	650m ² (7000f ²)
iii. Lot Coverage – Maximum	40% of lot area	50% of lot area	40% of lot area	40% of lot area
iv. Minimum Landscaped Area in a Required Front Yard	30% for a lot having a lot width less than 12m; 40% for a lot of 12m to 15m in lot width; 50% for a lot greater than 15m in lot width.			
v. Building Height – Maximum	10m (32f) for a main building 1 storey for an accessory building			
vi. Front Yard Depth – Minimum	7.5m (25f)			
vii. Rear Yard Depth – Minimum	7.5m			

<p>viii. Side Yard Width – Minimum</p>	<p>1.2m (4f) both sides for an interior side yard where there is an attached garage or carport 1.2m and 3m (10f) for interior side yards (one side/other side) where there is no attached garage or carport 1.2m (4f) for an exterior side yard, except that, where a building wall has a vehicle entrance facing the exterior lot line, the minimum setback from the exterior lot line shall be 6m(20f)</p>
<p>ix. Each dwelling shall have storm water and sanitary facilities and electrical and potable water services approved by the Town or other authority having jurisdiction.</p> <p>x. No accessory building and combination of accessory buildings shall exceed 70m² (750f²) and 92m² (1000f²) respectively.</p> <p>xi. Provisions of the following subsections shall apply in whole or in part to lands situated within any of the following restricted areas shown on the Zoning District Maps:</p> <ol style="list-style-type: none"> 1. Floodplain Development Control Area – see subsection 10.6 2. Lake Erie Flood Prone Area – see subsection 10.6 <p>7: c) Supplementary Regulations: See Definitions 10: Supplementary Building Regulations</p> <p>8: Supplementary Use Regulations 11: Parking Space Regulations</p> <p>9: Supplementary Lot Regulations 12: Parking Area Regulations.</p>	

Subsection 14.6 Residential District 1.6 (R1.6)

Klies Beach/Ambassador Beach	
a) Permitted Uses	
i. Main use	A lawfully existing Single Unit Dwelling
ii. Accessory use	Any use accessory to the main use
b) Regulations	
iii. Lot Coverage – Maximum	As lawfully existing, except that one detached accessory building may be constructed for each dwelling, provided that it has a maximum floor area of 9.3m ² (100fs), a maximum height of 2.7m (8.8f) and it shall be separated from a dwelling a minimum of 2m (6.6f)
iv. Building Height – Maximum	As lawfully existing
v. Separation from abutting dwellings – Minimum	As lawfully existing
vi. Separation from existing lot lines -Minimum	As lawfully existing
vii. Each dwelling shall be maintained and used exclusively as a three season cottage, for spring, summer and fall occupancy and not modified or converted to permit winter occupancy.	
viii. No piped water, sanitary facilities or electrical power shall be provided to an accessory building.	
ix. Provisions of the following subsections shall apply in whole or in part to lands situated within any of the following restricted areas shown on the Zoning District Maps:	
1. Floodplain Development Control Area – see subsection 10.6	
2. Lake Erie Flood Prone Area – see subsection 10.6	
c) Supplementary Regulations: See Sections	

HIGHEST AND BEST USE

The term “Highest and Best Use” is generally considered in appraisal terminology as the most profitable likely use to which a property can be put which will result in the greatest net return over a given period of time. For an asset to have value, it must be capable of providing some form of beneficial utility or enjoyment to the owner or user. An examination of the highest and best use or most probable use is, therefore, critical to the appraisal process.

The Highest and Best Use analysis provides a focus for the choice of an appropriate valuation methodology. If a property’s current use is its highest and best use, its most probable selling price will ordinarily be a function of the existing use. Should the use of either the land as if vacant, or an alternative use of the land and structures as developed be found to represent the most beneficial use, the market value of the asset will likely be governed by this alternative.

The estimation and analysis of this optimum and probable use to which the property may be put normally encompasses consideration of the compatibility of the existing use and any suggested alternative use for which a property may be utilized in conjunction with:

- (a) the Zoning, Official Planning and other legal and political restraints on the use of the property;
- (b) the economic and market trends, supply and demand situation for the suggested use;
- (c) the expectations of the surrounding community;
- (d) the financial feasibility of the contemplated use; and,
- (e) the physical attributes and limitations of the site and its location, including the availability of services necessary to support alternative uses.

The highest and best use of the site as if vacant, considering the location, alternate potential feasible and legal uses as well as current zoning and land uses in the neighbourhood would be for residential purposes.

APPROACHES TO VALUE

There are three traditional approaches to value typically utilized in the valuation of real property. Within each approach are numerous methods. The type of property and the interest being valued determines what approaches and methods are applicable.

COST APPROACH

This method is based on the cost of a property's improvements, less all sources of depreciation. The resulting figure is added to the estimated land value, utilizing the Direct Comparison Approach.

DIRECT COMPARISON APPROACH

The Direct Comparison Approach considers that a property's value is directly related to prices paid for other competitive and like properties. This approach to value directly compares sale prices per physical units of measure (i.e. suites, rooms, square feet, front foot, acres, etc.).

INCOME APPROACH

The Income Approach considers a property's ability to provide an income stream over its economic life as a reflection of its present value.

APPLICABLE APPROACHES

Each of the above approaches can be applied to some extent in the valuation of vacant lands. The Direct Comparison Approach is often the most effective. The Income Approach and the Cost Approach were not considered applicable to this type of property.

DIRECT COMPARISON APPROACH

The principle of substitution proposes that a prudent buyer will not pay more for a property than it would cost to buy an equally desirable substitute property, provided that there is not undue delay in making the acquisition. The Direct Comparison Approach is based upon this principle. Seldom is there any commodity that is bought or sold that does not undergo a comparative analysis. One of the basic principles in the marketplace is to decide by direct comparison whether the price of a commodity is fair.

There are five basic steps in the Direct Comparison Approach:

1. Assemble current sales of properties that are as closely comparable to the subject as possible. In addition to sales data, consideration should be given to current listings.
2. All pertinent data such as sale price, date, legal description, etc., should be validated.
3. The data derived from each sale should be analyzed with regards to date of sale (time), terms, location, motivation, marketing time, physical condition, etc.
4. Each sale is then compared to the subject property with adjustments made to the comparable sale to compensate for inferior or superior qualities.
5. The data is weighed and correlated to arrive at an indicated value for the subject property.

The method is relatively simple in its approach since it considers the same criteria utilized by a prospective purchaser. Its reliability depends on the similarity between the comparable and the subject property plus the skill and care exercised in making adjustments for various differences that exist.

Preamble

In an ideal market situation for applying the Comparison Approach to value, the following conditions would prevail:

- A large number of sales have occurred between buyers and sellers who are knowledgeable of the local market.
- The sales are closely comparable to the subject property.
- The terms of the sale are identical.
- The sales are all very recent.
- The sales are “normally distributed” in a statistical sense.

Unfortunately, even in the best of conditions, there are usually insufficient sales that are reasonably comparable. The question must be asked “What is a good comparable?” The limits on comparability depend on the type of property involved. A good comparable is one that would be a reasonable alternative for most prospective buyers who would be interested in the subject property.

Although none of the following properties are exactly identical to the subject property, they lend insight into how the market would react to the subject property.

SITE VALUE

There are several methods for developing a value for the underlying site. The site value is required for the Cost Approach calculations but can also be used for the development of ratios in the Income Approach.

1. Comparative Sales Method – sales and other data for similar parcels of land are analyzed, compared, and adjusted to provide a value indication for the land being appraised. In the comparison process, the similarity or dissimilarity of the parcels is considered. This is the most common technique for valuing land and it is the preferred method of land valuation, provided there are sufficient comparable land sales available for analysis.
2. The Abstraction Method – is used where few sales are found. It involves allocation of the appraised total value of the property between land and buildings. Reliance is placed on typical ratios of land to improvement in the particular category under consideration.
3. Extraction – is a technique whereby the depreciated value of the building is extracted from the total sale price of an improved property to indicate the value of the land.
4. Subdivision Development – can be used where a project is proposed for a site by estimating the probable selling price of the units and extracting all expenses including builder's profit.
5. Land Residual Technique – capitalizes into value the residual income imputable to the land as obtained with a new building improvement which is the highest and best use of the land.

In most instances, the Comparative Sales Method is the most reliable technique, particularly when there are sufficient comparable sites for comparison.

COMPARATIVE SALES METHOD

The comparative Sales Method is identical to the Direct Comparison Approach and remains the best method for this type of property provided comparable sales can be found. In this case a number of comparable sales were found in the vicinity of the Property.

Adjustments for items below were considered but not necessarily applied:

- Rights Conveyed
- Financing Adjustments
- Conditions of Sale
- Date of Sale
- Location
- Site Size
- Other Adjustments

RECENT RELATED RESIDENTIAL SITE SALES COLCHESTER



Sale #1
MLS# 23005114
 Lot 7 Sinasac E
 Harrow
 Sale Date: 04/18/23
 Sale Price: \$140,000
 Site Size: 6,103.13 sf



Sale #4
MLS# 23023367
 111 Walnut St. S
 Harrow
 Sale Date: 03/21/24
 Sale Price: \$200,000
 Site Size: 11,173 sf



Sale #2
MLS# 23003310
 595 Jackson St.
 Harrow
 Sale Date: 05/19/23
 Sale Price: \$159,000
 Site Size: 7,987 sf



Sale #5
MLS# 24011241
 V/L Belcreeft Drive
 Harrow
 Sale Date: 06/28/24
 Sale Price: \$125,000
 Site Size: 4,550 sf



Sale #3
MLS# 23012738
 35 Draper Street
 Harrow
 Sale Date: 08/24/23
 Sale Price: \$250,000
 Site Size: 20,602 sf

Comparable Sales Map

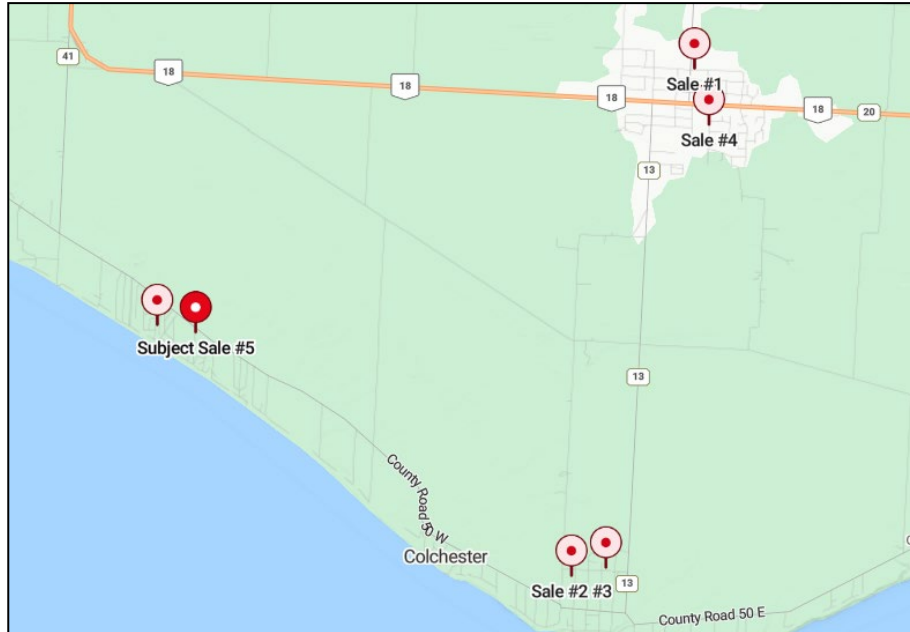


Chart # 1

#	MLS #	ADDRESS	DATE	DOM	SALE PRICE	Frontage	Price per Front Foot	Square Footage	Price PSF
1	MLS# 23005114 PIN# 751970276	Lot 7 Sinasac E Harrow	04/18/23	16	\$140,000	50.26'	2,785.52	6,103.13	\$22.94
2	MLS# 23003310 PIN# 751920265	595 Jackson St. Harrow	05/19/23	87	\$159,000	40'	3,975	7,987	\$19.90
3	MLS# 23012738 PIN# 751920313	35 Draper St. Harrow	08/24/23	56	\$250,000	75'	3,333	20,602	\$12.13
4	MLS# 23023367 PIN# 751990087	111 Walnut St.. Harrow	03/21/24	128	\$200,000	77.99'	2,564	11,173	\$17.90
5	MLS# 24011241 PIN# 751900849	V/L Belcreft Dr Harrow	06/28/24	49	\$125,000	91.21'	1,370	4,550	\$27.47
		Average		67.2	\$174,800.00	55.74'	2,805.5	7,861.5	\$20.07
	751900401	671 Beach Road	06/14/24						

Chart 1 Observations

	Low +/-	High +/-	Average +/-
Sale Date	April 2023	June 2024	
Sale Price	\$125,000	\$250,000	\$174,800
Front Feet	40'	91.21'	55.74'
Sale Price Per Front Foot	\$1,370	\$3,975	\$2,805.5
Square Footage	4,550 sf	20,602 sf	7,861.5 sf
Sale Price PSF	\$12.13psf	\$27.47psf	\$20.07psf

The previous two charts in this section provide summaries of pertinent information with respect to each transaction. All of the reference properties have a primary zoning designation of “R” Residential and all are considered to be arms-length transactions.

Chart # 1 was a summary of properties purchased in the Municipality of Colchester. The average sale price square foot of these transactions was \$20.07psf.

- The range was from \$12.13psf to \$27.47psf.
- Sale # 5 was the most recent sale and was also most similar in location

These sales represent sales of properties purchased primarily for residential purposes.

Highest and best use of the properties in the area affected by the required drain is single family residential construction.

Five sales in the subject immediate neighbourhood were selected for adjustment and considered most similar to the subject property. These sales represent sales of properties purchased specifically for cash crop and greenhouse construction.

The most appropriate adjustment method in this case is the “Property to Property Comparison”, whereby we attempt to bracket the subject property between comparable sales both superior (more valuable) and inferior (less valuable). If a significant item or component of the comparable property is superior to or more favourable than the subject, a minus (-) adjustment is considered, thus reducing the indicated value of the subject. If a significant item in the comparable property is inferior to, or less favourable than, the subject Property, a plus (+) adjustment is considered, thus increasing the indicated value of the subject. This approach emphasizes individual comparable sales as a whole and undivided entity, which is exactly what a buyer does.

Adjustments are based on both quantitative market data and qualitative considerations. An adjusted rate paid per acre was then estimated and applied to the Property’s gross acreage in order to estimate its Market Value.

Rights Conveyed

In analyzing the sales used it was determined that in all cases the rights conveyed were Fee Simple and no adjustment was required.

Financing

There was insufficient information available concerning the sales to determine if there were any unusual financing conditions that may have influenced the prices payable so it was assumed that all sales took place under normal circumstances with no adjustments required for financing.

Conditions of Sale Adjustment

Each of the transactions was reported to have involved cash to the vendor with no unusual conditions or restrictions.

Time

The sales chosen for consideration represent sales over the past 16 months. Considering the above, it would appear from the above that a minimal adjustment would need to be applied to the selected sales for time.

Location

The subject is located in the Municipality of Colchester and all sales were within the same community/similar location. Therefore, no adjustments were made for the location.

Lot Size

No adjustment was considered appropriate for size

Zoning

All comparable sales had similar zoning to the subject site with no adjustment considered appropriate.

Services

The subject properties have typical municipal services available and no adjustment was considered appropriate.

Even properties which are side by side must be considered on an individual basis and under no circumstances can they be considered identical enough to apply the same unit value (per square foot) to arrive at a market value for the property.

Two common statistical measures are the mean and the median. Both measure central tendency and are used to identify typical variate in a population or sample.

Services available to the sites include municipal water, hydro, gas and telephone.


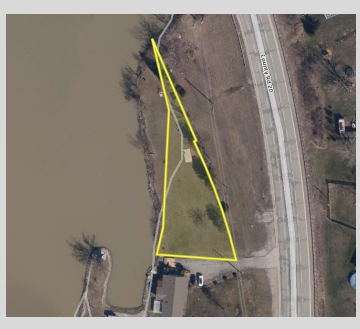



The average adjusted sale price indicated from the adjusted value of the five sales selected as being most similar to the subject property was \$20.07psf.

The sales selected are in close proximity to the Langlois-Arner Drain and Outlet.

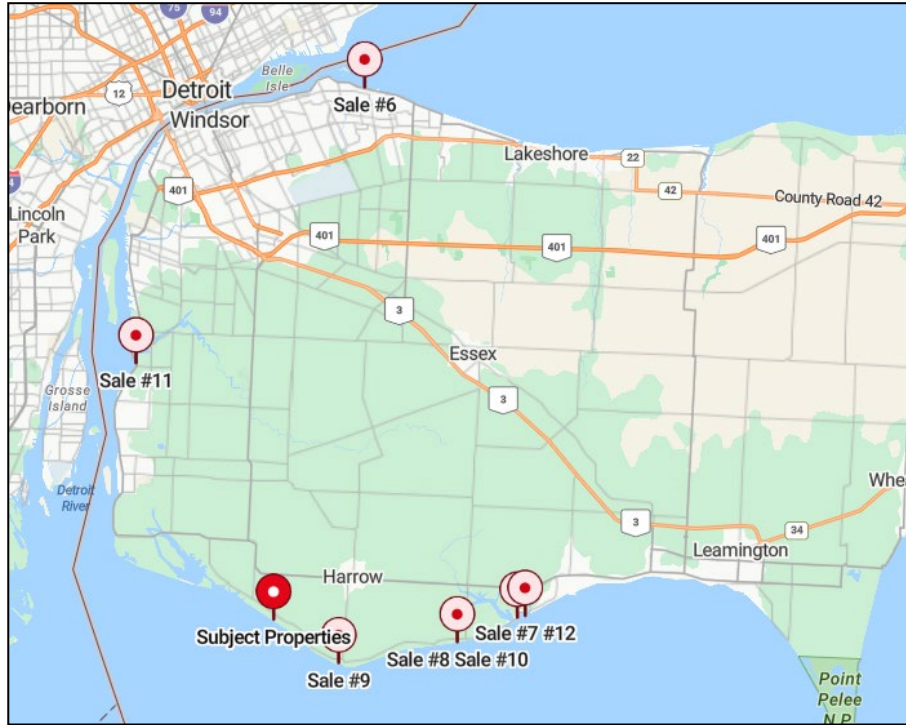
In consideration of the above and after reviewing those sales considered most suitable for comparison with the subject property in terms of location, size, soil type municipal services, the appraiser is of the opinion that a value of \$25.00psf per acre is indicative of the square foot value of the partial takings.

The estimated land value from the Comparison Approach to Value is:**Current Market Value of Residential Partial Takings****TWENTY-FIVE DOLLARS PER SQUARE FOOT****\$25.00PSF**

RECENT RELATED WATERFRONT RESIDENTIAL SITE SALES

	<p><u>Sale #6</u> MLS# 21001619 11200 Riverside Dr. E Windsor Sale Date: 04/13/21 Sale Price: \$450,000 Site Size: 18,295.2 sf</p>		<p><u>Sale #10</u> MLS# 22017387 V/L Maple Grove Dr. Essex Sale Date: 07/08/22 Sale Price: \$787,500 Site Size: 23,914.44 sf</p>
	<p><u>Sale #7</u> MLS# 20009578 1105 Heritage Road Kingsville Sale Date: 04/30/21 Sale Price: \$475,000 Site Size: 21,649.32 sf</p>		<p><u>Sale #11</u> MLS# 23002097 V/L Front Rd N. Amherstburg Sale Date: 03/10/23 Sale Price: \$280,000 Site Size: 17,362.17 sf</p>
	<p><u>Sale #8</u> MLS# 21004652 983 Waters Beach Essex Sale Date: 06/08/21 Sale Price: \$685,000 Site Size: 31,012.72 sf</p>		<p><u>Sale #12</u> MLS# 23009335 1057 Cedar Drive Kingsville Sale Date: 08/16/23 Sale Price: \$226,000 Site Size: 9,784.39 sf</p>
	<p><u>Sale #9</u> MLS# 21010393 43 Sullivan Essex Sale Date: 06/28/21 Sale Price: \$436,130 Site Size: 12,819.80 sf</p>		

Comparable Sales Map



SELECTED VACANT WATERFRONT LAND SALES SUMMARY CHART

#	MLS #	ADDRESS	DATE	DOM	SALE PRICE	Frontage	Price per Front Foot	Square Footage	Price PSF
1	MLS# 21001619 PIN# 010540415	11200 Riverside Windsor	04/13/21	63	\$450,000	44.78'	\$10,049	18,295.20	\$24.60
2	MLS# 20009578 PIN# 751850355	1105 Heritage Rd Kingsville	04/30/21	270	\$475,000	75.85'	\$6,262	21,649.32	\$21.94
3	MLS# 21004652 PIN# 751860048	983 Waters Beach Essex	06/08/21	61	\$685,000	99.25'	\$6,902	31,012.72	\$22.09
4	MLS# 21010393 PIN#751890409	43 Sullivan Harrow	06/28/21	10	\$436,130	40'	\$10,903	12,819.80	\$34.02
5	MLS# 22017387 PIN# 751860043	Maple Grove Dr. Harrow	07/08/22	5	\$787,500	75'	\$11,025	23,914.44	\$40.77
	MLS# 23002097 PIN#705510087	V/L Front Rd N. Amherstburg	03/10/23	27	\$280,000	194'	\$1,443	17,362.17	\$16.13
	MLS# 23009335 PIN# 751859408	1057 Cedar Drive Kingsville	08/16/23	91	\$226,000	168.76'	\$1,339	9,784.39	\$23.09
		Average		75.29	\$477,090.00	87.21'	\$6,846.14	19,262.58	\$26.09

Chart Observations 1

	Low +/-	High +/-	Average +/-
Sale Date	April 2021	August - 2023	
Sale Price	\$226,000	\$787,500	\$477,090
Front Feet	40'	194'	87.21'
Sale Price Per Front Foot	\$1,339	\$11,025	\$6,846.14
Square Footage	31,012.72sf	9,784.39sf	19,962.58 sf
Sale Price PSF	\$16.13psf	\$40.77psf	\$26.09 psf

In arriving at a value for the site of the subject property, consideration was given to square footage of the sites.

The previous charts in this section provide summaries of pertinent information with respect to each transaction. All of the reference properties have a primary zoning designation of “R” Residential or comparable type zoning and all are considered to be arms-length transactions.

The lower values were for dated sales, inferior locations and minimal municipal amenities available.

The subjects are in an average waterfront location in the Town of Essex with typical municipal services.

After analysing this data, a per square foot value was selected and applied to the subject properties’ size to estimate its unit market value as of the effective date.

Adjustment Chart

#	MLS #	ADDRESS	LOCATION	DATE	TIME	SALE PRICE	Square Footage	Price PSF	Adjusted Price PSF
6	MLS# 21001619 PIN# 010540415	11200 Riverside Windsor	+	04/13/21	+	\$450,000	18,295.20	\$24.60	\$28.00
7	MLS# 20009578 PIN# 751850355	1105 Heritage Rd Kingsville	+	04/30/21	+	\$475,000	21,649.32	\$21.94	\$28.00
8	MLS# 21004652 PIN# 751860048	983 Waters Beach Essex	=	06/08/21	+	\$685,000	31,012.72	\$22.09	\$25.00
9	MLS# 21010393 PIN#751890409	43 Sullivan Harrow	=	06/28/21	+	\$436,130	12,819.80	\$34.02	\$35.00
10	MLS# 22017387 PIN# 751860043	Maple Grove Dr. Harrow	=	07/08/22	+	\$787,500	23,914.44	\$40.77	\$30.00
11	MLS# 23002097 PIN#705510087	V/L Front Rd N. Amherstburg	-	03/10/23	+	\$280,000	17,362.17	\$16.13	\$19.36
12	MLS# 23009335 PIN# 751859408	1057 Cedar Drive Kingsville	-	08/16/23	+	\$226,000	9,784.39	\$23.09	\$25.40
		Average				\$477,090.00	19,262.58	\$26.09	\$27.25

The most appropriate adjustment method in this case is the “Property to Property Comparison”, whereby we attempt to bracket the subject property between comparable sales both superior (more valuable) and inferior (less valuable). If a significant item or component of the comparable property is superior to or more favourable than the subject, a minus (-) adjustment is considered, thus reducing the indicated value of the subject. If a significant item in the comparable property is inferior to, or less favourable than, the subject Property, a plus (+) adjustment is considered, thus increasing the indicated value of the subject. This approach emphasizes individual comparable sales as a whole and undivided entity, which is exactly what a buyer does.

Adjustments are based on both quantitative market data and qualitative considerations. An adjusted rate paid per square foot was then estimated and applied to the Property’s acreage area in order to estimate its Market Value.

Location

An adjustment was made to the indicated values for significant variations in location. The subject was considered to be in an average location.

Lot Size

Lot sizes were considered a contributing factor in prices paid and adjustments were made based on significant variations in site sizes.

Zoning

All comparable sales had similar zoning to the subject property.

The foregoing summary charts supply statistical information about sales in the market place. Although the more traditional appraisal analysis techniques are utilized, the results of the statistical analysis are of general assistance.

Generally speaking the primary factor influencing value is location and the closer a property is to a larger centre the greater its value. Other factors that contribute significantly to a property’s value are configuration, municipal amenities available and most importantly size.

Based on the foregoing observations and considering the size, shape and location of the subject sites, a per square foot value for the subject partial taking is estimated to be approximately \$27.25 per square foot.

Current Market Value of Partial Takings Waterfront
TWENTY-SEVEN DOLLARS AND TWENTY-FIVE CENTS PER SQUARE FOOT
\$27.25 PSF

EXTRAORDINARY ASSUMPTIONS AND LIMITING CONDITIONS:

The certification that appears in this appraisal report is subject to compliance with the Personal Information and Electronics Documents Act (PIPEDA), Canadian Uniform Standards of Professional Appraisal Practice (“CUSPAP”) and the following conditions:

1. This report is prepared at the request of the client and for the specific use referred to herein. It is not reasonable for any other party to rely on this appraisal without first obtaining written authorization from the client, the authors, subject to the qualification below. Liability is expressly denied to any person other than the client and those who obtain written consent and, accordingly, no responsibility is accepted for any damage suffered by any such person as a result of decisions made or actions based on this report. Diligence by all intended users is assumed.
2. Because market conditions, including economic, social and political factors change rapidly and, on occasion, without warning, the market value estimate expressed as of the date of this appraisal cannot be relied upon as of any other date except with further advice from the appraiser and confirmed in writing.
3. The appraiser will not be responsible for matters of a legal nature that affect either the property being appraised or the title to it. No registry office search has been performed and the appraiser assumes that the title is good and marketable and free and clear of all encumbrances including leases, unless otherwise noted in this report. The property is appraised on the basis of it being under responsible ownership.
4. The subject property is presumed to comply with government regulations including zoning, building codes and health regulations and, if it doesn't comply, its non-compliance may affect market value.
5. No survey of the property has been made. Any sketch in the appraisal report shows approximate dimensions and is included only to assist the reader of the report in visualizing the property.
6. This report is completed on the basis that testimony or appearance in court concerning this appraisal is not required unless specific arrangements to do so have been made beforehand. Such arrangements will include, but not necessarily be limited to, adequate time to review the appraisal report and data related thereto and the provision of appropriate compensation.
7. Unless otherwise stated in this report, the appraiser has no knowledge of any hidden or unapparent conditions of the property (including, but not limited to, its soils, physical structure, mechanical or other operating systems, its foundation, etc.) or adverse environmental conditions (on it or a neighbouring property, including the presence of hazardous wastes, toxic substances, etc.) that would make the property more or less valuable. It has been assumed that there are no such conditions unless they were observed at the time of inspection or became apparent during the normal research involved in completing the appraisal. This report should not be construed as an environmental audit or detailed property condition report, as such reporting is beyond the scope of this report and/or the qualifications of the appraiser. The author makes no guarantees or warranties, express or implied, regarding the condition of the property, and will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. The bearing capacity of the soil is assumed to be adequate.

8. The appraiser is not qualified to comment on environmental issues that may affect the market value of the property appraised, including but not limited to pollution or contamination of land, buildings, water, groundwater or air. Unless expressly stated, the property is assumed to be free and clear of pollutants and contaminants, including but not limited to moulds or mildews or the conditions that might give rise to either, and in compliance with all regulatory environmental requirements, government or otherwise, and free of any environmental condition, past, present or future, that might affect the market value of the property appraised. If the party relying on this report requires information about environmental issues then that party is cautioned to retain an expert qualified in such issues. We expressly deny any legal liability relating to the effect of environmental issues on the market value of the subject property.
9. The analyses set out in this report relied on written and verbal information obtained from a variety of sources we considered reliable. Unless otherwise stated herein, we did not verify client-supplied information, which we believed to be correct.
10. The term “inspection” refers to observation and reporting of the general material finishing and conditions seen for the purposes of a standard appraisal inspection. The inspection scope of work includes the identification of marketable characteristics/amenities offered for comparison and valuation purposes only, in accordance with the CUSPAP.
11. The opinions of value and other conclusions contained herein assume satisfactory completion of any work remaining to be completed in a good and workmanlike manner. Further inspection may be required to confirm completion of such work. The appraiser has not confirmed that all mandatory building inspections have been completed to date, nor has the availability/issuance of an occupancy permit been confirmed. The appraiser has not evaluated the quality of construction, workmanship or materials. It should be clearly understood that this physical inspection does not imply compliance with any building code requirements as this is beyond the professional expertise of the appraiser.
12. The contents of this report are confidential and will not be disclosed by the author to any party except as provided for by the provisions of the CUSPAP and/or when properly entered into evidence of a duly qualified judicial or quasi-judicial body. The appraiser acknowledges that the information collected herein is personal and confidential and shall not use or disclose the contents of this report except as provided for in the provisions of the CUSPAP and in accordance with the appraiser's privacy policy. The client agrees that in accepting this report, it shall maintain the confidentiality and privacy of any personal information contained herein and shall comply in all material respects with the contents of the appraiser's privacy policy and in accordance with the PIPEDA.
13. The appraiser has agreed to enter into the assignment as requested by the client named in the report for the use specified by the client, which is stated in the report. The client has agreed that the performance of this appraisal and the report format are appropriate for the intended use.
14. Written consent from the authors must be obtained before any part of the appraisal report can be used for any use by anyone except the client and other intended users identified in the report. Where the client is the mortgagee and the loan is insured, liability is extended to the mortgage insurer. Liability to any other party or for any other use is expressly denied regardless of who pays the appraisal fee.

15. This report form is the property of the Appraisal Institute of Canada (AIC) and for use only by AIC members in good standing. Use by any other person is a violation of AIC copyright. This appraisal report, its content and all attachments/addendums and their content are the property of the author. The client, intended users and any appraisal facilitator are prohibited, strictly forbidden and no permission is expressly or implicitly granted or deemed to be granted, to modify, alter, merge, publish (in whole or in part) screen scrape, database scrape, exploit, reproduce, decompile, reassemble or participate in any other activity intended to separate, collect, store, reorganize, scan, copy, manipulate electronically, digitally, manually or by any other means whatsoever this appraisal report, addendum, all attachments and the data contained within for any commercial, or other, use.
16. If transmitted electronically, this report will have been digitally signed and secured with personal passwords to lock the appraisal file. Due to the possibility of digital modification, only originally signed reports and those reports sent directly by the appraiser, can be relied upon without fault.
17. Where the intended use of this report is for financing or mortgage lending, it is a condition of reliance on this report that the authorized user has or will conduct loan underwriting and rigorous due diligence in accordance with the standards of a reasonable and prudent lender, including but not limited to ensuring the borrower's demonstrated willingness and capacity to service his/her debt obligations on a timely basis, and to conduct such loan underwriting and due diligence in accordance with the standards set out by the Office of the Superintendent of Financial Institutions (OSFI) Residential Mortgage Underwriting Practices and Procedures B-24, even when not otherwise required by law. Liability is expressly denied to those that do not meet this condition.

CERTIFICATION

I certify that, to the best of my knowledge and belief:

- The statements of fact contained in this report are to the best of our knowledge true and correct;
- The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions and are our impartial and unbiased professional analyses, opinions, and conclusions;
- We have no past, present or prospective interest in the property that is the subject of this report, and we have no personal and/or professional interest or conflict with respect to the parties involved with this assignment.
- We have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment;
- Our engagement in and compensation is not contingent upon developing or reporting predetermined results, the amount of value estimate, a conclusion favouring the client, or the occurrence of a subsequent event.
- Our analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the CUSPAP.
- We have the knowledge and experience to complete this assignment competently, and where applicable this report is co-signed in compliance with the Canadian Uniform Standards of Professional Appraisal Practice of the Appraisal Institute of Canada.
- Except as herein disclosed, no one has provided significant professional assistance to the person(s) signing this report;
- As of the dated of this report, the undersigned has fulfilled the requirements of the AIC's Continuing Professional Development Program;
- Don Fuerth, B.A., AACI, P.App. and Cara Pazur, B.A., AIC Candidate Member, personally inspected the Subject Property on June 14th 2024. No one, other than those named in the certification pages herein, provided assistance to the undersigned with preparation of this report.
- The undersigned are members in good standing of the Appraisal Institute of Canada. Where a report bears two signatures, both the signing appraiser and co-signing appraiser assume full responsibility for the report.
- Don Fuerth directly supervised the appraiser who prepared this appraisal report and, having reviewed the report, agree with the statements and conclusions of the appraiser, agree to be bound by the appraiser's certification and is taking full responsibility for the appraisal and the appraisal report.

PROPERTY IDENTIFICATION

Address: 671 Ambassador Beach Road **City:** Town of Essex
Province: Ontario **Postal Code:** N0R 1G0

Legal Description: Lt 16-18 Pl 1397 Colchester; Pt Private Drive Pl 1397 Colchester; Pt 2 Ft Reserve Pl 1397 Colchester Pt 7, 12R9585, Pt 1, 2, 3 & 4, 12R17792; S/T Interest In R1428555, R1487215, R1513744; S/T R1487215; T/W R1428555, R1513744; S/T R1085717, R1096684; Essex

Address: 131 Ambassador Beach Road **City:** Town of Essex
Province: Ontario **Postal Code:** N0R 1G0

Legal Description: Lot 1-11 Plan 1397 Colchester; Part 1 Ft Reserve Plan 1397 Colchester; Part 2 Ft Reserve Plan 1397 Colchester; Part Private Drive Plan 1397 Colchester (Aka Ambassador Beach Rd); Patt L0t 91 Concession 1 Or Front Colchester Parts 2, 3, 4 & 5, 12r29145; S/T R1090856; S/T R1096684 Town Of Esse

Based upon the data, analyses and conclusions contained herein, the market value of the interest in the property described as at June 14th 2024 is estimated at:

Current Market Value of Residential Partial Takings
TWENTY-FIVE DOLLARS PER SQUARE FOOT
\$25.00 per square foot

Current Market Value of Partial Takings Waterfront
TWENTY-SEVEN DOLLARS AND TWENTY-FIVE CENTS PER SQUARE FOOT
\$27.25 per square foot

APPRAISER

Respectfully,
 FUERLAND REALTY LTD


 Don Fuerth B.A., AACI, P. App

NAME: Don Fuerth
 AIC DESIGNATION/STATUS: AACI, P.App
 Membership #: 702855
 DATE OF REPORT/DATE SIGNED: July 29th 2024
 PERSONALLY INSPECTED THE SUBJECT PROPERTY: Yes
 DATE OF REVIEW: June 14th 2024

AIC CANDIDATE MEMBER

Respectfully,
 FUERLAND REALTY LTD.


 Cara Pazur, B.A., AIC Candidate Member

NAME: Cara Pazur
 AIC DESIGNATION/STATUS: AIC Candidate Member
 Membership #: 918332
 DATE OF REPORT/DATE SIGNED: July 29th 2024
 PERSONALLY INSPECTED THE SUBJECT PROPERTY: Yes
 DATE OF REVIEW: June 14th 2024

ADDENDA

Curriculum Vitae and Clients Served – 2024

Don Fuerth B.A., AACI, P.App.

Professional Appraiser, Real Estate Broker, Realtor®

2260 Foster Avenue, Windsor, ON N8W 5C9

Telephone: (519) 966-0881

Email: dfuerth@fuerlandrealty.com

Summary

Don Fuerth is an experienced professional Real Estate Broker and Appraiser who has Land Use and Land Development experience. He has completed a variety of appraisal and consulting assignments to assist in Mortgage Financing, Power of Sale, Deemed Dispositions, HST and Capital Gains Issues involving Canada Revenue Agency (CRA), Expropriation, Family Law, Assessment Appeals and Litigation support.

Experience

Real Estate Appraiser

Fuerland Realty Ltd., Don Fuerth Broker/Owner

Appraiser of single and multi-family residential, agricultural, commercial, institutional and industrial properties since September 1995.

Real Estate Broker

Real Estate Brokerage - Fuerland Realty Ltd. We are an active brokerage providing assistance in purchases, sales, leasing and construction for all types of real estate. We maintain MLS® membership to obtain legal access to various real estate board open market systems.

Real Estate Appraisal and Counseling involves one or more of the following services:

- Real Estate Appraisal,
- Litigation support,
- Expropriation Appraisals including Injurious Affection Studies,
- Assessment Appeals,
- Property Tax Issues,
- Project feasibility study and analysis, and
- Property portfolio analysis and evaluation.

Experience

2001 – Present Chief Appraiser Fuerland Realty Ltd.

1994 – 2000 - Associate Appraiser E.S. Gorski & Associates

Related Experience

- Graduated from University of Windsor 1963
- Teacher's Certificate from University of Western Ontario -1965
- 1963 – 1980 Head of Modern Language Department and Guidance Counselor
- 1970 – 1988 Full time dairy and cash crop farmer
- 1988 – 1990 Full time construction and excavation contractor
- December 1990 successfully completed the "Salesperson Program" in real estate as presented by The Ontario Real Estate Association
- Licensed under the Ontario Real Estate and Business Brokers Act as a Broker, December 2nd 2002. Registration No. 3349461
- Director Windsor/Essex County Real Estate Board 1998 – 2002
- President Windsor/Essex County Real Estate Board 2002 – 2003
- Past President Windsor/Essex County Real Estate Board 2003 – 2004
- Chairman Building Committee Windsor/Essex County Real Estate Board 1998 – 2004
- Full member, National Commercial Council, Canadian Real Estate Association, 2001, also a Full Member, Commercial Council Windsor/Essex County Real Estate Board.

Appraisal Assignments have included:

- Funeral Homes
- Institutional buildings
- Retirement Homes
- Special Use Properties
- Rooming Houses
- Office Towers
- Apartment buildings
- Real property housing a single dwelling
- Multi-family buildings
- Industrial properties
- Churches
- Retail commercial properties
- Hotels/Motels
- Mobile Home/Trailer Parks
- Marinas
- Golf Courses
- Farms and Farm Land
- Intensive Farms (e.g. Livestock, Greenhouse and Winery Operations)
- Agricultural support properties
- Market Rent Studies
- Land
 - Commercial/industrial/residential land awaiting development
 - Building lots – on water and not on water

Professional Education

AACI Accredited Appraiser Canadian Institute Certificate # 702855
The Appraisal Institute of Canada awarded use of this professional designation on October 28th 2003.

P.App Professional Appraiser
Granted by the Appraisal Institute of Canada to all holders of the AACI designation.

CRA Canadian Residential Appraiser, Relinquished October 28th 2003

B.A. Bachelor of Arts granted by the University of Windsor May 1963

Membership

- Appraisal Institute of Canada
- Ontario Real Estate Association
- The Canadian Real Estate Association
- The Windsor/Essex County Real Estate Board
- The Commercial Council of Canadian Real Estate Association
- Together with full access to numerous other Real Estate Boards.

Clients Served (partial list only)

- Libro Credit Union
- Motor City Community Credit Union
- Bank of Montreal
- Canadian Imperial Bank of Commerce
- Royal Lepage Relocation
- Canada Mortgage and Housing Corp.
- Farm Credit
- County of Essex
- Town of Tecumseh
- Town of Amherstburg
- Town of Kingsville
- Royal Bank of Canada
- Prudential Relocation
- London Life - Freedom Financial
- Remax Relocation
- Hydro One Networks
- Unimor Capital Corporation
- Windsor Family Credit Union
- Ing Mortgages
- First National Financial Corporation
- Korea Exchange Bank
- Manulife Bank
- Ukrainian Credit Union
- Concentra Financial Services
- Law Firms
 - McCarthy Tetrault
 - Paul Mullins
 - Hickey & Byrne
 - Paroian & Skipper
 - And many more
- Accounting Firms
 - KPMG Inc.
 - Ernst & Young
 - LBDO Dunwoody & Associates
 - Deloitte & Touche
 - Hyatt Lassaline
 - Collins Barrow

INSURANCE CERTIFICATE - CERTIFICAT D'ASSURANCE

Sponsoring Entity/Entité commanditaire:	APPRAISAL INSTITUTE OF CANADA/INSTITUT CANADIEN DES ÉVALUATEURS
Insured/Assuré:	Donald Fuerth
Address of Insured/ Adresse de l'assuré:	2260 Foster Ave Windsor, ON N8W 5C9
Certificate Number/Certificat No.:	AIC 02148
Policy Period for Insured/Période d'assurance pour l'assuré:	December 31, 2023 To December 31, 2024
AIC Membership Category / Catégorie de membre de l'ICE:	AACI - Accredited Appraiser Canadian Institute

This is to confirm for the indicated type of practice that the following insurance is in effect/

Le présent certificat confirme que l'assurance suivante est en vigueur pour la catégorie de pratique indiquée:

Master Policy/Police-cadre:

Insurer/Assureur	Policy No./No. de police	Policy Period/Période d'assurance	Coverage/Couverture
Trisura Guarantee Insurance Company/Compagnie d'assurance Trisura Garantie	NPL1003633	December 31, 2023 to December 31, 2024	Appraisers Professional Liability Insurance Policy/ Police d'assurance responsabilité professionnelle des évaluateurs

Sum Insured/Montant assuré:

\$2,000,000 per claim Limit of Liability and \$2,000,000 Aggregate Limit of Liability /

2 000 000 \$ limite de garantie par réclamation et 2 000 000 \$ limite de garantie globale

Date: December 21, 2023

Authorized Representative/Représentant autorisé

This document provides confirmation of coverage as described above for informational purposes only. Coverage is subject to the terms, conditions and limitations of the Master Policy in current use by the company./ Le présent document constitue une confirmation de votre couverture d'assurance, tel que décrit plus haut, et ce, uniquement à des fins d'information. Cette couverture est sujette aux modalités et aux limites de garantie de la police-cadre actuellement utilisée par la compagnie.

HUB International Ontario Limited
595 Bay Street, Suite 900, Toronto, ON M5G 2E3
Tel: 855-619-8242 aicinsurance@hubinternational.com

INSURANCE CERTIFICATE - CERTIFICAT D'ASSURANCE

Sponsoring Entity/Entité commanditaire:	APPRAISAL INSTITUTE OF CANADA/INSTITUT CANADIEN DES ÉVALUATEURS
Insured/Assuré:	Cara Pazur
Address of Insured/ Adresse de l'assuré:	2260 Foster Avenue Windsor, ON N8W 5C9
Certificate Number/Certificat No.:	AIC 11454
Policy Period for Insured/Période d'assurance pour l'assuré:	December 31, 2023 To December 31, 2024
AIC Membership Category / Catégorie de membre de l'ICE:	Candidate - Candidate Member

This is to confirm for the indicated type of practice that the following insurance is in effect/

Le présent certificat confirme que l'assurance suivante est en vigueur pour la catégorie de pratique indiquée:

Master Policy/Police-cadre:

Insurer/Assureur	Policy No./No. de police	Policy Period/Période d'assurance	Coverage/Couverture
Trisura Guarantee Insurance Company/Compagnie d'assurance Trisura Garantie	NPL1003633	December 31, 2023 to December 31, 2024	Appraisers Professional Liability Insurance Policy/ Police d'assurance responsabilité professionnelle des évaluateurs

Sum Insured/Montant assuré:

\$2,000,000 per claim Limit of Liability and **\$2,000,000** Aggregate Limit of Liability /

2 000 000 \$ limite de garantie par réclamation et **2 000 000 \$** limite de garantie globale

Date: December 21, 2023

Authorized Representative/Représentant autorisé

This document provides confirmation of coverage as described above for informational purposes only. Coverage is subject to the terms, conditions and limitations of the Master Policy in current use by the company. / Le présent document constitue une confirmation de votre couverture d'assurance, tel que décrit plus haut, et ce, uniquement à des fins d'information. Cette couverture est sujette aux modalités et aux limites de garantie de la police-cadre actuellement utilisée par la compagnie.

HUB International Ontario Limited
595 Bay Street, Suite 900, Toronto, ON M5G 2E3
Tel: 855-619-8242 aicinsurance@hubinternational.com

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APPENDIX "D"

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WATERSHED PLAN

OF THE
LANGLOIS-ARNER DRAINAGE SYSTEM & COLCHESTER HEIGHTS DRAINAGE SCHEME

IN THE
TOWN OF ESSEX
 (Geographic Townships of Colchester South)

IN THE
COUNTY OF ESSEX • ONTARIO

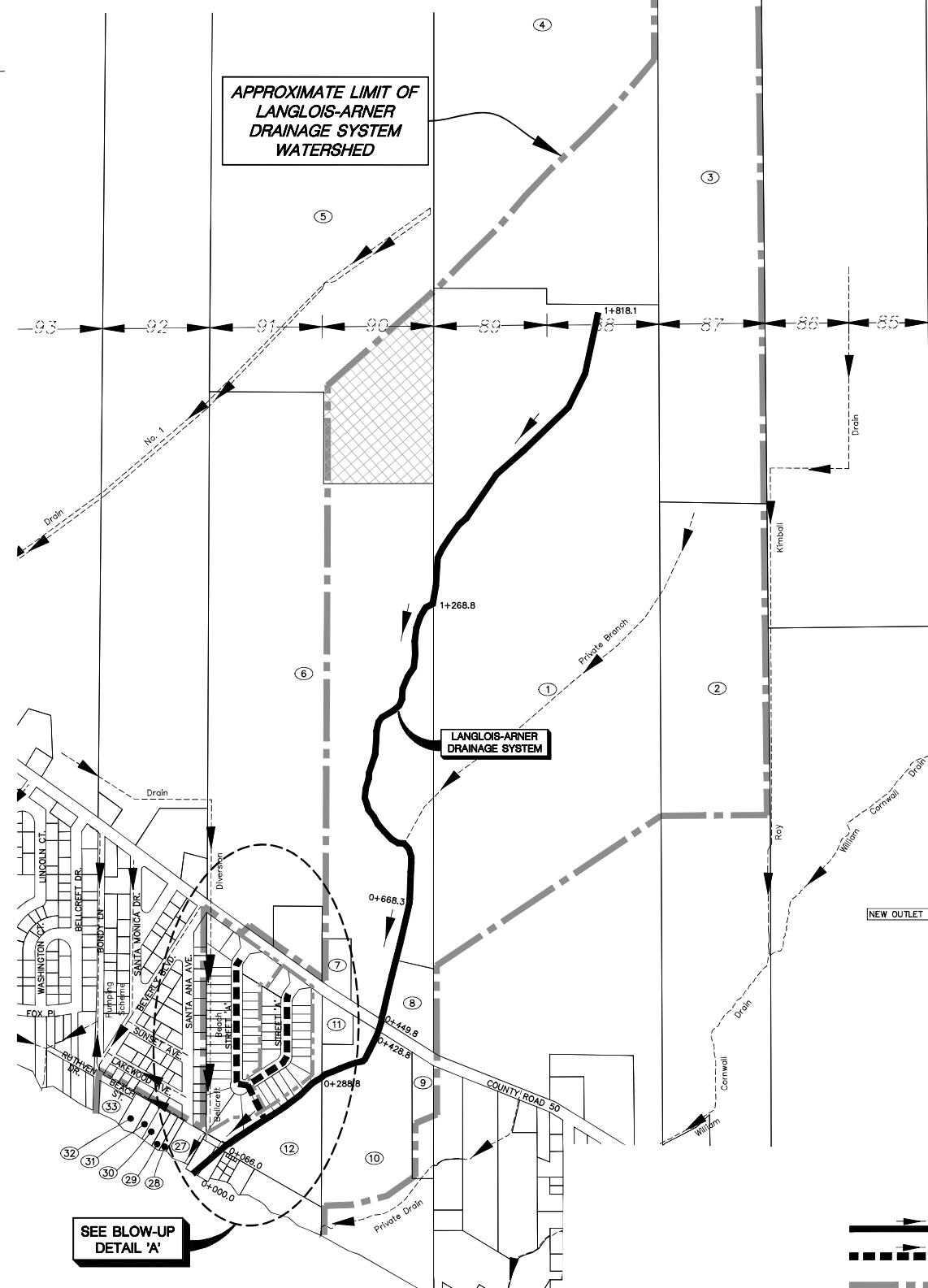
TOWN OF ESSEX

MAYOR: SHERRY BONDY
 CLERK: SHELLEY BROWN
 DRAINAGE SUPERINTENDENT: LINDSAY DEAN

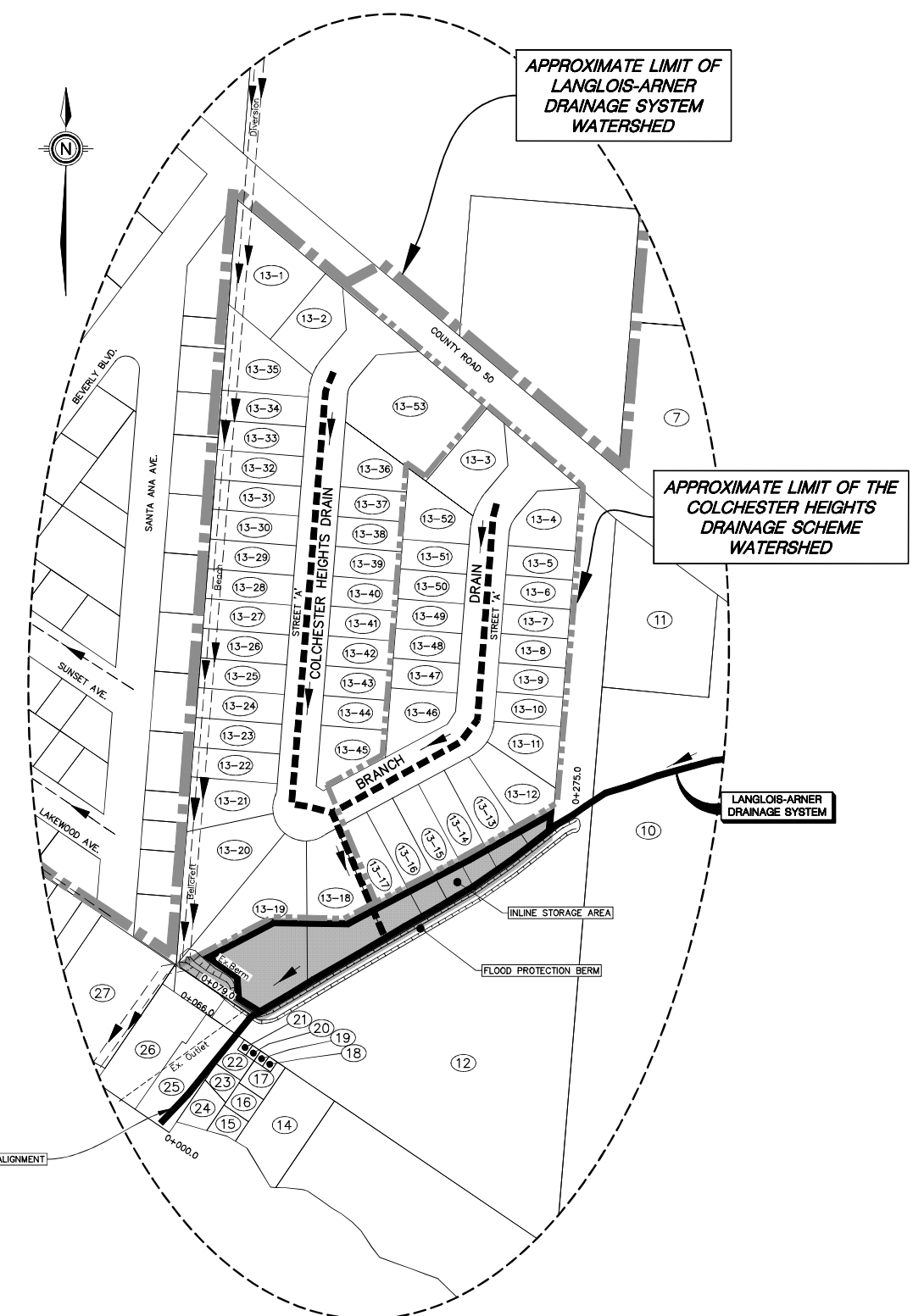
Original Sheet Size: ARCH Full Bleed D (36.00 x 24.00) Inches; 1:1



PARCEL I.D.	ROLL #	OWNER
1	660-20900	Gorski Land Holdings Inc.
2	660-21001	Gorski Land Holdings Inc.
3	660-22450	Thomas Lypps
4	660-22700	Thomas Lypps
5	670-00100	Gorski Land Holdings Inc.
6	670-03300	Gorski Land Holdings Inc.
7	670-03400	Jose & Celeste Damaso
8	670-03401	Denis & Jacqueline Lavigne
9	670-03503	Dillon Beausoleil
10	670-03600	Pleasure Beach Co-operative
11	670-03700	Peter & Judy Berg
12	670-03701	Gerald & Sherri Marantate & Susanne Poirier
13-1	670-03703 - Lot 1	Colchester Bay Inc.
13-2	670-03703 - Lot 2	Colchester Bay Inc.
13-3	670-03703 - Lot 3	Colchester Bay Inc.
13-4	670-03703 - Lot 4	Colchester Bay Inc.
13-5	670-03703 - Lot 5	Colchester Bay Inc.
13-6	670-03703 - Lot 6	Colchester Bay Inc.
13-7	670-03703 - Lot 7	Colchester Bay Inc.
13-8	670-03703 - Lot 8	Colchester Bay Inc.
13-9	670-03703 - Lot 9	Colchester Bay Inc.
13-10	670-03703 - Lot 10	Colchester Bay Inc.
13-11	670-03703 - Lot 11	Colchester Bay Inc.
13-12	670-03703 - Lot 12	Colchester Bay Inc.
13-13	670-03703 - Lot 13	Colchester Bay Inc.
13-14	670-03703 - Lot 14	Colchester Bay Inc.
13-15	670-03703 - Lot 15	Colchester Bay Inc.
13-16	670-03703 - Lot 16	Colchester Bay Inc.
13-17	670-03703 - Lot 17	Colchester Bay Inc.
13-18	670-03703 - Lot 18	Colchester Bay Inc.
13-19	670-03703 - Lot 19	Colchester Bay Inc.
13-20	670-03703 - Lot 20	Colchester Bay Inc.
13-21	670-03703 - Lot 21	Colchester Bay Inc.
13-22	670-03703 - Lot 22	Colchester Bay Inc.
13-23	670-03703 - Lot 23	Colchester Bay Inc.
13-24	670-03703 - Lot 24	Colchester Bay Inc.
13-25	670-03703 - Lot 25	Colchester Bay Inc.
13-26	670-03703 - Lot 26	Colchester Bay Inc.
13-27	670-03703 - Lot 27	Colchester Bay Inc.
13-28	670-03703 - Lot 28	Colchester Bay Inc.
13-29	670-03703 - Lot 29	Colchester Bay Inc.
13-30	670-03703 - Lot 30	Colchester Bay Inc.
13-31	670-03703 - Lot 31	Colchester Bay Inc.
13-32	670-03703 - Lot 32	Colchester Bay Inc.
13-33	670-03703 - Lot 33	Colchester Bay Inc.
13-34	670-03703 - Lot 34	Colchester Bay Inc.
13-35	670-03703 - Lot 35	Colchester Bay Inc.
13-36	670-03703 - Lot 36	Colchester Bay Inc.
13-37	670-03703 - Lot 37	Colchester Bay Inc.
13-38	670-03703 - Lot 38	Colchester Bay Inc.
13-39	670-03703 - Lot 39	Colchester Bay Inc.
13-40	670-03703 - Lot 40	Colchester Bay Inc.
13-41	670-03703 - Lot 41	Colchester Bay Inc.
13-42	670-03703 - Lot 42	Colchester Bay Inc.
13-43	670-03703 - Lot 43	Colchester Bay Inc.
13-44	670-03703 - Lot 44	Colchester Bay Inc.
13-45	670-03703 - Lot 45	Colchester Bay Inc.
13-46	670-03703 - Lot 46	Colchester Bay Inc.
13-47	670-03703 - Lot 47	Colchester Bay Inc.
13-48	670-03703 - Lot 48	Colchester Bay Inc.
13-49	670-03703 - Lot 49	Colchester Bay Inc.
13-50	670-03703 - Lot 50	Colchester Bay Inc.
13-51	670-03703 - Lot 51	Colchester Bay Inc.
13-52	670-03703 - Lot 52	Colchester Bay Inc.
13-53	670-03703 - Lot 53	Colchester Bay Inc.
14	670-03900	Colchester Bay Inc.
15	670-04300	Stephen Forman & Jennifer Gagnon
16	670-04400	Stephen Forman & Jennifer Gagnon
17	670-04500	James & Lisa Martin
18	670-04600	Stephen Forman & Jennifer Gagnon
19	670-04700	Stephen Forman & Jennifer Gagnon
20	670-04800	Stephen & Clara Forman, Jennifer & Joey Gagnon
21	670-04900	Jamie Fecteau & Wendy Whitehead
22	670-05000	Thomas & Linda Gelinis
23	670-05100	Jamie Fecteau & Wendy Whitehead
24	670-05200	Stephen & Clara Forman, Jennifer & Joey Gagnon
25	670-05300	Kathy Pniowski Trustee
26	670-05900	Kathy Pniowski Trustee
27	670-07000	Julie & Gianni Battagin
28	670-07100	Paul Warburton & Kiki Kartano
29	670-07200	Thomas Welsh & Mary Martinello-Welsh
30	670-07302	Jose Francisco
31	670-07303	Maria Francisco
32	670-07400	Sherry Mena & Pablo Mena-Orostegui
33	670-07500	Bellecreef Beach Club Inc.

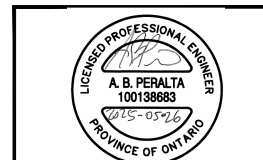


WATERSHED PLAN
 Scale = 1:5,000



THESE DRAWINGS HAVE BEEN REDUCED IN SIZE AND THE SCALE THEREFORE VARIES. FULL SCALE DRAWINGS CAN BE VIEWED AT THE MUNICIPAL OFFICES IF REQUIRED.

- DENOTES LANGLOIS-ARNER DRAINAGE SYSTEM ALIGNMENT
- DENOTES COLCHESTER HEIGHTS DRAINAGE SCHEME ALIGNMENT
- DENOTES OVERALL WATERSHED LIMITS
- DENOTES SUB-WATERSHED LIMITS
- DENOTES PARCEL IDENTIFICATION NUMBER
- DENOTES SURFACE DRAINAGE ONLY



N.J. Peralta Engineering Ltd.
 Consulting Engineers
 45 Division Street North
 Kingsville, ON
 N9Y 1E1 Canada
 P: 519-733-6587
 F: 519-733-6588
 peraltaengineering.com

DESIGNED BY: A.B.P.	DRAWN BY: D.N.P.	CHECKED BY: A.B.P.	PROJECT No: D22-147	SHEET No: 1 OF 1
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APPENDIX "E"

Future Maintenance Schedules of Assessment

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APPENDIX E-1

Future Maintenance Schedule
Langlois-Arner Drainage System – Entire Drain
(Station 0+000.0 to 1+818.1)

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MAINTENANCE SCHEDULE OF ASSESSMENT
Langlois-Arner Drainage System - Entire Drain (Station 0+000.0 to Station 1+818.1)

3. MUNICIPAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
		County Road 50		1.95	0.790	County of Essex	\$ 112.00	\$ 137.00	\$ 249.00	
		Street 'A'		2.68	1.085	Town of Essex	\$ 1,517.00	\$ 208.00	\$ 1,725.00	
Total on Municipal Lands.....								\$ 1,629.00	\$ 345.00	\$ 1,974.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
7	670-03400	1	Pt. Lot 90	1.19	0.482	Jose & Celeste Damaso	\$ 43.00	\$ 38.00	\$ 81.00	
8	670-03401	1	Pt. Lot 90	2.56	1.036	Denis & Jacqueline Lavigne	\$ 140.00	\$ 61.00	\$ 201.00	
9	670-03500	1	Pt. Lot 90	2.00	0.405	Dillon Beausoleil	\$ 75.00	\$ 27.00	\$ 102.00	
11	670-03700	1	Pt. Lot 90	0.95	0.384	Peter & Judy Berg	\$ 69.00	\$ 27.00	\$ 96.00	
12	670-03701	1	Pt. Lot 90	8.00	3.238	Gerald & Sherri Marontate & Susanne Poirier	\$ 4,532.00	\$ 174.00	\$ 4,706.00	
13-1	670-03703 - Lot 1	1	Pt. Lot 90	0.47	0.190	Colchester Bay Inc.	\$ 266.00	\$ 26.00	\$ 292.00	
13-2	670-03703 - Lot 2	1	Pt. Lot 90	0.26	0.107	Colchester Bay Inc.	\$ 150.00	\$ 15.00	\$ 165.00	
13-3	670-03703 - Lot 3	1	Pt. Lot 90	0.29	0.119	Colchester Bay Inc.	\$ 167.00	\$ 17.00	\$ 184.00	
13-4	670-03703 - Lot 4	1	Pt. Lot 90	0.23	0.092	Colchester Bay Inc.	\$ 129.00	\$ 13.00	\$ 142.00	
13-5	670-03703 - Lot 5	1	Pt. Lot 90	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00	
13-6	670-03703 - Lot 6	1	Pt. Lot 90	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00	
13-7	670-03703 - Lot 7	1	Pt. Lot 90	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00	
13-8	670-03703 - Lot 8	1	Pt. Lot 90	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00	
13-9	670-03703 - Lot 9	1	Pt. Lot 90	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00	
13-10	670-03703 - Lot 10	1	Pt. Lot 90	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00	
13-11	670-03703 - Lot 11	1	Pt. Lot 90	0.18	0.074	Colchester Bay Inc.	\$ 104.00	\$ 10.00	\$ 114.00	
13-12	670-03703 - Lot 12	1	Pt. Lot 90	0.28	0.115	Colchester Bay Inc.	\$ 161.00	\$ 16.00	\$ 177.00	
13-13	670-03703 - Lot 13	1	Pt. Lot 90	0.25	0.101	Colchester Bay Inc.	\$ 142.00	\$ 14.00	\$ 156.00	
13-14	670-03703 - Lot 14	1	Pt. Lot 90	0.23	0.091	Colchester Bay Inc.	\$ 128.00	\$ 13.00	\$ 141.00	
13-15	670-03703 - Lot 15	1	Pt. Lot 90	0.23	0.093	Colchester Bay Inc.	\$ 131.00	\$ 13.00	\$ 144.00	

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: *Continued*

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
13-16	670-03703 - Lot 16	1	Pt. Lot 90	0.23	0.23	0.094	Colchester Bay Inc.	\$ 132.00	\$ 13.00	\$ 145.00
13-17	670-03703 - Lot 17	1	Pt. Lot 90	0.31	0.31	0.126	Colchester Bay Inc.	\$ 176.00	\$ 17.00	\$ 193.00
13-18	670-03703 - Lot 18	1	Pt. Lot 90	0.51	0.51	0.206	Colchester Bay Inc.	\$ 288.00	\$ 29.00	\$ 317.00
13-19	670-03703 - Lot 19	1	Pt. Lot 90	0.90	0.90	0.363	Colchester Bay Inc.	\$ 508.00	\$ 50.00	\$ 558.00
13-20	670-03703 - Lot 20	1	Pt. Lot 90	0.48	0.48	0.193	Colchester Bay Inc.	\$ 271.00	\$ 27.00	\$ 298.00
13-21	670-03703 - Lot 21	1	Pt. Lot 90	0.23	0.23	0.093	Colchester Bay Inc.	\$ 131.00	\$ 13.00	\$ 144.00
13-22	670-03703 - Lot 22	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 93.00	\$ 9.00	\$ 102.00
13-23	670-03703 - Lot 23	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 93.00	\$ 9.00	\$ 102.00
13-24	670-03703 - Lot 24	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 94.00	\$ 9.00	\$ 103.00
13-25	670-03703 - Lot 25	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 94.00	\$ 9.00	\$ 103.00
13-26	670-03703 - Lot 26	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 94.00	\$ 9.00	\$ 103.00
13-27	670-03703 - Lot 27	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 94.00	\$ 9.00	\$ 103.00
13-28	670-03703 - Lot 28	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 94.00	\$ 9.00	\$ 103.00
13-29	670-03703 - Lot 29	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 94.00	\$ 9.00	\$ 103.00
13-30	670-03703 - Lot 30	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 94.00	\$ 9.00	\$ 103.00
13-31	670-03703 - Lot 31	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 94.00	\$ 9.00	\$ 103.00
13-32	670-03703 - Lot 32	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 94.00	\$ 9.00	\$ 103.00
13-33	670-03703 - Lot 33	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 94.00	\$ 9.00	\$ 103.00
13-34	670-03703 - Lot 34	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 94.00	\$ 9.00	\$ 103.00
13-35	670-03703 - Lot 35	1	Pt. Lot 90	0.31	0.31	0.124	Colchester Bay Inc.	\$ 174.00	\$ 17.00	\$ 191.00
13-36	670-03703 - Lot 36	1	Pt. Lot 90	0.19	0.19	0.078	Colchester Bay Inc.	\$ 109.00	\$ 11.00	\$ 120.00
13-37	670-03703 - Lot 37	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00
13-38	670-03703 - Lot 38	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00
13-39	670-03703 - Lot 39	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00
13-40	670-03703 - Lot 40	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00
13-41	670-03703 - Lot 41	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00
13-42	670-03703 - Lot 42	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00
13-43	670-03703 - Lot 43	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00
13-44	670-03703 - Lot 44	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00
13-45	670-03703 - Lot 45	1	Pt. Lot 90	0.21	0.21	0.084	Colchester Bay Inc.	\$ 118.00	\$ 12.00	\$ 130.00
13-46	670-03703 - Lot 46	1	Pt. Lot 90	0.21	0.21	0.084	Colchester Bay Inc.	\$ 117.00	\$ 12.00	\$ 129.00
13-47	670-03703 - Lot 47	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: *Continued*

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
13-48	670-03703 - Lot 48	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00
13-49	670-03703 - Lot 49	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00
13-50	670-03703 - Lot 50	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00
13-51	670-03703 - Lot 51	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 73.00	\$ 7.00	\$ 80.00
13-52	670-03703 - Lot 52	1	Pt. Lot 90	0.22	0.22	0.089	Colchester Bay Inc.	\$ 124.00	\$ 12.00	\$ 136.00
13-53	670-03703 - Lot 53	1	Pt. Lot 91	0.71	0.71	0.288	Colchester Bay Inc.	\$ 403.00	\$ 13.00	\$ 416.00
14	670-03900	Plan 1397	Lots 12 & 13	0.37	0.37	0.150	Dierdre Reavell, Alan & Marion Carriere, Glen Middelsteadt, Bradley, Kevin, Velma, Randall & Dennis Swarts	\$ 350.00	\$ 13.00	\$ 363.00
15	670-04300	Plan 1397	Pt. Lot 14	0.05	0.05	0.020	Stephen Forman & Jennifer Gagnon	\$ 350.00	\$ -	\$ 350.00
16	670-04400	Plan 1397	Pt. Lot 14	0.05	0.05	0.020	Stephen Forman & Jennifer Gagnon	\$ 350.00	\$ -	\$ 350.00
17	670-04500	Plan 1397	Pt. Lot 14	0.06	0.06	0.024	James & Lisa Martin	\$ 280.00	\$ -	\$ 280.00
18	670-04600	Plan 1397	Pt. Lot 14	0.01	0.01	0.004	Stephen Forman & Jennifer Gagnon	\$ 42.00	\$ -	\$ 42.00
19	670-04700	Plan 1397	Pt. Lot 14	0.01	0.01	0.004	Stephen Forman & Jennifer Gagnon	\$ 42.00	\$ -	\$ 42.00
20	670-04800	Plan 1397	Pt. Lot 15	0.01	0.01	0.004	Stephen & Clara Forman, Jennifer & Joey Gagnon	\$ 42.00	\$ -	\$ 42.00
21	670-04900	Plan 1397	Pt. Lot 15	0.01	0.01	0.004	Jamie Fecteau & Wendy Whitehead	\$ 42.00	\$ -	\$ 42.00
22	670-05000	Plan 1397	Pt. Lot 15	0.05	0.05	0.020	Thomas & Linda Gélinas	\$ 266.00	\$ -	\$ 266.00
23	670-05100	Plan 1397	Pt. Lot 15	0.04	0.04	0.016	Jamie Fecteau & Wendy Whitehead	\$ 350.00	\$ -	\$ 350.00
24	670-05200	Plan 1397	Pt. Lot 15	0.08	0.08	0.032	Stephen & Clara Forman, Jennifer & Joey Gagnon	\$ 350.00	\$ -	\$ 350.00
25	670-05300	Plan 1397	Pt. Lot 16	0.31	0.31	0.125	Kathy Pniewski Trustee	\$ 840.00	\$ 8.00	\$ 848.00
26	670-06900	Plan 1397	Lot 17 to 18	0.42	0.42	0.170	Kathy Pniewski Trustee	\$ 1,078.00	\$ -	\$ 1,078.00
27	670-07000	Plan 1397	Lot 19 to 21	0.74	0.74	0.299	Julie & Gianni Battagin	\$ 868.00	\$ -	\$ 868.00
28	670-07100	Plan 1397	Lot 22	0.20	0.20	0.081	Paul Warburton & Kiki Kartono	\$ 210.00	\$ -	\$ 210.00
29	670-07200	Plan 1397	Lot 23, Pt. Lot 24	0.26	0.26	0.105	Thomas Welsh & Mary Martinello-Welsh	\$ 168.00	\$ -	\$ 168.00
30	670-07302	Plan 1397	Lot 25	0.34	0.34	0.138	Jose Francisco	\$ 448.00	\$ -	\$ 448.00
31	670-07303	Plan 1397	Lot 26 & Pt. Lot 27	0.28	0.28	0.113	Maria Francisco	\$ 448.00	\$ -	\$ 448.00
32	670-07400	Plan 1397	Lot 28 & Lot 29	0.49	0.49	0.198	Sherry Mena & Pablo Mena-Orostegui	\$ 350.00	\$ -	\$ 350.00
33	670-07500	Plan 1397	Lots 30 to 32	0.67	0.67	0.271	Bellcreef Beach Club Inc.	\$ 560.00	\$ -	\$ 560.00
Total on Privately Owned - Non-Agricultural Lands.....								\$ 18,829.00	\$ 961.00	\$ 19,790.00

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
1	660-20900	1	Pt. Lots 88 & 89	139.43	105.00	42.493	Gorski Land Holdings Inc.	\$ 1,314.00	\$ 1,474.00	\$ 2,788.00
2	660-21001	1	Pt. Lot 87	56.50	25.00	10.117	Gorski Land Holdings Inc.	\$ 79.00	\$ 351.00	\$ 430.00
3	660-22450	1	Pt. Lot 87	54.07	54.07	21.882	Thomas Lypps	\$ 254.00	\$ 729.00	\$ 983.00
4	660-22700	1	Pt. Lots 88 & 89	95.19	20.00	8.094	Thomas Lypps	\$ 470.00	\$ 313.00	\$ 783.00
5	670-00100	1	Pt. Lots 90 & 91	139.60	12.30	4.978	Gorski Land Holdings Inc.	\$ 289.00	\$ 97.00	\$ 386.00
6	670-03300	1	Pt. Lot 90 & 91	89.80	43.80	17.726	Gorski Land Holdings Inc.	\$ 1,569.00	\$ 639.00	\$ 2,208.00
10	670-03600	1	Pt. Lot 90	17.72	11.66	4.719	Pleasure Beach Co-operative	\$ 467.00	\$ 191.00	\$ 658.00
Total on Privately Owned - Agricultural Lands (grantable)								\$ 4,442.00	\$ 3,794.00	\$ 8,236.00

TOTAL ASSESSMENT

306.14

\$ 24,900.00

\$ 5,100.00

\$ 30,000.00

1 Hectare = 2.471 Acres

APPENDIX E-2

Future Maintenance Schedule Langlois-Arner Drainage System – Downstream (Station 0+000.0 to 0+275.0)

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MAINTENANCE SCHEDULE OF ASSESSMENT
Langlois-Arner Drainage System - Downstream Portion (Station 0+000.0 to Station 0+275.0)

3. MUNICIPAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
		County Road 50		1.95	0.790		County of Essex	\$ 47.00	\$ 39.00	\$ 86.00
		Street 'A'		2.68	1.085		Town of Essex	\$ 639.00	\$ 54.00	\$ 693.00
Total on Municipal Lands.....								\$ 686.00	\$ 93.00	\$ 779.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
7	670-03400	1	Pt. Lot 90	1.19	0.482		Jose & Celeste Damaso	\$ -	\$ 11.00	\$ 11.00
8	670-03401	1	Pt. Lot 90	2.56	1.036		Denis & Jacqueline Lavigne	\$ -	\$ 17.00	\$ 17.00
9	670-03500	1	Pt. Lot 90	2.00	0.405		Dillon Beausoleil	\$ -	\$ 8.00	\$ 8.00
11	670-03700	1	Pt. Lot 90	0.95	0.384		Peter & Judy Berg	\$ -	\$ 8.00	\$ 8.00
12	670-03701	1	Pt. Lot 90	8.00	3.238		Gerald & Sherri Marontate & Susanne Poirier	\$ 1,921.00	\$ 50.00	\$ 1,971.00
13-1	670-03703 - Lot 1	1	Pt. Lot 90	0.47	0.190		Colchester Bay Inc.	\$ 113.00	\$ 8.00	\$ 121.00
13-2	670-03703 - Lot 2	1	Pt. Lot 90	0.26	0.107		Colchester Bay Inc.	\$ 63.00	\$ 4.00	\$ 67.00
13-3	670-03703 - Lot 3	1	Pt. Lot 90	0.29	0.119		Colchester Bay Inc.	\$ 71.00	\$ 5.00	\$ 76.00
13-4	670-03703 - Lot 4	1	Pt. Lot 90	0.23	0.092		Colchester Bay Inc.	\$ 54.00	\$ 4.00	\$ 58.00
13-5	670-03703 - Lot 5	1	Pt. Lot 90	0.13	0.052		Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-6	670-03703 - Lot 6	1	Pt. Lot 90	0.13	0.052		Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-7	670-03703 - Lot 7	1	Pt. Lot 90	0.13	0.052		Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-8	670-03703 - Lot 8	1	Pt. Lot 90	0.13	0.052		Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-9	670-03703 - Lot 9	1	Pt. Lot 90	0.13	0.052		Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-10	670-03703 - Lot 10	1	Pt. Lot 90	0.13	0.052		Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-11	670-03703 - Lot 11	1	Pt. Lot 90	0.18	0.074		Colchester Bay Inc.	\$ 44.00	\$ 3.00	\$ 47.00
13-12	670-03703 - Lot 12	1	Pt. Lot 90	0.28	0.115		Colchester Bay Inc.	\$ 68.00	\$ 5.00	\$ 73.00
13-13	670-03703 - Lot 13	1	Pt. Lot 90	0.25	0.101		Colchester Bay Inc.	\$ 60.00	\$ 4.00	\$ 64.00
13-14	670-03703 - Lot 14	1	Pt. Lot 90	0.23	0.091		Colchester Bay Inc.	\$ 54.00	\$ 4.00	\$ 58.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: Continued

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
13-15	670-03703 - Lot 15	1	Pt. Lot 90	0.23	0.23	0.093	Colchester Bay Inc.	\$ 55.00	\$ 4.00	\$ 59.00
13-16	670-03703 - Lot 16	1	Pt. Lot 90	0.23	0.23	0.094	Colchester Bay Inc.	\$ 56.00	\$ 4.00	\$ 60.00
13-17	670-03703 - Lot 17	1	Pt. Lot 90	0.31	0.31	0.126	Colchester Bay Inc.	\$ 75.00	\$ 5.00	\$ 80.00
13-18	670-03703 - Lot 18	1	Pt. Lot 90	0.51	0.51	0.206	Colchester Bay Inc.	\$ 122.00	\$ 8.00	\$ 130.00
13-19	670-03703 - Lot 19	1	Pt. Lot 90	0.90	0.90	0.363	Colchester Bay Inc.	\$ 215.00	\$ 15.00	\$ 230.00
13-20	670-03703 - Lot 20	1	Pt. Lot 90	0.48	0.48	0.193	Colchester Bay Inc.	\$ 115.00	\$ 8.00	\$ 123.00
13-21	670-03703 - Lot 21	1	Pt. Lot 90	0.23	0.23	0.093	Colchester Bay Inc.	\$ 55.00	\$ 4.00	\$ 59.00
13-22	670-03703 - Lot 22	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-23	670-03703 - Lot 23	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-24	670-03703 - Lot 24	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-25	670-03703 - Lot 25	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-26	670-03703 - Lot 26	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-27	670-03703 - Lot 27	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-28	670-03703 - Lot 28	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-29	670-03703 - Lot 29	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-30	670-03703 - Lot 30	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-31	670-03703 - Lot 31	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-32	670-03703 - Lot 32	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-33	670-03703 - Lot 33	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-34	670-03703 - Lot 34	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 40.00	\$ 3.00	\$ 43.00
13-35	670-03703 - Lot 35	1	Pt. Lot 90	0.31	0.31	0.124	Colchester Bay Inc.	\$ 74.00	\$ 5.00	\$ 79.00
13-36	670-03703 - Lot 36	1	Pt. Lot 90	0.19	0.19	0.078	Colchester Bay Inc.	\$ 46.00	\$ 3.00	\$ 49.00
13-37	670-03703 - Lot 37	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-38	670-03703 - Lot 38	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-39	670-03703 - Lot 39	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-40	670-03703 - Lot 40	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-41	670-03703 - Lot 41	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-42	670-03703 - Lot 42	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-43	670-03703 - Lot 43	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-44	670-03703 - Lot 44	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-45	670-03703 - Lot 45	1	Pt. Lot 90	0.21	0.21	0.084	Colchester Bay Inc.	\$ 50.00	\$ 3.00	\$ 53.00
13-46	670-03703 - Lot 46	1	Pt. Lot 90	0.21	0.21	0.084	Colchester Bay Inc.	\$ 50.00	\$ 3.00	\$ 53.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: Continued

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
13-47	670-03703 - Lot 47	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-48	670-03703 - Lot 48	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-49	670-03703 - Lot 49	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-50	670-03703 - Lot 50	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-51	670-03703 - Lot 51	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 31.00	\$ 2.00	\$ 33.00
13-52	670-03703 - Lot 52	1	Pt. Lot 90	0.22	0.22	0.089	Colchester Bay Inc.	\$ 53.00	\$ 4.00	\$ 57.00
13-53	670-03703 - Lot 53	1	Pt. Lot 91	0.71	0.71	0.288	Colchester Bay Inc.	\$ 171.00	\$ 4.00	\$ 175.00
14	670-03900	Plan 1397	Lots 12 & 13	0.37	0.37	0.150	Dierdre Reavell, Alan & Marion Carriere, Glen Middelsteadt, Bradley, Kevin, Velma, Randall & Dennis Swarts	\$ 148.00	\$ 4.00	\$ 152.00
15	670-04300	Plan 1397	Pt. Lot 14	0.05	0.05	0.020	Stephen Forman & Jennifer Gagnon	\$ 148.00	- \$	\$ 148.00
16	670-04400	Plan 1397	Pt. Lot 14	0.05	0.05	0.020	Stephen Forman & Jennifer Gagnon	\$ 148.00	- \$	\$ 148.00
17	670-04500	Plan 1397	Pt. Lot 14	0.06	0.06	0.024	James & Lisa Martin	\$ 119.00	- \$	\$ 119.00
18	670-04600	Plan 1397	Pt. Lot 14	0.01	0.01	0.004	Stephen Forman & Jennifer Gagnon	\$ 18.00	- \$	\$ 18.00
19	670-04700	Plan 1397	Pt. Lot 14	0.01	0.01	0.004	Stephen Forman & Jennifer Gagnon	\$ 18.00	- \$	\$ 18.00
20	670-04800	Plan 1397	Pt. Lot 15	0.01	0.01	0.004	Stephen & Clara Forman, Jennifer & Joey Gagnon	\$ 18.00	- \$	\$ 18.00
21	670-04900	Plan 1397	Pt. Lot 15	0.01	0.01	0.004	Jamie Fecteau & Wendy Whitehead	\$ 18.00	- \$	\$ 18.00
22	670-05000	Plan 1397	Pt. Lot 15	0.05	0.05	0.020	Thomas & Linda Gelinias	\$ 113.00	- \$	\$ 113.00
23	670-05100	Plan 1397	Pt. Lot 15	0.04	0.04	0.016	Jamie Fecteau & Wendy Whitehead	\$ 148.00	- \$	\$ 148.00
24	670-05200	Plan 1397	Pt. Lot 15	0.08	0.08	0.032	Stephen & Clara Forman, Jennifer & Joey Gagnon	\$ 148.00	- \$	\$ 148.00
25	670-05300	Plan 1397	Pt. Lot 16	0.31	0.31	0.125	Kathy Pniewski Trustee	\$ 356.00	\$ 2.00	\$ 358.00
26	670-06900	Plan 1397	Lot 17 to 18	0.42	0.42	0.170	Kathy Pniewski Trustee	\$ 457.00	- \$	\$ 457.00
27	670-07000	Plan 1397	Lot 19 to 21	0.74	0.74	0.299	Julie & Gianni Battagin	\$ 368.00	- \$	\$ 368.00
28	670-07100	Plan 1397	Lot 22	0.20	0.20	0.081	Paul Warburton & Kiki Kartono	\$ 89.00	- \$	\$ 89.00
29	670-07200	Plan 1397	Lot 23, Pt. Lot 24	0.26	0.26	0.105	Thomas Welsh & Mary Martinello-Welsh	\$ 71.00	- \$	\$ 71.00
30	670-07302	Plan 1397	Lot 25	0.34	0.34	0.138	Jose Francisco	\$ 190.00	- \$	\$ 190.00
31	670-07303	Plan 1397	Lot 26 & Pt. Lot 27	0.28	0.28	0.113	Maria Francisco	\$ 190.00	- \$	\$ 190.00
32	670-07400	Plan 1397	Lot 28 & Lot 29	0.49	0.49	0.198	Sherry Mena & Pablo Mena-Orostegui	\$ 148.00	- \$	\$ 148.00
33	670-07500	Plan 1397	Lots 30 to 32	0.67	0.67	0.271	Bellcreek Beach Club Inc.	\$ 237.00	- \$	\$ 237.00
Total on Privately Owned - Non-Agricultural Lands								\$ 7,844.00	\$ 284.00	\$ 8,128.00

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
1	660-20900	1	Pt. Lots 88 & 89	139.43	105.00	42.493	Gorski Land Holdings Inc.	\$ -	\$ 425.00	\$ 425.00
2	660-21001	1	Pt. Lot 87	56.50	25.00	10.117	Gorski Land Holdings Inc.	\$ -	\$ 101.00	\$ 101.00
3	660-22450	1	Pt. Lot 87	54.07	54.07	21.882	Thomas Lypps	\$ -	\$ 210.00	\$ 210.00
4	660-22700	1	Pt. Lots 88 & 89	95.19	20.00	8.094	Thomas Lypps	\$ -	\$ 90.00	\$ 90.00
5	670-00100	1	Pt. Lots 90 & 91	139.60	12.30	4.978	Gorski Land Holdings Inc.	\$ -	\$ 28.00	\$ 28.00
6	670-03300	1	Pt. Lot 90 & 91	89.80	43.80	17.726	Gorski Land Holdings Inc.	\$ -	\$ 184.00	\$ 184.00
10	670-03600	1	Pt. Lot 90	17.72	11.66	4.719	Pleasure Beach Co-operative	\$ -	\$ 55.00	\$ 55.00
Total on Privately Owned - Agricultural Lands (grantable)								\$ -	\$ 1,093.00	\$ 1,093.00
TOTAL ASSESSMENT					306.14	123.895		\$ 8,530.00	\$ 1,470.00	\$ 10,000.00

1 Hectare = 2.471 Acres

APPENDIX E-3

Future Maintenance Schedule Langlois-Arner Drainage System – Upstream (Station 0+275.0 to 1+818.1)

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MAINTENANCE SCHEDULE OF ASSESSMENT
Langlois- Arner Drainage System - Upstream Portion (Station 0+275.0 to Station 1+818.1)

3. MUNICIPAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
		County Road 50		1.95	0.790		County of Essex	\$ 276.00	\$ 207.00	\$ 483.00
Total on Municipal Lands.....								\$ 276.00	\$ 207.00	\$ 483.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
7	670-03400	1	Pt. Lot 90	1.19	1.19	0.482	Jose & Celeste Damaso	\$ 71.00	\$ 26.00	\$ 97.00
8	670-03401	1	Pt. Lot 90	2.56	2.56	1.036	Denis & Jacqueline Lavigne	\$ 231.00	\$ 41.00	\$ 272.00
9	670-03500	1	Pt. Lot 90	2.00	1.00	0.405	Dillon Beausoleil	\$ 123.00	\$ 18.00	\$ 141.00
11	670-03700	1	Pt. Lot 90	0.95	0.95	0.384	Peter & Judy Berg	\$ 114.00	\$ 19.00	\$ 133.00
12	670-03701	1	Pt. Lot 90	8.00	2.00	0.809	Gerald & Sherri Marontate & Susanne Poirier	\$ 17.00	\$ 37.00	\$ 54.00
Total on Privately Owned - Non-Agricultural Lands.....								\$ 556.00	\$ 141.00	\$ 697.00

5. PRIVATELY OWNED - AGRICULTURAL LANDS (grantable):

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
1	660-20900	1	Pt. Lots 88 & 89	139.43	105.00	42.493	Gorski Land Holdings Inc.	\$ 2,176.00	\$ 537.00	\$ 2,713.00
2	660-21001	1	Pt. Lot 87	56.50	25.00	10.117	Gorski Land Holdings Inc.	\$ 131.00	\$ 104.00	\$ 235.00
3	660-22450	1	Pt. Lot 87	54.07	54.07	21.882	Thomas Lypps	\$ 421.00	\$ 334.00	\$ 755.00
4	660-22700	1	Pt. Lots 88 & 89	95.19	20.00	8.094	Thomas Lypps	\$ 779.00	\$ 158.00	\$ 937.00
5	670-00100	1	Pt. Lots 90 & 91	139.60	12.30	4.978	Gorski Land Holdings Inc.	\$ 479.00	\$ 39.00	\$ 518.00
6	670-03300	1	Pt. Lot 90 & 91	89.80	43.80	17.726	Gorski Land Holdings Inc.	\$ 2,598.00	\$ 224.00	\$ 2,822.00
10	670-03600	1	Pt. Lot 90	17.72	11.66	4.719	Pleasure Beach Co-operative	\$ 774.00	\$ 66.00	\$ 840.00
Total on Privately Owned - Agricultural Lands (grantable).....								\$ 7,358.00	\$ 1,462.00	\$ 8,820.00

TOTAL ASSESSMENT

				281.48	113.914			\$ 8,190.00	\$ 1,810.00	\$ 10,000.00
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1 Hectare = 2.471 Acres

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APPENDIX E-4

Future Maintenance Schedule
Colchester Heights Drainage Scheme
Colchester Heights Drain
(Station 1+057.0 to 1+300.6)

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MAINTENANCE SCHEDULE OF ASSESSMENT
Colchester Heights Drainage Scheme - Colchester Heights Drain (Station 1+057.0 to Station 1+300.6)

3. MUNICIPAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
			Street 'A'	2.68	1.085		Town of Essex	\$ 2,339.00	\$ 1,328.00	\$ 3,667.00
Total on Municipal Lands.....								\$ 2,339.00	\$ 1,328.00	\$ 3,667.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
13-1	670-03703 - Lot 1	1	Pt. Lot 90	0.47	0.47	0.190	Colchester Bay Inc.	\$ 186.00	\$ 175.00	\$ 361.00
13-2	670-03703 - Lot 2	1	Pt. Lot 90	0.26	0.26	0.107	Colchester Bay Inc.	\$ 104.00	\$ 98.00	\$ 202.00
13-3	670-03703 - Lot 3	1	Pt. Lot 90	0.29	0.29	0.119	Colchester Bay Inc.	-	\$ 109.00	\$ 109.00
13-4	670-03703 - Lot 4	1	Pt. Lot 90	0.23	0.23	0.092	Colchester Bay Inc.	-	\$ 85.00	\$ 85.00
13-5	670-03703 - Lot 5	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	-	\$ 48.00	\$ 48.00
13-6	670-03703 - Lot 6	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	-	\$ 48.00	\$ 48.00
13-7	670-03703 - Lot 7	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	-	\$ 48.00	\$ 48.00
13-8	670-03703 - Lot 8	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	-	\$ 48.00	\$ 48.00
13-9	670-03703 - Lot 9	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	-	\$ 48.00	\$ 48.00
13-10	670-03703 - Lot 10	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	-	\$ 48.00	\$ 48.00
13-11	670-03703 - Lot 11	1	Pt. Lot 90	0.18	0.18	0.074	Colchester Bay Inc.	-	\$ 69.00	\$ 69.00
13-12	670-03703 - Lot 12	1	Pt. Lot 90	0.28	0.23	0.091	Colchester Bay Inc.	-	\$ 84.00	\$ 84.00
13-13	670-03703 - Lot 13	1	Pt. Lot 90	0.25	0.17	0.069	Colchester Bay Inc.	-	\$ 64.00	\$ 64.00
13-14	670-03703 - Lot 14	1	Pt. Lot 90	0.23	0.16	0.063	Colchester Bay Inc.	-	\$ 58.00	\$ 58.00
13-15	670-03703 - Lot 15	1	Pt. Lot 90	0.23	0.16	0.063	Colchester Bay Inc.	-	\$ 58.00	\$ 58.00
13-16	670-03703 - Lot 16	1	Pt. Lot 90	0.23	0.16	0.063	Colchester Bay Inc.	-	\$ 58.00	\$ 58.00
13-17	670-03703 - Lot 17	1	Pt. Lot 90	0.31	0.20	0.080	Colchester Bay Inc.	-	\$ 74.00	\$ 74.00
13-18	670-03703 - Lot 18	1	Pt. Lot 90	0.51	0.27	0.110	Colchester Bay Inc.	\$ 108.00	\$ 101.00	\$ 209.00
13-19	670-03703 - Lot 19	1	Pt. Lot 90	0.90	0.40	0.162	Colchester Bay Inc.	\$ 159.00	\$ 149.00	\$ 308.00
13-20	670-03703 - Lot 20	1	Pt. Lot 90	0.48	0.48	0.193	Colchester Bay Inc.	\$ 189.00	\$ 178.00	\$ 367.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: *Continued*

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
13-21	670-03703 - Lot 21	1	Pt. Lot 90	0.23	0.23	0.093	Colchester Bay Inc.	\$ 91.00	\$ 86.00	\$ 177.00
13-22	670-03703 - Lot 22	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 65.00	\$ 61.00	\$ 126.00
13-23	670-03703 - Lot 23	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 65.00	\$ 61.00	\$ 126.00
13-24	670-03703 - Lot 24	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 66.00	\$ 62.00	\$ 128.00
13-25	670-03703 - Lot 25	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 66.00	\$ 62.00	\$ 128.00
13-26	670-03703 - Lot 26	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 66.00	\$ 62.00	\$ 128.00
13-27	670-03703 - Lot 27	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 66.00	\$ 62.00	\$ 128.00
13-28	670-03703 - Lot 28	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 66.00	\$ 62.00	\$ 128.00
13-29	670-03703 - Lot 29	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 66.00	\$ 62.00	\$ 128.00
13-30	670-03703 - Lot 30	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 66.00	\$ 62.00	\$ 128.00
13-31	670-03703 - Lot 31	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 66.00	\$ 62.00	\$ 128.00
13-32	670-03703 - Lot 32	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 66.00	\$ 62.00	\$ 128.00
13-33	670-03703 - Lot 33	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 66.00	\$ 62.00	\$ 128.00
13-34	670-03703 - Lot 34	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ 66.00	\$ 62.00	\$ 128.00
13-35	670-03703 - Lot 35	1	Pt. Lot 90	0.31	0.31	0.124	Colchester Bay Inc.	\$ 121.00	\$ 114.00	\$ 235.00
13-36	670-03703 - Lot 36	1	Pt. Lot 90	0.19	0.19	0.078	Colchester Bay Inc.	\$ 76.00	\$ 72.00	\$ 148.00
13-37	670-03703 - Lot 37	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 51.00	\$ 48.00	\$ 99.00
13-38	670-03703 - Lot 38	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 51.00	\$ 48.00	\$ 99.00
13-39	670-03703 - Lot 39	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 51.00	\$ 48.00	\$ 99.00
13-40	670-03703 - Lot 40	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 51.00	\$ 48.00	\$ 99.00
13-41	670-03703 - Lot 41	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 51.00	\$ 48.00	\$ 99.00
13-42	670-03703 - Lot 42	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 51.00	\$ 48.00	\$ 99.00
13-43	670-03703 - Lot 43	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 51.00	\$ 48.00	\$ 99.00
13-44	670-03703 - Lot 44	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 51.00	\$ 48.00	\$ 99.00
13-45	670-03703 - Lot 45	1	Pt. Lot 90	0.21	0.21	0.084	Colchester Bay Inc.	\$ 82.00	\$ 77.00	\$ 159.00
13-46	670-03703 - Lot 46	1	Pt. Lot 90	0.21	0.21	0.084	Colchester Bay Inc.	-	\$ 77.00	\$ 77.00
13-47	670-03703 - Lot 47	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	-	\$ 48.00	\$ 48.00
13-48	670-03703 - Lot 48	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	-	\$ 48.00	\$ 48.00
13-49	670-03703 - Lot 49	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	-	\$ 48.00	\$ 48.00
13-50	670-03703 - Lot 50	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	-	\$ 48.00	\$ 48.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: *Continued*

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
13-51	670-03703 - Lot 51	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-52	670-03703 - Lot 52	1	Pt. Lot 90	0.22	0.22	0.089	Colchester Bay Inc.	\$ -	\$ 82.00	\$ 82.00
13-53	670-03703 - Lot 53	1	Pt. Lot 91	0.71	0.71	0.288	Colchester Bay Inc.	\$ 281.00	\$ 88.00	\$ 369.00
Total on Privately Owned - Non-Agricultural Lands.....								\$ 2,661.00	\$ 3,672.00	\$ 6,333.00
TOTAL ASSESSMENT				13.01	5.264			\$ 5,000.00	\$ 5,000.00	\$ 10,000.00

1 Hectare = 2.471 Acres

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APPENDIX E-5

Future Maintenance Schedule Colchester Heights Drainage Scheme – Branch (Station 1+300.6 to 1+500.9)

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MAINTENANCE SCHEDULE OF ASSESSMENT
Colchester Heights Drainage Scheme - Branch Drain (Station 1+300.6 to Station 1+500.9)

3. MUNICIPAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
			Street 'A'	1.20	0.486		Town of Essex	\$ 1,430.00	\$ 772.00	\$ 2,202.00
Total on Municipal Lands.....								\$ 1,430.00	\$ 772.00	\$ 2,202.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
13-3	670-03703 - Lot 3	1	Pt. Lot 90	0.29	0.29	0.119	Colchester Bay Inc.	\$ 87.00	\$ 141.00	\$ 228.00
13-4	670-03703 - Lot 4	1	Pt. Lot 90	0.23	0.23	0.092	Colchester Bay Inc.	\$ 68.00	\$ 109.00	\$ 177.00
13-5	670-03703 - Lot 5	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 38.00	\$ 61.00	\$ 99.00
13-6	670-03703 - Lot 6	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 38.00	\$ 61.00	\$ 99.00
13-7	670-03703 - Lot 7	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 38.00	\$ 61.00	\$ 99.00
13-8	670-03703 - Lot 8	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 38.00	\$ 61.00	\$ 99.00
13-9	670-03703 - Lot 9	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 38.00	\$ 61.00	\$ 99.00
13-10	670-03703 - Lot 10	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 38.00	\$ 61.00	\$ 99.00
13-11	670-03703 - Lot 11	1	Pt. Lot 90	0.18	0.18	0.074	Colchester Bay Inc.	\$ 55.00	\$ 88.00	\$ 143.00
13-12	670-03703 - Lot 12	1	Pt. Lot 90	0.28	0.23	0.091	Colchester Bay Inc.	\$ 67.00	\$ 108.00	\$ 175.00
13-13	670-03703 - Lot 13	1	Pt. Lot 90	0.25	0.17	0.069	Colchester Bay Inc.	\$ 51.00	\$ 82.00	\$ 133.00
13-14	670-03703 - Lot 14	1	Pt. Lot 90	0.23	0.16	0.063	Colchester Bay Inc.	\$ 46.00	\$ 75.00	\$ 121.00
13-15	670-03703 - Lot 15	1	Pt. Lot 90	0.23	0.16	0.063	Colchester Bay Inc.	\$ 46.00	\$ 75.00	\$ 121.00
13-16	670-03703 - Lot 16	1	Pt. Lot 90	0.23	0.16	0.063	Colchester Bay Inc.	\$ 46.00	\$ 75.00	\$ 121.00
13-17	670-03703 - Lot 17	1	Pt. Lot 90	0.31	0.20	0.080	Colchester Bay Inc.	\$ 59.00	\$ 95.00	\$ 154.00
13-46	670-03703 - Lot 46	1	Pt. Lot 90	0.21	0.21	0.084	Colchester Bay Inc.	\$ 62.00	\$ 99.00	\$ 161.00
13-47	670-03703 - Lot 47	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 38.00	\$ 62.00	\$ 100.00
13-48	670-03703 - Lot 48	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 38.00	\$ 62.00	\$ 100.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: *Continued*

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
13-49	670-03703 - Lot 49	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 38.00	\$ 62.00	\$ 100.00
13-50	670-03703 - Lot 50	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 38.00	\$ 62.00	\$ 100.00
13-51	670-03703 - Lot 51	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ 38.00	\$ 62.00	\$ 100.00
13-52	670-03703 - Lot 52	1	Pt. Lot 90	0.22	0.22	0.089	Colchester Bay Inc.	\$ 65.00	\$ 105.00	\$ 170.00
Total on Privately Owned - Non-Agricultural Lands.....								\$ 1,070.00	\$ 1,728.00	\$ 2,798.00
TOTAL ASSESSMENT					4.81	1.945		\$ 2,500.00	\$ 2,500.00	\$ 5,000.00

1 Hectare = 2.471 Acres

APPENDIX E-6

Future Maintenance Schedule Colchester Heights Drainage Scheme - Outlet (Station 2+086.0 to 2+140.0)

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MAINTENANCE SCHEDULE OF ASSESSMENT
Colchester Heights Drainage Scheme - Outlet Portion (Station 2+086.0 to Station 2+140.0)

3. MUNICIPAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
		Street 'A'		2.68	1.085	Town of Essex	\$ 2,760.00	\$ 1,328.00	\$ 4,088.00	
Total on Municipal Lands.....								\$ 2,760.00	\$ 1,328.00	\$ 4,088.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS:

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
13-1	670-03703 - Lot 1	1	Pt. Lot 90	0.47	0.190	0.190	Colchester Bay Inc.	\$ -	\$ 175.00	\$ 175.00
13-2	670-03703 - Lot 2	1	Pt. Lot 90	0.26	0.107	0.107	Colchester Bay Inc.	\$ -	\$ 98.00	\$ 98.00
13-3	670-03703 - Lot 3	1	Pt. Lot 90	0.29	0.119	0.119	Colchester Bay Inc.	\$ -	\$ 109.00	\$ 109.00
13-4	670-03703 - Lot 4	1	Pt. Lot 90	0.23	0.092	0.092	Colchester Bay Inc.	\$ -	\$ 85.00	\$ 85.00
13-5	670-03703 - Lot 5	1	Pt. Lot 90	0.13	0.052	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-6	670-03703 - Lot 6	1	Pt. Lot 90	0.13	0.052	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-7	670-03703 - Lot 7	1	Pt. Lot 90	0.13	0.052	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-8	670-03703 - Lot 8	1	Pt. Lot 90	0.13	0.052	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-9	670-03703 - Lot 9	1	Pt. Lot 90	0.13	0.052	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-10	670-03703 - Lot 10	1	Pt. Lot 90	0.13	0.052	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-11	670-03703 - Lot 11	1	Pt. Lot 90	0.18	0.074	0.074	Colchester Bay Inc.	\$ -	\$ 69.00	\$ 69.00
13-12	670-03703 - Lot 12	1	Pt. Lot 90	0.28	0.091	0.091	Colchester Bay Inc.	\$ -	\$ 84.00	\$ 84.00
13-13	670-03703 - Lot 13	1	Pt. Lot 90	0.25	0.17	0.069	Colchester Bay Inc.	\$ -	\$ 64.00	\$ 64.00
13-14	670-03703 - Lot 14	1	Pt. Lot 90	0.23	0.16	0.063	Colchester Bay Inc.	\$ -	\$ 58.00	\$ 58.00
13-15	670-03703 - Lot 15	1	Pt. Lot 90	0.23	0.16	0.063	Colchester Bay Inc.	\$ -	\$ 58.00	\$ 58.00
13-16	670-03703 - Lot 16	1	Pt. Lot 90	0.23	0.16	0.063	Colchester Bay Inc.	\$ -	\$ 58.00	\$ 58.00
13-17	670-03703 - Lot 17	1	Pt. Lot 90	0.31	0.20	0.080	Colchester Bay Inc.	\$ 1,120.00	\$ 74.00	\$ 1,194.00
13-18	670-03703 - Lot 18	1	Pt. Lot 90	0.51	0.27	0.110	Colchester Bay Inc.	\$ 1,120.00	\$ 101.00	\$ 1,221.00
13-19	670-03703 - Lot 19	1	Pt. Lot 90	0.90	0.40	0.162	Colchester Bay Inc.	\$ -	\$ 149.00	\$ 149.00
13-20	670-03703 - Lot 20	1	Pt. Lot 90	0.48	0.48	0.193	Colchester Bay Inc.	\$ -	\$ 178.00	\$ 178.00
13-21	670-03703 - Lot 21	1	Pt. Lot 90	0.23	0.23	0.093	Colchester Bay Inc.	\$ -	\$ 86.00	\$ 86.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: *Continued*

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
13-22	670-03703 - Lot 22	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 61.00	\$ 61.00
13-23	670-03703 - Lot 23	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 61.00	\$ 61.00
13-24	670-03703 - Lot 24	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 62.00	\$ 62.00
13-25	670-03703 - Lot 25	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 62.00	\$ 62.00
13-26	670-03703 - Lot 26	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 62.00	\$ 62.00
13-27	670-03703 - Lot 27	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 62.00	\$ 62.00
13-28	670-03703 - Lot 28	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 62.00	\$ 62.00
13-29	670-03703 - Lot 29	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 62.00	\$ 62.00
13-30	670-03703 - Lot 30	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 62.00	\$ 62.00
13-31	670-03703 - Lot 31	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 62.00	\$ 62.00
13-32	670-03703 - Lot 32	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 62.00	\$ 62.00
13-33	670-03703 - Lot 33	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 62.00	\$ 62.00
13-34	670-03703 - Lot 34	1	Pt. Lot 90	0.17	0.17	0.067	Colchester Bay Inc.	\$ -	\$ 62.00	\$ 62.00
13-35	670-03703 - Lot 35	1	Pt. Lot 90	0.31	0.31	0.124	Colchester Bay Inc.	\$ -	\$ 114.00	\$ 114.00
13-36	670-03703 - Lot 36	1	Pt. Lot 90	0.19	0.19	0.078	Colchester Bay Inc.	\$ -	\$ 72.00	\$ 72.00
13-37	670-03703 - Lot 37	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-38	670-03703 - Lot 38	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-39	670-03703 - Lot 39	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-40	670-03703 - Lot 40	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-41	670-03703 - Lot 41	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-42	670-03703 - Lot 42	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-43	670-03703 - Lot 43	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-44	670-03703 - Lot 44	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-45	670-03703 - Lot 45	1	Pt. Lot 90	0.21	0.21	0.084	Colchester Bay Inc.	\$ -	\$ 77.00	\$ 77.00
13-46	670-03703 - Lot 46	1	Pt. Lot 90	0.21	0.21	0.084	Colchester Bay Inc.	\$ -	\$ 77.00	\$ 77.00
13-47	670-03703 - Lot 47	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-48	670-03703 - Lot 48	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-49	670-03703 - Lot 49	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-50	670-03703 - Lot 50	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00

4. PRIVATELY OWNED - NON-AGRICULTURAL LANDS: *Continued*

Parcel ID Number	Tax Roll Number	Con. or Plan Number	Lot or Part of Lot	Acres Owned	Acres Affected	Hectares Affected	Owner's Name	Value of Benefit	Value of Outlet	TOTAL VALUE
13-51	670-03703 - Lot 51	1	Pt. Lot 90	0.13	0.13	0.052	Colchester Bay Inc.	\$ -	\$ 48.00	\$ 48.00
13-52	670-03703 - Lot 52	1	Pt. Lot 90	0.22	0.22	0.089	Colchester Bay Inc.	\$ -	\$ 82.00	\$ 82.00
13-53	670-03703 - Lot 53	1	Pt. Lot 91	0.71	0.71	0.288	Colchester Bay Inc.	\$ -	\$ 88.00	\$ 88.00
Total on Privately Owned - Non-Agricultural Lands.....								\$ 2,240.00	\$ 3,672.00	\$ 5,912.00
TOTAL ASSESSMENT								\$ 5,000.00	\$ 5,000.00	\$ 10,000.00

1 Hectare = 2.471 Acres

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