THIS AGREEMENT made this _____day _____ of 2025

BETWEEN:

2627781 ONTARIO INC., BBFC HOLDINGS INC. AND 2585908 ONTARIO INC.
(hereinafter collectively called the "**Participating Landowner Group**" or "**PLG**")
OF THE FIRST PART;

- and-

BRIDGEBURG LANDOWNERS GROUP INC.
(hereinafter called the "**Trustee**")
OF THE SECOND PART;

- and-

THE CORPORATION OF THE
TOWN OF FORT ERIE
(hereinafter called the "**Town**")
OF THE THIRD PART

WHEREAS the PLG owns lands located within the area bounded to the north and east by the Niagara River, to the south by the existing community of Bridgeburg, and to the west by Thompson Road (the "**Bridgeburg North Secondary Plan Area**") in the Town of Fort Erie (the "**Town**"), in the Regional Municipality of Niagara (the "**Region**"), as shown on the attached Schedule "A";

AND WHEREAS the PLG wishes to develop its lands for residential and other uses;

AND WHEREAS the PLG lands are predominantly designated "Urban Residential Area", "Low Density Residential Area", "Environmental Protection Area" and "Open Space Area" in the Town's Official Plan;

AND WHEREAS the policies contained in the Town's Official Plan as amended, require among other things, that a secondary plan for the Bridgeburg North Secondary Plan Area (the "**Secondary Plan**") be completed prior to the development of the PLG's lands;

AND WHEREAS the Town's does not have Budget for the Secondary Plan.

AND WHEREAS the PLG has agreed to front-end the cost of the Secondary Plan and related background studies upon the terms contained in this Agreement, which costs shall be reimbursed in accordance with this Agreement;

AND WHEREAS the PLG and the Town wish to establish an understanding of the obligations for the process for the preparation of the Secondary Plan (the "**Secondary Plan Process**")

NOW, THEREFORE, in consideration of the sum of TEN DOLLARS ($10.00) now paid by each of the parties hereto to the other (the receipt and adequacy of which are hereby acknowledged), and for other good and valuable consideration, THE PARTIES HERETO COVENANT AND AGREE AS FOLLOWS:

Estimated Staff Costs re: the Secondary Plan Process (Excluding Related Background Studies)

1. The parties acknowledge that the Town has estimated the cost of staff related to the Secondary Plan Process (the "**Staff Costs**"), excluding the related background studies, to be $160,000.00 per 12-month period. This amount reflects the costs of monitoring of the Secondary Plan Process and review of the Background Studies (as hereinafter defined) by the Town's contract staff and the coordination and processing of the Secondary Plan by other internal Town staff.

2. Immediately upon execution of this Agreement and prior to the solicitation of bids or other expressions of interest as contemplated by Section 4 below, the PLG shall pay $160,000 towards the Staff Costs to the Town. The Parties agree that this payment represents a contribution of 100% of the estimated Town Staff Costs per 12-month period, and any further payments shall be subject to paragraph 14 hereinbelow.

3. It is agreed that, following the execution of this Agreement, the Town may proceed with the normal staff hiring process for a contract position (as aforesaid) in respect of the Secondary Plan in such manner as the Town, in its sole discretion sees fit.

4. The parties agree that the background studies related to the Secondary Plan (the "**Background Studies**") are to be scoped by the Town in consultation with the Region and Conservation Authority and the PLG. The PLG will engage their own qualified consultant(s) to undertake said Background Studies. For the purposes of this Agreement, the Town has established that the Background Studies required for the approval of the Secondary Plan shall be carried out in accordance with terms of reference attached hereto as Schedule "B", which may be amended at the discretion of the Director, Planning, Building and By-law Services.

5. The parties further agree that all costs involved with undertaking said Background Studies (the "**Background Study Costs**") shall be financed by the PLG subject to reimbursement as set out in this Agreement. The parties acknowledge that the Town has estimated the Background Study Costs to be $675,000.00.

6. The Town agrees to reimburse the PLG (via the Trustee) the actual Secondary Plan Background Study Costs paid/incurred by the PLG (as confirmed by the Trustee in writing to the Town), without interest, in the form of monetary payment, to be paid by the Town to the Trustee by no later than one (1) year following the date of final approval (i.e. adoption by the Town) of the Secondary Plan.

    a) The amount reimbursed is to be the lesser of the actual cost as confirmed by Director, Planning, Building and By-law Services and the cost included in the Development Charge Background Study for the Development-Related Studies which is to be increased at a rate commensurate with the Town's Development Charge rate indexing provisions.

7. Following the commencement of work on the Secondary Plan, should additional work or additional and/or unexpected expenses become necessary and/or arise, any of which would result in the total Secondary Plan Process Costs exceeding the estimated amount

set out herein, the Town's Director, Planning, Building and By-law Services shall obtain an estimate of any additional costs arising from the same (the "**Additional Costs**"), and notify the PLG (via the Trustee) of the Additional Costs. Within thirty (30) days thereafter, the PLG (via the Trustee), shall notify the Town that:

a) the PLG agrees to fund the Additional Costs. In such case the terms of this Agreement (including without limitation, with respect to reimbursement thereof) shall apply to such Additional Costs with necessary modifications; or

b) the PLG objects to the Additional Costs. Following receipt of such notice from the Trustee, the Town shall, in its sole and absolute discretion, determine whether to assume responsibility for funding of such Additional Costs. The terms of this Agreement shall not apply in any respect of any such Additional Costs undertaken or funded by the Town in accordance with this subsection.

Payments

8. Any payment made to the Town by the PLG pursuant to this agreement shall be in the form of a cash deposit.

9. The Town may draw down the funds provided under Section 1 from time to time to pay the Staff Costs. The Town shall provide the Trustee with copies of any invoices to be reimbursed using the said cash deposit, no later than fifteen (15) days prior to the proposed payment thereof.

10. Prior to any work on the Secondary Plan being commenced or continued, cash deposits in the total amounts required under this Agreement on account of the Staff/Study Costs must be received by the Town and must have been deemed satisfactory by the Town Treasurer.

11. As work on the Secondary Plan proceeds, the Town shall draw down the PLG's cash deposit in the amount of any Staff Costs incurred in association with such work (including the cost of any administrative fees required to draw down the same). The Town shall provide the Trustee with no less than fifteen (15) days prior written notice (together with supporting invoices) prior to any such draw-down.

Preparation and Completion of Secondary Plan excluding related Background Studies

12. The preparation of the Secondary Plan excluding the related Background Studies shall be undertaken under the Town's sole direction using such resources, including Town staff as the Town may see fit, in its sole discretion. The PLG acknowledges and agrees that nothing in this agreement shall fetter the discretion of Town Council in considering any matter which may come before it in connection with the Secondary Plan, or any application made by the PLG under the *Planning Act* or any other legislation.

13. The Town estimates that the Secondary Plan shall be adopted by Town council by the end of 2026.

14. The PLG is willing to provide $160,000 per 12-month period (inclusive of all applicable costs), until December 31, 2026, to the Town to hire a contract position to expedite the adoption of the Secondary Plan earlier than the end of 2026. This is to be paid to the Town

by PLG in advance of posting the position and the position is to be filled through the Town's normal staff hiring process for contract positions. Any extension to the contract would be prorated per month until the adoption of the Secondary Plan provided that:

a) in the event the contract position, at any time, remains vacant for a period of thirty (30) days or more, the PLG shall not be responsible to pay the pro-rated amount for the period(s) of such vacancy; and

b) in the event that the contract position is extended (or anticipated to be extended) beyond December 31, 2026, the Town shall notify the PLG, via the Trustee, as to the anticipated Staff Costs to be incurred after such date (the "**Additional Staff Costs**"). Within thirty (30) days thereafter, the PLG, via the Trustee, shall notify the Town that:

(i) the PLG agrees to fund the Additional Staff Costs. In such case, the terms of this Agreement shall apply to such costs with necessary modifications; or

(ii) the PLG objects to the Additional Staff Costs. Following receipt of such notice from the Trustee, the Town shall, in its sole and absolute discretion, determine whether to assume responsibility for funding of such Additional Staff Costs. The terms of this Agreement shall not apply in any respect to such Additional Staff Costs undertaken or funded by the Town in accordance with this Subsection.

15. The Town shall provide to the Trustee in writing, at least quarter-yearly during the term of this Agreement, a statement showing the following:

a) the amount then incurred with respect to the actual Staff Costs;

b) the status of the Secondary Plan and estimated timing to complete same.

Focus Group

16. The Town shall establish a focus group (the "**Focus Group**") to guide and co-ordinate the preparation of the Secondary Plan.

17. The PLG shall be entitled to elect a representative to attend at regularly scheduled meetings of the Focus Group.

Non-Participating Owners within the Bridgeburg North Secondary Plan Area

18. The Town agrees to include policies in the Secondary Plan and as a condition of any planning and/or development approval for any lands therein, wherein the owners of lands within the Bridgeburg North Secondary Plan Area, specifically (but without limitation) including landowners who are not currently members of the PLG, shall be required, as a condition of any approval for the development of such lands, to provide written confirmation from the Trustee that they have joined the cost sharing group formed or to be formed by the PLG and is a member in good standing thereof.

Interpretation Not Affected by Headings, Etc.

19. Grammatical variations of any terms defined herein shall have similar meanings; words importing the singular number shall include the plural and vice versa; words importing the masculine gender shall include the feminine and neuter genders and vice versa. The division of this Agreement into separate Articles, Sections, Subsections, Paragraphs and Subparagraphs, the provision of a table of contents and index thereto, and the insertion of headings and marginal notes and references are for convenience of reference only and shall not affect the construction or interpretation of this Agreement.

Severability

20. If any covenant, obligation or provision of this Agreement or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this Agreement or the application of such covenant, obligation or provision to persons or circumstances other than those as to which it is held invalid or unenforceable shall not be affected thereby, and each covenant, obligation and agreement of this Agreement shall be separately valid and enforceable to the fullest extent permitted by law, unless such covenant, obligation or provision of this Agreement or application of the same which has been determined to be invalid or unenforceable is deemed by the Town, in its sole discretion to be fundamental to this Agreement, in which case this agreement shall be null and void.

Governing Law

21. This Agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein and shall be treated in all respects as an Ontario contract.

Disclaimer of Partnership

22. The parties disclaim any intention to create a partnership or joint venture or to constitute either of them the agent of the other. Nothing in this agreement shall constitute the parties as partners or agents of the other.

Notices

23. All notices under this agreement shall be given to the Parties at the following addresses:

To the Town:

Attention: Town Clerk
The Corporation of the Town of Fort Erie
1 Municipal Centre Drive
Fort Erie, Ontario
L2A 2S6
Fax No.: (905) 871-1600

To the PLG:

2627781 Ontario Inc.
PO Box 549
Fonthill ON L0S 1E0
Attn: Richard Dekorte
Email: Richard@hert.ca

BBFC Holdings Inc.
3976 Portage Road, Unit 2
Niagara Falls ON L2G 2C9
Attn: Mitch Williams
Email: info@tmmcap.com

2585908 Ontario Inc.
1755 Stevensville Road
Stevensville ON L0S 1E0
Attn: Vaughn Gibbons
Email: v.gibbons@vgibbonscontracting.com

To the Trustee:

Bridgeburg Landowners Group Inc.
c/o 7501 Keele Street, Suite 200
Vaughan, ON L4K 1Y2
Attention: Helen Mihailidi
hmihailidi@bratty.com
Fax No: 905 760 2900

With a copy to:

Upper Canada Planning & Engineering Ltd.
30 Hannover, Unit #3
St. Catharines, ON
L2W 1A3
Attention: William Heikoop, B.U.R.Pl., MCIP, RPP, Planning Manager
Email: wheikoop@ucc.com

or to such other address of a party as it shall specify to the other parties by written notice given in the manner aforesaid. Any such notice delivered or sent by facsimile as aforesaid shall be deemed to have been given and received on the date of actual delivery to the addressee.

Waiver

24. No consent or waiver, express or implied, by a party to or of any breach or default by another party in the performance by such other party of its obligations hereunder shall be deemed or construed to be a consent or waiver to or of any other breach or default in the performance by such other party hereunder. Failure on the part of a party to complain of any act or failure to act of another party or to declare another party in default, irrespective

of how long such failure continues, shall not constitute a waiver by such first-mentioned party of its rights hereunder.

Amendments

25. This Agreement may not be modified or amended except with the written consent of all parties hereto.

Further Assurances

26. The parties hereto agree that they will from time to time, at the reasonable request of any of them execute and deliver such assignments, instruments and conveyances, and take such further actions, as may be required to accomplish the purposes of this Agreement.

Successors and Assigns

27. This Agreement shall enure to the benefit of and be binding upon the respective successors and assigns of each of the parties hereto.

Effective Date

28. This agreement shall not be in force, or bind any of the parties, until executed by all of the parties named in it.

Entirety

29. It is agreed and understood that there is no representation or warranty, collateral term or condition affecting this agreement other than those set forth herein, and no other representation or warranty, collateral term or condition shall be binding upon the parties unless expressed in writing, signed by each party hereto and purporting to be expressed in modification of this agreement.

Counterparts and Electronic Execution

30. This Agreement may be executed in any number of counterparts and by facsimile or other electronic transmission, and each such facsimile or electronic copy shall constitute an original and all such counterparts shall for all purposes constitute one agreement, binding on all parties hereto notwithstanding that all parties are not signatories to the same counterpart.

IN WITNESS WHEREOF, the parties have executed this Agreement, attested by the hands of their respective officers duly authorized in that behalf.

THE CORPORATION OF THE TOWN OF FORT ERIE

Per:_____
Wayne H. Redekop
Mayor

Per:_____
Ashlea Carter
Clerk
We have authority to bind the Town.

2627781 ONTARIO INC.

Per:_____
Name: Richard Dekorte
Title:
I have the authority to bind the corporation.

BBFC HOLDINGS INC.

Per:_____
Name: Mitch Williams
Title:
I have the authority to bind the corporation.

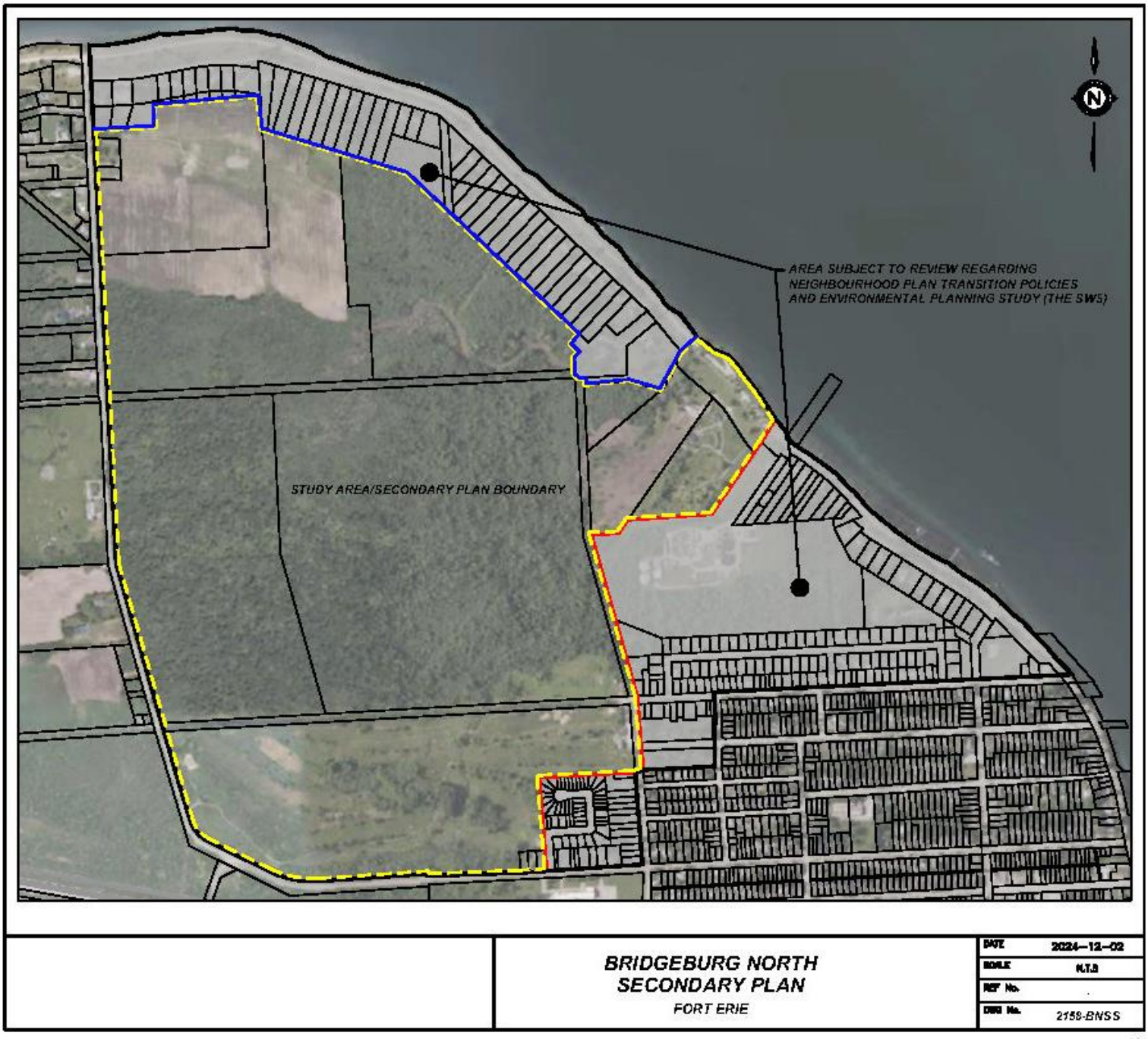
2585908 ONTARIO INC.

Per:_____
Name: Vaughn Gibbons
Title:
I have the authority to bind the corporation.

BRIDGEBURG LANDOWNERS GROUP INC.

Per:_____
Name: Helen Mihailidi
Title: A.S.O.
I have the authority to bind the corporation.

Schedule A – Bridgeburg North Secondary Plan Area



Schedule “B”

Terms of Reference

Terms of Reference

Bridgeburg North Subwatershed Study

February 2024

Contents

1.0 Introduction

The Growth Plan for the Greater Golden Horseshoe (2019), along with other guiding documents, promote integrated land use planning processes which consider multiple factors when planning for communities and neighbourhoods. These factors include the natural and physical environment, infrastructure needs, transportation, as well as socio-economic considerations. A cornerstone to contemporary planning, as recognized by the Growth Plan (2017), is the need for multi-disciplinary subwatershed studies which comprehensively establish a baseline characterization of the environmental conditions and natural systems and resources in a subject study area planned for growth developed on the basis of a subwatershed unit. This systems-based assessment involves an examination of the role of water (both surface and ground) in sustaining area resources, including creeks, wetlands, and other water-based features, including headwater drainage features. This baseline characterization, built on a period of field data collection and monitoring, then serves as the basis from which to examine and assess potential impacts due to planned urbanization. The impact assessment process includes a vetting of land use concept plans through an integrated and comprehensive planning exercise, that includes infrastructure studies such as Master Servicing (Water/wastewater) and Transportation Plans, which are advanced for consideration through a consultative process involving local and Regional municipalities, other provincial agencies, landowners, Indigenous groups, and the public. Once appropriately vetted, management and monitoring recommendations to implement the recommendations of the Subwatershed Study and related municipal Master Plans are translated into policy and strategies for community development.

The new Niagara Region Official Plan requires subwatershed studies to be completed for new Greenfield areas as Niagara Region Official Plan policy 6.1.4.9. As part of Niagara Region's Official Plan, a Watershed (equivalency) Plan was prepared to inform and support the Region's New Official Plan. The Region's Watershed Plan may provide foundational information and guidance when undertaking the subwatershed study work for each Secondary Plan Areas identified in this RFP. Other documented guidance, such as the draft Ministry of Environment, Conservation and Parks (MECP) Subwatershed Planning Guide (January 2022) and the Niagara Peninsula Conservation Authority Interim Environmental Impact Study Guideline (in relation to the Natural Features Impact component of the Subwatershed Study ("SWS")) and draft Niagara Region EIS Guidelines, 2023.

1.1 Study Area

The North Bridgeburg area is approximate 285 hectares in size and is bounded to the north and east by the Niagara River, to the south by the existing community of Bridgeburg which is predominately low density residential, and neigbourhood commercial, with opportunities for intensification, and to the west by Thompson Road, the current urban boundary line. A large segment of the study area is impacted by the Frenchman's Creek and its associated floodplain and wetlands represent the major environmental features associated with the subject lands.

The Subwatershed study will be scoped to the limits of the surrounding subwatershed, including but not limited to the Frenchman's Creek Subwatershed and be consistent with the requirements of Regional Policy 3.2.3.2.

The following features are present within the Study Area:

- Provincially Significant Wetland, Frenchman's Creek Wetland Complex;
- NPCA Regulated Watercourses;
- Frenchmen's Creek (MNRF Type I Critical Fish Habitat) and its associated tributaries, flood plain and erosion hazard;
- MNRF Type II Important Fish Habitat;
- Unevaluated Wetlands.

The following Table depicts the Species at Risk (SAR) documented within approximately 1 km of the Study Area. SAR data is disseminated by the MECP and UTM coordinates for the occurrences of the species identified below are not able to be provided. Please note that this list may not be inclusive:

Table 1: SAR Records within 1km of the Stuy Area

Scientific Name	**Common Name**
Haliaeetus leucocephalus	Bald Eagle
Riparia riparia	Bank Swallow
Oenothera gaura	Biennial Gaura
Nyssa sylvatica	Black Gum
Dolichonyx oryzivorus	Bobolink
Aythya valisineria	Canvasback
Chaetura pelagica	Chimney Swift
Silphium laciniatum	Compass Plant
Cornus florida	Eastern Flowering Dogwood
Sturnella magna	Eastern Meadowlark
Ligumia nasuta	Eastern Pondmussel
Opuntia cespitosa	Eastern Prickly-pear Cactus
Digitaria cognata	Fall Crabgrass
Corvus ossifragus	Fish Crow
Anaxyrus fowleri	Fowler's Toad
Esox americanus	Grass Pickerel
Moxostoma valenciennesi	Greater Redhorse
Arisaema dracontium	Green Dragon
Carex hirsutella	Hairy Green Sedge
Podiceps auritus	Horned Grebe
Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)
Lanius ludovicianus	Loggerhead Shrike
Chrysemys picta marginata	Midland Painted Turtle
Falco peregrinus	Peregrine Falcon
Aythya americana	Redhead
Mimulus alatus	Sharp-winged Monkeyflower
Asio flammeus	Short-eared Owl
Chimaphila maculata	Spotted Wintergreen
Hylocichla mustelina	Wood Thrush

1.2The Objectives of the Subwatershed Study

The purpose of the Local Subwatershed Studies is to assist in developing a sustainable development plan for the Bridgeburg North Secondary Plan Area in Fort Erie by ensuring protection and benefits to the natural and human environments. Subwatershed Studies are intended to incorporate a natural heritage systems management approach that will protect, rehabilitate, and enhance the environment within the Secondary Plan Area, and the surrounding lands in the subwatershed. The broader watershed/subwatersheds may have existing downstream constraints beyond the identified Secondary Plan study area and, to the appropriate extent, these will have to be considered in establishing the management strategies based on the overall study objectives and ultimate targets. Where there is an established watershed wide quantity strategy, the established strategy is to be considered a minimum requirement. The Subwatershed Studies will need to provide the following:

- Identify the location, extent, present status, significance, and sensitivity of the existing natural environment;
- Identify environmentally sensitive areas and natural hazards, including constraints and opportunities;
- Identify an environmental resource system(s) to protect, rehabilitate, and enhance the ecological function of the system within the Secondary Plan Area;
- Identify lands where development may be considered, and determine how existing and future land uses can be developed compatibly with natural features;
- Undertake a two-stage, iterative Impact Assessment based on an initial Preliminary Preferred Land Use Plan (This inherently will require establishing an initial land use concept which will need to be tested and assessed, followed by a second refined land use concept developed through the feedback from the initial testing, including input from other technical studies and feedback from stakeholders);
- Provide direction on best management practices (BMPs) to manage impacts from the Secondary Plan (from an environmental and water management perspective), and, where there are established BMPs for infrastructure, these established BMPs are considered a minimum requirement;
- Provide direction on future infrastructure needs (i.e. planning and implementing servicing and transportation infrastructure from an environmental and water management perspective);
- Establish an implementation and management strategy and requirements for environmental systems monitoring;
- Support the Class Environmental Assessment process undertaken as part of the infrastructure planning for the Secondary Plan, specific to natural and water-based systems.

2.0 General Summary of the Subwatershed Process

2.1 Scope and Approach

The Secondary Plan Work Program and related Studies will guide the development of the Secondary Plan area through a consultative, collaborative, and coordinated process to establish a compact, complete, healthy, and resilient community.

The Subwatershed Study will describe the location, extent, sensitivity and significance of natural features and functions within the identified study area and evaluate the factors and influences that are important to their sustainability. The respective studies will establish goals and objectives for terrestrial and aquatic systems (i.e. natural heritage) and water resource systems in accordance

with the Provincial Policy Statement, the Region's Official Plan, Municipal Official Plan, and the applicable Watershed Plans. Using existing desktop information and studies and reconnaissance-level and detailed fieldwork, the respective studies will document existing conditions, assess potential impacts of existing and future development and recommend management strategies to manage and mitigate the predicted impacts, including comprehensive stormwater management strategies to protect, enhance and restore hydrologic functions. In conjunction with the concurrent development of the Secondary Plan, including Transportation and Servicing Master Plans (water, wastewater, and stormwater), the Local Subwatershed Studies will reflect and refine the Natural Heritage System and Water Resource System in the Secondary Plan area and identify strategies to protect, enhance and restore ecological functions and promote compatible activities.

In addition, the Subwatershed Studies include monitoring pre-development to characterize existing features and systems and baseline conditions. The initiation of monitoring is necessary to properly characterize the study area and further to conduct a thorough impact assessment at a detailed level for the local SWS and Secondary Planning Stage. The post-development monitoring program, implemented following completion of the Subwatershed Study, is also required to provide appropriate recommendations to apply adaptive environmental management incorporating the environmental monitoring program in Town-led initiatives, such as broader scale planning strategies and secondary planning recognizing that development and secondary planning will be staged and phased with opportunities to adjust requirements in subsequent planning stages. In this regard, the Subwatershed Study is required to provide guidance for developing and implementing a monitoring program post development, as well as to provide direction regarding the timing and duration associated with each monitoring component, the party responsible for the various monitoring components, and funding timing and strategy.

Fundamentally, the Consultant will ensure the study work is consistent with, and effectively addresses, components identified in Niagara Region Official Plan Section 3.2.3.2. The subwatershed studies (or equivalent) would be expected to follow best practice and be structured in three phases of deliverable. The following sections provides an outline of the stages of the study expected to meet approval of the responsible approval authorities and the Town.

A Technical Work Plan is required prior to the initiation of Phase 1. The plan would include a detailed list of field work and monitoring to be completed along with mapping to properly characterize and undertake required modelling for the study area. The technical work plan will be finalized and approved by the municipality, relevant Conservation Authority, and Region prior to initiating field surveys, etc. in the characterization phase (Phase 1) and prior to proceeding into the Impact Assessments (Phase 2).

Phase 1: Characterization and Integration

Phase 1 characterizes the resources associated with each subwatershed (and outlet) by study discipline (i.e., hydrology/hydraulics, groundwater, water quality, stream morphology, aquatic, and terrestrial ecology). Background and supplemental field data are to be assessed by each discipline, and then across disciplines, to:

a) establish the form, function and linkages of the environmental resources,
b) identify environmental constraints and opportunities related to terrestrial and aquatic habitat, features, and systems,
c) establish surface water and groundwater constraints and opportunities associated with flooding, erosion, water quality, water budgets, including recharge and discharge areas through new numerical tools (models) suitably calibrated to local conditions

d) establish criteria and constraints for management opportunities associated with the environmental features and systems.

From this work, preliminary “working” goals, objectives, and targets will be developed and refined over the study period for the respective subwatershed(s) in consultation with a Technical Advisory Committee (TAC), comprised of representatives from Town of Fort Erie, Niagara Region, CAs, and local agencies. The Phase 1 characterization includes pre-development monitoring to characterize existing systems and features as well as to inform establishing baseline conditions for comparison with post-development conditions.

Secondary Plan land use concepts will be generated and refined over the course of the subwatershed Phase 1, due to the time involved in completing the Phase 1 subwatershed study work. The Proponent will, in consultation with the Town and Technical Advisory Committee, will prepare up to three (3) land use concepts for each of the Plan Areas that can be assessed at a higher level, and used to engage the public for additional commenting and opinion. Following the engagements, a preferred land use concept with be prepared for detailed assessment.

Phase 2: Subwatershed Impact Assessment

Phase 2 identifies future stressors, describes (past, present) and predicts (future) impacts, and assesses these impacts against the preliminary goals, objectives, and targets developed as part of Phase 1. Future land use scenario(s) are evaluated based on input from the TAC. For various disciplines (i.e. groundwater, hydrology, hydraulics and water quality) analytical tools are used to predict changes to existing conditions in relation to subwatershed-based targets. Information and analyses from previous background studies will be used to assist modelling future land use scenarios. For others (i.e., terrestrial and aquatic ecology) predictions will inherently be semi-quantitative, qualitative or conceptual, integrated with predictions from other subwatershed disciplines (i.e., hydrogeology, hydrology, hydraulics and water quality) and experience elsewhere including knowledge of habitat/biota interactions.

As noted earlier, the Subwatershed Impact Assessment process is expected to be a two-stage iterative process whereby an initial land use concept will be evaluated/tested against the preliminary targets, and the feedback from this initial test will then inform the establishment of a refined land use concept.

Phase 3: Management Strategies, Implementation, and Monitoring Plan

Phase 3 will use the findings of Phase 2: Impact Assessment (first and second iteration) to refine and finalize the evaluation of various land use scenarios and recommend a set of preferred management strategies, addressing the preferred land use designations and form, established through broader planning input to achieve the identified goals and objectives, and to establish the recommended strategies. An Implementation Plan will be prepared to offer guidance on: locations and types of SWM facilities, staging/phasing, future study requirements, monitoring, Environmental Assessment requirements, and general economics.

Phase 3 also involves the development of a long-term monitoring initiative that is to evaluate the effectiveness of the proposed management strategies post-development by assessing whether the assumptions made at the Subwatershed Study scale are appropriate and predictions made are sufficiently accurate. The feedback from monitoring will then be used through a process of adaptive management to determine if parts of the Subwatershed Study strategies and/or

recommendations should be modified. While the execution of the monitoring plan is not included within the scope of work for the Subwatershed Study, the Local Subwatershed Studies are nevertheless to provide framework-level direction regarding the components, methods, duration, and key locations for the execution of the monitoring program, as part of future work. Further details on area specifics would need to be considered as part of future neighborhood scale studies.

2.2 Phase 1 – Subwatershed Characterization and Integration

2.2.1 Background Information Review/Gap Analysis/Work Plan Confirmation

Background Information Review:

During Phase 1, the Study Area will need to be characterized and preliminary mapping of constraints and opportunities will need to be developed. Information shall be obtained through three levels of investigation, including (i) review of desk-top secondary sources (compiling information from existing documents); (ii) reconnaissance-level fieldwork; and (iii) detailed fieldwork.

The following existing desk-top information relevant to the Subwatershed Study Area will need to be reviewed:

- Niagara Official Plan schedules and associated online mapping
- Town of Fort Erie Official Plan schedules and online mapping
- Town of Fort Erie Natural Areas Inventory
- Watershed Plan(s) and/or Subwatershed Plan(s)
- Aerial / satellite imagery of the project area (to screen for unmapped features / potential features)
- Conservation Authority mapping (e.g., regulated areas, wetlands, etc.)
- Land Information Ontario (L.I.O.)
- Natural Heritage Information Centre (N.H.I.C.)
- Department of Fisheries and Oceans (D.F.O.) Species at Risk mapping
- eBird
- iNaturalist
- Ontario Geological Survey (OGS (Chapman and Putnam)
- Source Water Protection Atlas
- Ontario Reptile and Amphibian Atlas (Ontario Nature)
  Ontario Butterfly Atlas (Toronto Entomologists' Association)
  Atlas of the Breeding Birds of Ontario (Birds Canada)
- NPCA records indicate MNRF fisheries data for Frenchman's Creek and at the mouth of Frenchman's Creek where it outlets to the Niagara River. Information on Fisheries Database Sites can be requested from the MNRF office in Vineland (David Denyes Tel: (289) 241-6872 or david.denyes@ontario.ca).
- NPCA Natural Areas Inventory 2006-2009 Volume 1:
  (https://npca.ca/images/uploads/board_files/NAI-Vol-1.pdf)
- NPCA Natural Areas Inventory 2006-2009 Volume 2:

(https://npca.ca/images/uploads/common/NAI-Vol-2.pdf)

- 2022 Water Quality Report: (https://npca.ca/images/uploads/common/NPCA_Water_Quality_Monitoring_Program_Summary_Report_of_the_Year_2022.pdf)
- 2023 Watershed Report Card: https://npca.ca/images/uploads/common/WRC_NPCA_2023_-_CO.pdf
- NPCA Authority Open Data (arcgis.com).
- NPCA Regulatory Mapping
- 2008 Fort Erie's Creek Watershed Plan, all associated mapping and technical figures done by Phillips: found on NPCA website under the Watershed Health tab
- NPCA Natural Areas Inventory: found on NPCA website under the Watershed Health tab
- Provincial Groundwater Monitoring Network data,
- NPCA groundwater monitoring well data from a well northwest of the study area, located adjacent to the Niagara Christian Collegiate. Groundwater level and chemistry data is available upon request.
- Environmental Impact Study: Proposed Official Plan Amendment Bridgeburg Development Inc (Beacon, 2020a)
- Environmental Impact Study: Miller Property Thompson Road Fort Erie (Beacon, 2015)
- 1075 Niagara Parkway Natural heritage Assessment: Existing Conditions and Development Constraints (Beacon 202b)
- Wetland Water Balance Risk Evaluation https://trca.ca/app/uploads/2017/12/WetlandWaterBalanceRiskEvaluation_Nov2017.pdf
- Wetland Water Balance Monitoring Protocol https://trcaca.s3.ca-central-1.amazonaws.com/app/uploads/2016/08/17180016/TRCAWetland-Water-Balance-Monitoring-Protocol-1.pdf
- Water Balance Guidelines for the Protection of Natural Features https://sustainabletechnologies.ca/app/uploads/2013/04/SWM-Criteria-2012_AppendixD.pdf

Gap Analysis:

Background data used to prepare the Subwatershed Study, will need to be documented listing its source and format (e.g. municipal report/agency website/personal communication). For map data, the map scale shall be specified. The list of source materials shall follow a generally accepted bibliographic format. The purpose of documenting the background data is to facilitate a "gap analysis" and identify methods preferred by which to appropriately address the information gaps in Phase 1.

A summary of each document from which information was used to prepare the Subwatershed Study will need to be prepared. For each source, a brief (single paragraph) review shall be produced, summarizing the source's content, and describing its relevance to the Subwatershed Study.

Work Plan Confirmation:

Once all of the background data have been collected, the need and requirements for obtaining additional information beyond that outlined in the core scope shall be determined, and a proposed program for collecting additional data shall be outlined to the TAC. This process allows for collaborative consultation on the Work Plan. It will be important to receive final sign-off from the TAC prior to advancing the updated/refined work plan. Site visit(s) with agency staff (Town of Fort Erie, Niagara Region and NPCA) will need to be completed prior to the finalization of the Work Plan.

2.2.2 Hydrology and Hydraulics

Background information on the study area is to be collected from all available sources. For each subwatershed and associated outlet the physical features (e.g. subwatershed boundary, physiography, topography, soils, major watercourses, drainage swales, and wetland features) within the Secondary Plan Area shall be established. Any specific areas of interest shall be defined, identifying important implications on development potential, environmental features, and / or watercourse system function.

Hydrology

A detailed hydrologic model (continuous) shall be selected for use in the Local SWS. The NPCA has hydraulic and hydrologic models for Frenchmans Creek that was undertaken in 2004 and will need to be updated with current metrics. It is recommended that as part of the review of background data, that the locations for streamflow gauges and rain gauges be identified. Field data for model calibration/validation should be collected between April and November inclusive. Once calibrated/validated the model is to be executed in both event and continuous mode to generate peak flows for a range of storms including 2, 5, 10, 25, 50, 100, 350 year and Regional Storm.

The results from the surface water model should be used to corroborate the water budget developed as part of the Hydrogeologic assessment.

The hydrologic modelling is to establish the baseline hydrology for the subwatershed systems. As noted, it is expected that the model(s) will be calibrated/validated based upon both historical rainfall and flow monitoring data, as well as new study data collected as part of this study. The exercise should meet the standards to provide a comprehensive understanding of the existing hydrologic conditions of the study area. The model shall be calibrated/validated to provide comparable flows at the subwatershed outlets to those determined in any previous watershed or drainage studies for the given watercourses. The extent of area modelled should be sufficient to generate results at downstream locations/confluence points and locations of interest (i.e. Special Policy Areas, Flood Vulnerable Areas, Flood Vulnerable Roads) to confirm development will not have adverse impacts on the peak flow rates.

The Erosion potential assessment of receiving and downstream watercourse shall be carried out using continuous simulation of watercourse flows over a suitable period time, to evaluate the duration of critical flow exceedance, cumulative shear stress exceedance, or stream power based on the erosion thresholds established by the study stream morphologist and the associated guidance on the appropriate methodology.

Hydraulics

The Study will involve preparation of a field inventory of creeks, road crossings (culverts and bridges), stormwater facilities, etc. The current drainage systems and outlets shall be identified

with drainage constraints and opportunities. The intent of hydraulic modelling is to define area hazards and system constraints.

For established and regulated watercourses located in the study area, hydraulic analyses shall be conducted. Flood lines shall be established for the Regulatory Event (100 Year Storm) for existing conditions. For the creeks that have flood plain delineation, as identified in previous studies, the flood lines shall be updated to reflect the current limits of the flood hazard. The flood plain delineation should be based on hydraulic modelling, using the 2004 NPCA hydraulic model to generate the associated flood lines based on the peak flows established through the hydrologic analysis conducted for the subwatershed study. It is noteworthy that this study, while preparing preliminary floodlines for land use planning purposes, is not intended to be a formal floodline mapping study.

Hydrogeology

The goal of this Subwatershed Study with respect to hydrogeology is to establish a geological conceptual model for the study area, determining the key characteristics of the bedrock and overburden systems, in addition to their functions in terms of controlling groundwater movement, availability, and quality in the subwatershed study area; This model will need to be developed as part of this Subwatershed Study. An integral component is to assess the interactions between the groundwater system and the surface water system, and to determine the overall role or function of these interactions in an ecosystem context. It is also important to have an understanding of the effects of future development on the local groundwater resource to assist in the need and implementation of techniques to address overall water balance. The incorporation of field monitoring using new data and modelling tools will achieve the primary objectives and extend the understanding of the following key issues:

- Presence of potentially significant local recharge areas, linked with local discharge,
- Shallow depth to groundwater: strong upward gradient,
- Groundwater/surface water interaction,
- Dewatering issues,
- Seepage areas and
- Existing tile drainage.

The groundwater field program is expected to include but not be limited to the following:

- Monitoring well installations with borehole logs,
- Drivepoint piezometers,
- Manual and continuous water level measurements,
- Groundwater and surface water chemistry,
- Hydraulic conductivity measurements and
- Spot baseflow measurements.

A conceptual groundwater model will aim to:

- Refine geologic interpretation and hydrostratigraphy including surficial geology and
- hydrogeologic parameters.
- Refined understanding of observed shallow groundwater conditions as they relate to response to storm events, upward gradient and potential impacts on infrastructure.

- Refine mapping and interpretations groundwater discharge areas (subwatershed scale and reach
- scale).
- Refinements to understanding of groundwater flow include contributions to and from areas
- outside the subwatersheds.

The baseline groundwater conceptual model and groundwater model analysis should incorporate observations and technical assessment from the hydrologic, terrestrial, aquatic and fluvial geomorphologic characterizations. These would include for example:

- Observations of seepage and discharge,
- Fish habitat,
- Phreatophytic observations,
- Streambed composition, and
- Low flow analysis and water quality.
- In turn the groundwater characterization should provide technical input to aid in confirming or guiding the characterization of the component subwatershed studies.
- Field observations for groundwater discharge will be coordinated at the outset of the field program. In order to efficiently use the field resources, observations from all disciplines should be utilized, as it is expected that more field reconnaissance is carried out by terrestrial, aquatic and fluvial geomorphology in the course of their work.

2.2.4 Stream Morphology

Several objectives concerning aquatic habitat are intended to protect the morphological and fluvial character of the study area streams, with the intent (where feasible) to restore sinuosity, maintain physical habitat attributes (e.g. pools, riffles etc.), diversity and fluvial processes (e.g. bed load transport, energy reduction through sinuosity, etc.), and to prevent increases in erosion and deposition through the maintenance of the hydrological regime.

Available data for the subwatershed and other existing sources, is to be reviewed and confirm the need for updating the existing information. Reach delineations are to be confirmed and/or updated based on refined mapping and field investigations. Each reach is to be characterized using industry standards including the application methodology presented in *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (CVC and TRCA, 2014). A baseline morphologic assessment, according to stream characterization and flood /erosion considerations, is required including a detailed inventory of stream morphology observations. Through field-based observations of channel process and stability, sensitive and/or representative sites are to be selected to complete detailed field surveys for an erosion threshold analysis at the systems scale.

There are valley slopes associated with Frenchmans Creek, in general these slopes are flatter than 3:1, meaning they are stable. Stable top of slope may be landward of physical top of slope depending upon the toe erosion allowance. NPCA previously conducted a site visit on January 12, 2019 to identify the physical top of slope along the east side of Frenchmans Creek for the property with tax roll number: 270302002613000. It is unknown if the current property is in the same ownership as in 2019. The physical top of slope for the remaining sections Frenchmans Creek will need to be completed.

An erosion potential analysis is to be conducted, based on the erosion data collected to understand the erosion processes and to identify areas which are prone to erosion, or where

existing structures may be at risk. This will be completed though desktop and field analyses. The erosion potential analysis is also to determine the threshold flows for erosion at strategic points in the subwatershed for input to the hydrologic assessment. Assessments will identify sites most sensitive to erosion, with reasonable details covering the entire study area.

An erosion hazard delineation will be completed for each watercourse reach. The valley setting will determine whether a meander belt (unconfined systems), or a long-term stable top of slope (confined systems) is delineated. These assessments and application of setbacks will conform to Provincial Policy and applicable Conservation Authority Regulations.

In addition, the Study Team's Stream Morphologist, along with others on the Study Team including aquatic and terrestrial ecologists and surface and groundwater specialists, are to conduct an assessment of the headwater drainage features (HWDF) in accordance with the TRCA/CVC 2014 protocol as referenced above. The assessment will need to involve multi-seasonal fieldwork and an integrated interpretation of the data to establish current classification and future management (Phase 3). Any site specific modifiers to the protocol will need to be vetted through the study's Technical Advisory Committee prior to finalizing and proposing management recommendations.

2.2.5 Aquatic Environment

Conduct an assessment of fisheries in the subwatershed study area. Detailed field assessments of the aquatic environments shall generally be undertaken in the areas of fish and riparian habitat, including areas immediately upstream and downstream of these habitat areas. Comprehensive headwater drainage feature (HDF) assessments throughout the study area are required as part of the Subwatershed Study process. Guidance on HDF evaluation is available in Appendix "P" of the NCPA's Planning and Procedural Manual. A photolog of all HDFs and watercourses within the study area shall be included/appended in the Subwatershed Study. Stream classifications based on the priority of the habitat type as well as cold, cool, and warm water designations shall be identified. An assessment of stream barriers and on-line ponds will need to be undertaken to determine potential impacts of development on aquatic resources. Where applicable, the criteria and considerations contained in Table 1 will form the basis for evaluating watercourses. The data collected will be used to ensure that future development will have no negative impacts on fish habitat or the ecological functions for which the area has been identified. Opportunities for enhancement of the aquatic environment shall also be identified.

When assessing species, status should include federal, provincial and local rankings. In addition, maps that identify the results of the aquatic investigations shall be provided. Areas of interest should be identified by comparing existing land uses to sensitive aquatic habitats.
Further, as noted above, the Study Team Aquatic Ecologist will need to support the HWDF assessment based on the "Evaluation, Classification and Management of Headwater Drainage Features Guidelines" (CVC & TRCA, January 2014).

Table 1. Aquatic Environment Inventory Requirements

Biophysical Inventory	Inventory Requirements
Fisheries Assessment	Electrofishing may be required. If required, MNRF Permits would need to be obtained. Acceptable protocols, i.e. Ontario Stream Assessment Protocol (OSAP), should be followed.

Habitat Assessment	Assess watercourse habitat using acceptable protocols, i.e. the OSAP module
Species at Risk Screening	Screening should include results from all available sources, i.e. Natural Heritage Information Centre, Ministry of Natural Resources and Forestry (MNRF), Municipal List and Conservation Authority database, and Fisheries and Oceans Canada (DFO) screening map.

The MNRF has identified in-water restricted timing windows for the Upper Niagara River and Tributaries (no in-water works to occur between these dates):

- Near and Offshore Spring Season: March 1st to July 15th (Primary sensitive species: Large and Smallmouth Bass, Northern Pike, Muskelluge, Grass Pickerel, Lake Sturgeon, Yellow Perch, Rainbow and Brown Trout, Walleye, Emerald Shiner, Rare Minnow Species (i.e. Central Stoneroller), River and Greater Redhorse)

The above timing windows are derived from *MNR (2016) Niagara Regional Municipality Fish Habitat types with Management Rationale* document. For more information regarding fisheries timing windows, it is advised to contact the MNRF Office in Vineland (David Denyes: David.denyes@ontario.ca)

2.2.6 Terrestrial Environment

Landscape Scale Screening

In order to better understand the ecological context of the proposed development area as part of the overall subwatershed, a review of the provincial, regional, and conservation authority Natural Heritage Systems will be required, building upon the Regional Scoped SWS. The purpose of this review will be to generate information on the ecological context of the Study Area and its potential connectivity within the broader landscape. This Landscape Scale Screening will be helpful to identify terrestrial and wetland habitat connectivity, potential wildlife movements, and the ecological context of the Secondary Plan Area, in relation to the surrounding environs to help understand and to develop linkages between the ecological systems. This screening will rely on existing information sources.

Building on the approaches used in the scoped SWS, a variety of metrics should be used to quantify existing landscape-scale conditions and functions. Given the broader scale of interest, the objective should be to characterize patches of natural cover that occur within the subwatersheds being studied. Metrics should include, but are not limited to, those that quantify:

- The occurrence and diversity of vegetation community types within and across patches
- The size and shape characteristics of vegetation and habitat patches
- Matrix influence on features and/or natural area patches
- Connectivity of patches

- The occurrence and coverage of features and/or habitats that have policy implications (e.g.
- habitat for Species at Risk, species that are provincially rare, Significant Wildlife Habitat, etc.)

Assessment of Terrestrial Resources

An assessment of terrestrial resources in the subwatershed shall be undertaken. The Natural Area Inventory information from the Conservation Authority and the Town of Fort Erie should be consulted prior to the initiation of field work. The data collected shall be used to ensure that future land-use planning and development is consistent with Section 2.1 of the Provincial Policy Statement and the Niagara Region Official Plan.

Depending on the vegetation community, Ecological Land Classification (ELC) results and habitats determined to be present in the study area, it may be appropriate to undertake targeted surveys for certain taxa or species, rather than rely solely on incidental observation. The Significant Wildlife Habitat Eco-Region 6E Criteria Schedules (MNR, 2015) should be used in conjunction with the Significant Wildlife Habitat Technical Guide when assessing Significant Wildlife Habitat; this analysis should incorporate advancements in SWH analysis that are provided by stakeholders and agencies (e.g. watershed-scale SWH mapping).

Detailed field assessment of the terrestrial resources shall be provided to characterize the terrestrial environment and establish a baseline terrestrial environment for the Secondary Plan Area, including the proximity to, and the degree of linkage with other habitats. When assessing species, status should include federal, provincial and local rankings. In addition, maps that identify natural heritage features and the results of the terrestrial investigations shall be provided. Features are to be assessed against criteria and direction outlined in the scoped Subwatershed Study (Phase 1) to inform implementation of management guidelines for features and other components of the NHS (Phase 2 and 3 of the scoped Subwatershed Study). Specific consideration shall be given to the location and relationship of features and areas within the NHS (e.g., occurring within the Province's NHS, linkage, proximity to Key Features, etc.). Opportunities for enhancement of the terrestrial environment shall be explored.

Table 2. Terrestrial Environment Inventory Requirements

Biophysical Inventory	Inventory Requirements
Vegetation Community Identification	Use Ecological Land Classification to classify vegetation communities according to Lee et al. (1998). Three plots should be evaluated per ELC polygon with raw field sheets appended to the report.
Botanical Inventory	3 season survey (spring, summer and fall) to identify species
Native / Invasive Flora Survey	Determine the percentage of Native and Invasive Species in surveyed vegetation communities.
Woodland Evaluations	Inventory within woodland areas should be sufficient to evaluate the significance of woodland features based on relevant criteria and policy definitions. Woodland boundaries should be field verified with responsible authorities where feasible

Evaluation of Unclassified Wetlands	Document species records and wetland community types consistent with methods used in the Ontario Wetland Evaluation System (OWES)
Breeding Bird Surveys	Ontario Breeding Bird Atlas protocol or Forest Bird Monitoring Protocol / Marsh Monitoring Protocol where appropriate. Technical Work Plan to identify point count locations and appropriate methodology.
Reptile Surveys (Turtle, Snakes)	Use active searching or other commonly accepted MNRF protocols/methods (April- July and Sept.-Oct.)
Amphibian Breeding Surveys	3 surveys between April and June corresponding to specific nighttime temperatures of >5°C, >10°C and >17°C, according to the Marsh Monitoring Protocol. Salamander surveys are required using active searching and should be completed in spring in appropriate ponds to determine the presence of salamander breeding areas
Bat Surveys	Leaf on and leaf-off bat roost surveys and acoustic monitoring according to the 2017 Guelph District MNRF Protocol for Little Brown Myotis, Northern Myotis and Tri-coloured Bat
Incidental Wildlife Observations	Incidental sightings of all wildlife (mammals, birds, butterflies, dragonflies, damselflies, amphibians, and reptiles) should be recorded during site investigation
Species at Risk Screening	Screening should include results from all available sources, i.e. Natural Heritage Information Centre, wildlife atlases, MNRF Municipal List and Conservation Authority database
Significant Wildlife Habitat Screening and Assessment	This assessment will include identifying candidate and confirmed Significant Wildlife Habitat and will utilize the MNR's **Significant Wildlife Habitat Technical Guide 2000)** and associated Criteria Schedules (MNRF 2015).

2.2.7 Surface Water Quality

Currently available background information shall be used to provide a preliminary understanding of the baseline water quality in the Secondary Plan Area and subwatershed. The existing datasets (water quality surface water chemistry and benthic macroinvertebrate data) from NPCA will be provided and shall be reviewed to understand the existing water quality status proximate to the study area. The NPCA summarizes its water quality data using the Canadian Water Quality Index (Canadian Council of Ministers of the Environment. 2001. Canadian Water Quality Index). The NPCA has determined the Water Quality rating for Frenchman's Creek at station FR003 as poor based on the concentrations of chloride, Copper, E.Coli, Lead, Nitrate, Total Phosphorus, and Total Suspended Solids and Zinc; This poor rating has been in place since 2020. The NPCA observed exceedances of Provincial Water Quality Objectives and Canadian Water Quality Guidelines of chloride, copper, E.coli, Total Phosphorus, and Total Suspended Solids and Zinc in the last 5 years. For stream benthic macroinvertebrates, the NPCA calculated a Hilsenhoff Biotic Index rating ranging from fairly poor to very poor suggesting substantial to severe organic

pollution. Calculation is based on: Hilsenhoff, William L. 1987, An Improved Biotic Index of Organic Stream Pollution. The Great Lakes Entomologist. 20: 31-36.

The existing water quality status shall be assessed to provide the baseline reference, and identify any water quality concerns and constraints in the study area. Other studies such as the Conservation Authority's Source Water Protection work will have some relevant data to contribute to this understanding. The study will also locate existing SWM facilities and the respective catchment areas, as the baseline reference for stormwater management in terms of water quantity/ quality control.

NPCA should be contacted to determine the need for additional grab samples during the Subwatershed Study. If required, the following information has been provided to guide the collection of samples:

Local water quality monitoring data are collected in order to characterize the surface water quality based upon the contributing land use, soils, and stormwater quality management practices during both wet (storm) and dry (baseflow) periods. Surface water quality monitoring at the same locations as the streamflow gauging in order to correlate the surface water quality with the study area hydrology. Surface water quality monitoring would need to be conducted between the months of April and December. Water quality grab sampling would be completed at each station for three (3) dry weather events and capturing at least one (1) wet and one (1) dry event for each season. Two (2) grab samples would be obtained for each wet weather event, with the objective of characterizing the surface water chemistry during the onset of the storm with the first sample, and characterizing the surface water chemistry during the recession of the storm with the second sample. Grab sampling has been recommended over the use of automated samplers as prior experience with the use of automated samplers has demonstrated logistical issues related to the pre-determination of the sampling duration and interval, functional issues related to the "triggering" of the sampler and siting on a flat surface, as well as other issues related to protection against vandalism.

The grab samples for each wet weather and dry weather event will need to be analyzed for the following contaminants:

- Oil and Grease
- Total Phosphorus
- Anions (Nitrate, Nitrite, Phosphate, Chloride)
- Ammonia
- Total Kjeldahl Nitrogen (TKN)
- Conductivity
- Total Solids (TS)
- Total Suspended Solids (TSS)
- BOD5
- Dissolved Oxygen
- pH/alkalinity
- Salinity
- Total Coliforms/Fecal Coliforms/E. Coli
- PAH
- Metals (Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, P, K, Se, Si, Ag, Na, Sr, Tl,
- Sn, Ti, W, U, V, Zn, Zr)

- Hardness as CaCO3
- Turbidity

2.2.7 Phase 1 Report – Subwatershed Characterization and Integration

At the completion of Phase 1, the general characteristics of the subwatershed study area will have been identified and a clear understanding of the constraints and opportunities will have been developed. Constraints and opportunities mapping shall be developed, and a preliminary Natural Heritage System should be identified. The Phase 1 Report will establish the general characteristics of the subwatersheds and the Secondary Plan Area, which will be the starting point from which the proposed land uses are to be developed. Of importance, the Phase 1 Characterization report should identify/delineate all key natural heritage and key hydrologic features and assess their status and significance tied to policy requirements, as a key deliverable and component of the constraint mapping.

The Phase 1 Report shall include:

- Summary of background literature and data reviewed;
- Subwatershed study area characterization including:
    a) Climate, landform, geology, and soils
    b) Hydrogeology/groundwater quantity and quality
    c) Surface water quantity and quality
    d) Stream geomorphology
    e) Aquatic and Terrestrial ecosystems

  based on the findings of the:
    i) Review of secondary sources (compiling information from existing documents);
    ii) reconnaissance-level fieldwork; and/or
    iii) detailed fieldwork.

- Assessment of above identified features and functions to evaluate their significance
- Summary of the subwatershed study area major issues, concerns and constraints; and,
- Raw data sheets and field survey location maps for all field studies included within appendices

The constraint-based framework that is developed should be consistent and inclusive of all relevant federal, provincial, municipal, and CA policies and clearly identify areas that are protected from development and those that provide opportunities for development.

Note: It is expected that a Draft Table of Contents will be submitted for review and comment well in advance of the Draft Report submission. A minimum of three weeks should be allowed for submission of comments on all submitted deliverables, including Draft and Final Reports.

2.3 Phase 2 – Impact Assessment

Based on the outcomes of Phase 1, including the review of background information sources and supplementary fieldwork, Phase 2 will require an iterative assessment of the potential impacts of future land use changes on the natural environment and water system within the study area. The findings from the Phase 1 Characterization and Integration work, completed by the various disciplines, along with the outcomes of the initial servicing and transportation needs, will be considered in an integrated manner in developing the preliminary preferred land use concept. A

screening of the preliminary land use concepts is to be undertaken in Phase 1 to determine a preliminary preferred concept(s) for impact assessment in Phase 2.

The Phase 2 Impact Assessment work will be completed concurrently to the other component studies such as the Transportation Master Plan, and Water / Waste Water Master Servicing Plan, which will also be assessing the impacts and requirements of the preliminary preferred land use concept.

The intent of Phase 2 is to assess the impacts of the preliminary preferred land use concept and inform the preliminary establishment of initial management strategies which:

- protect the critical elements and systems of the subwatershed and local drainage system;
- prevent environmental degradation;
- provide adequate flexibility for integration with adjacent development and redevelopment
- areas;
- assist in the establishment of open space linkages;
- identify opportunities and constraints to development;
- provide a strategy to manage existing land uses;
- detail preliminary locations and areas for stormwater management (LID BMPs and end-of-pipe
- facilities); and
- identify restoration and enhancement opportunities.

In Phase 2, a detailed analysis shall be completed to assess the impacts of future land use changes in the Secondary Plan Area. Various options and practices for mitigating these impacts shall be reviewed and management strategies to create net benefit shall be advanced. As noted, the assessment of future land use changes is premised on a 2-stage iterative approach whereby the feedback from the initial assessment shall be provided to the TAC. The impact assessment shall also consider the impacts of climate change to the Natural Heritage System and Water Resources System, and the manner in which the proposed development and management plan exacerbate or mitigate these impacts. In this regard, the impacts resulting from the proposed development and climate change are intended to be assessed in an integrated manner, rather than evaluating the impacts separately/individually.

The information from the Local SWS at this stage, will be considered along with the information from the concurrent transportation and servicing assessments to refine the preliminary preferred concept option(s) to eventually develop a preferred Secondary Plan.

The second iteration of impact assessment will be expected to be more scoped and focused on the specific changes to the land use and environmental impact management strategies. Hence the scope outlined in the following sections will need to be conducted twice, the first time will inherently be more complex and detailed than the second time. It is expected that the majority of the impacts and associated management and land use changes will have been captured as part of the first iteration

2.3.1 Hydrologic and Hydraulic Analysis

<u>Hydrology</u>

A hydrologic analysis shall be conducted for the initial future development land use concept to determine post- development flows, hydrographs and water balance (integrated with the groundwater assessment).

If Water Balance Assessments determine additional monitoring is required, costs associated with such additional monitoring, reporting and additional agency meetings associated with this extra work should all be provisional and are to appear as provisional price line items (per unit/install), separate from the upset limit pricing form. Potential monitoring installations and techniques (including labour) may include, but not limited to Piezometers, Monitoring Well, Rain Gauge, Staff Gauge, Flow Meter, Flume of Weir, Hydraulic Conductivity Tests, and/or Boreholes.

The existing conditions hydrologic model shall be modified to reflect post-development conditions and executed continuously and in event mode to generate peak flows for all events ranging from 2, 5, 10, 25, 50, and 100 year, and the Regional Storm. As in the hydrologic analysis for existing conditions, the model results shall be reviewed by the TAC. The modelling will be used to determine the potential impacts on surface water, groundwater and water budgets. The Phase 2 Impact assessment hydrologic analysis will need to:

- Delineate a discrete drainage area plan based on potential future development;
- Calculate post-development flows for all event storms at predetermined locations, as per
- discretized drainage area plan and model schematic diagram within the study area. The post development flows shall be compared to existing flows for all storm events at the hydrologic
- nodes of interest;
- Conduct the water budget assessment at the nodes of interest coordinated with the
- Groundwater modelling (see below).
- Identify constraints related to imperviousness and intensity of development. Assess the
- requirement and/or performance of proposed stormwater management facilities including the
- potential approach for Regulatory flow impact management per the details outlined in the
- Regional Scoped SWS;
- Assess the future discharge impacts on the local systems and the broader creek systems;

The future development impact assessment should evaluate the impacts on both runoff volumes and peak flow rates.

Hydraulics

The existing hydraulic condition shall be reviewed in the context of the proposed development, with the land use changes, runoff increases and/or channel modifications. For those watercourses which may receive additional flow or perhaps require no controls, the study shall assess the impacts of the proposed development on watercourse water levels, flow velocities and water surface profiles for all storm events. Any potential erosion and/or flood risk concerns due to the proposed development shall be identified. Again, for any watercourses where flow would change, current flood line information shall be updated for post-development scenarios. The model results shall be reviewed and approved by the TAC.

The updated future land use flood lines (where changes are considered) are to be presented on the maps, with Regulatory Event flood line locations and cross sections identified with flood elevations. The overtopping depths, caused by the Regulatory Event, shall be assessed and documented on existing roads at all crossing structures. The flood plain maps should confirm the post-development flood levels are consistent with the current condition. Any changes in the flood inundation magnitude must be listed in inventory, with explanations of such changes. Any preliminary stormwater management strategies, required to match the post-development flows to existing conditions, shall be identified.

2.3.2 Hydrogeology

The hydrogeology analysis shall examine the impact of future development and land use changes on groundwater systems. An impact analysis is to be completed to evaluate the sensitivity of the groundwater flow system to changes in land use resulting from a potential reduction in recharge. Impacts are expected to include a decrease in the water table elevation, changes to stream flow (e.g. baseflow/groundwater discharge) and the potential degradation of groundwater quality. The hydrogeological component of the subwatersheds investigation shall:

- Ensure the groundwater sensitive areas are recognized and protected from future urbanizing and disturbances;
- Within the water balance assessment, update the overall groundwater budget model along with the surface water components for both existing and future scenarios; The water budget for the study area shall estimate precipitation, evapo-transpiration, runoff and infiltration, in addition to the groundwater recharge and discharge; and
- Take into account any relevant needs within the Source Water Protection Plan.

Integration with the hydrologic modelling and consistency of the various input parameters is required. It is understood the hydrologic and groundwater analysis may have some differences in the physical representation. The potential limitations should be reflected in the overall impact assessment.

The groundwater impact assessment should be integrated with the ecological component impact assessments as it relates to the groundwater function for discharge or water table depth.

2.3.3 Stream Morphology and Erosion Analysis

Erosion hazards as mapped and confirmed through Phase 1 will need to be evaluated against the proposed land use plan to ensure that area watercourses are protected from encroachment by development, but also to ensure that risk to property and infrastructure is minimized. Where realignments are proposed, and provided there is sufficient rationale, realignment alternatives should be evaluated through an integrated process with other members of the Study Team to maintain flood conveyance, habitat requirements, and linkages. Any realignment will require that appropriate erosion hazards and setbacks are delineated and mapped.

The continuous erosion analysis (see hydrologic assessment above) for the existing conditions shall be updated with the future development scenarios. Erosion potential for the study area shall be estimated by applying erosion thresholds to the existing channel / bank conditions using the post-development flows. This analysis is to be completed for the same cross sections that were assessed as part of the detailed geomorphological assessment. Appropriate mitigation measures shall be recommended for sections showing a significant increase in erosion potential. Erosion thresholds shall be used to establish discharge rates for stormwater management systems for the proposed development to ensure there is no increase in downstream erosion. This process will

involve determination of the impacts without mitigation and then defining the necessary levels of control in an iterative manner to ensure downstream systems are appropriately protected.

Based on the results presented in Phase 1, identify which watercourses and headwater drainage features in the proposed development area are stable and have sufficient conveyance capacity, and which watercourses and headwater drainage features need restoration or alteration through natural channel design approaches. Stream morphology shall be assessed downstream of future development areas, with a focus on the existing and potential erosion concerns. Existing and future development impacts shall be evaluated with the development strategy indicated to limit the negative impacts, while accommodating opportunities to restore and improve the existing channel status. This will need to consider those watercourses and HWDFs which are to remain on the landscape versus those which can be removed subject to appropriate management practices.

For areas of new development, the size of the channel block necessary to allow natural channel design to occur shall be determined. The sizing will include the meander belt, hydraulic criteria, fisheries setbacks and Natural Heritage System planning, and all buffers and setbacks. The natural channel design information on which the preliminary assessments are made, shall be documented for use at the next stages of planning (i.e. neighbourhood scale). The natural channel design strategy must clearly define that all channel blocks have the ability to convey flows associated with the Regulatory event. As noted, the size determination should be made based on stream morphology, in addition to the considerations of aquatic and terrestrial features and setbacks. The determination of which watercourses and HWDFs are to be maintained and which are to be considered for relocation or removal, needs approval of the TAC. The Conservation Authority and Fisheries and Oceans Canada and others will ultimately need to be consulted for any recommended channel works.

2.3.4 Aquatic Environment

Assess the potential impacts of future land uses on the aquatic resources. Recommendations shall be identified for improvement of aquatic habitat, including in-stream, stream bank and flood plain habitat enhancement, removal of barriers and on-line ponds, and retrofitting existing altered habitats. The assessment shall relate physical characteristics and processes of the aquatic environment to biological communities. The assessment shall also identify and protect appropriate buffers/setbacks, and linkage of these habitats, which reflect the specific stream sensitivity and required buffer functions.

Detailed assessment shall be generally focused on the significant areas identified in Phase 1 and areas immediately downstream of proposed new developments. Considerations should be given to Low Impact Development approaches. Along with the Stream Morphologist, the Aquatic Ecologist must consider HWDF management.

2.3.5 Terrestrial Assessment

The Study Team is to investigate potential land use impacts on the terrestrial features. Appropriate buffers/setbacks should be identified in order to protect the natural heritage features and functions from disturbance. In addition, potential linkages (natural areas that ecologically connect core areas) shall be identified and protected. Linkages are important in reducing the potential adverse impacts of habitat fragmentation on natural areas. The management strategies shall be documented regarding the protection of these sensitive resources and functions. Linkage and buffer alternatives, should be presented in maps to:

- Identify successional habitat that are restoration areas within the Natural Heritage System;
- Identify habitat features that will be retained as part of the Natural Heritage System due to their quality.

The assessment shall generally focus on the sensitive areas identified in Phase 1 and areas in the immediate vicinity of new developments. Where a continuous ELC-defined vegetation community extends beyond the subject areas, the assessment shall generally address the entire community, including portions beyond the study area boundaries.

2.3.6 Surface Water Quality

The successful consultant shall investigate potential land use impacts and develop strategies to maintain or enhance in-stream water quality. Actions to address existing point and non-point sources of pollution resulting in degraded water quality shall be developed. Best Management Practices (BMPs) for urban stormwater management shall be recommended for all new development to address stormwater quality. The proposed BMPs shall be in accordance with the requirements of the MECP and local agencies including the Provincial guidance which focuses on a treatment train approach using LID BMPs.

2.3.7 Phase 2 Report – Impact Assessment

At the completion of the Phase 2 1st Iteration and 2nd Iteration Stages, Reports will need to be prepared (i.e. one for each iteration) outlining the results of the Impact Assessment. These Reports shall be submitted to document the results of the impact assessment and the preliminary evaluation of the stormwater management options and recommended subwatershed management strategies as they relate to the proposed development. The water (surface/ground) modelling input and output files shall be appended to this report. In addition, constraints and opportunities present in the study area, in terms of urban expansion, environment impacts and protection, shall be clearly documented with GIS maps for the associated locations.

Note: It is expected that a Draft Table of Contents will be submitted for review and comment well in advance of the Draft Report submission. A minimum of three weeks should be allowed for submission of comments on all submitted deliverables, including Draft and Final Report.

2.4 Phase 3 – Management, Implementation and Monitoring Plan

Phase 3 shall identify and set the framework for implementation and monitoring of the preferred subwatershed's management strategy building from the results of the second iteration land use impact assessment. Management recommendations are required to address the objectives identified in the Study Area Boundary Expansion Scoped Subwatershed Study as well as the goals, objectives and targets from the parent watershed plan for the respective Secondary Plan Areas. A Management, Implementation, and Monitoring Plan shall be developed, which sets out the requirements for phasing, financing, operation of facilities, and monitoring to ensure the future development(s) are in compliance with the approved Subwatershed Study and Secondary Plan Policies. The Phase 3 work will be completed when a preferred community structure plan has been determined. The findings of this study will provide a technical framework for future infrastructure works, and support the future development proposals in accordance with the approved Secondary Plan.

Watercourse management recommendations will be made at the reach scale and based on an integrated characterization of feature constraints, with site-specific opportunities presented as

appropriate. Management recommendations and opportunities are to be developed in consultation with the Study's TAC, with agreement prior to study conclusion.

Phase 3 will provide the detailed subwatershed management strategy for the proposed development, based on the evaluation of a range of subwatersheds management options through Phase 2 and based on the preliminary subwatershed goals, objectives and targets, established in Phase 1. The stormwater management strategy outlines the siting for various components of the overall stormwater management plan, including key locations for siting and general guidance for selecting green infrastructure and LID BMPs to manage the Natural Heritage System and Water Resources System. The scope for additional studies will also be identified that are to be completed in support of future Draft Plans of Subdivisions or Condominium, and Site Plans as required, to meet the objectives and targets of this Subwatershed Study. The Subwatershed Study is to identify preliminary locations for logical development blocks drainage sheds for consideration as part of future plans. The scope for additional studies should include requirements to complete hydrologic and/or hydraulic modelling to verify the stormwater management criteria established in the higher-level studies based upon more detailed information, and revise/refine the criteria as required.

Groundwater

Management strategies are required that will reflect the local and functional linkages of sensitive recharge and discharge areas, the potential groundwater quantity impacts on the private wells and groundwater quality degradation.

Groundwater management strategies should include technical input (quantitative and qualitative) into the following:

- Determination or refinement of hydrogeologically sensitive areas relating to both recharge and
- discharge.
- Potential location and function of Stormwater Management facilities and other BMPs.
- Planning and policy recommendations for groundwater quantity and quality protection.

Phase 3 shall outline the agencies/organizations that are responsible for carrying out the various recommendations, and specify when in the development process the various recommendations need to be initiated. Phase 3 shall include:

- Timing and Phasing recommendations for the construction of any required facilities with respect to the future development; these recommendations will inherently need to consider the influence of other infrastructure as well;
- Asset Management Strategies such as:
    - A Phasing and Funding strategy for the construction and maintenance of the facilities;
    - A monitoring program to ensure compliance with the subwatersheds study, and a strategy for corrective actions which may be necessary based on results of the monitoring program;
    - Recommendations for future studies;
- An Adaptive Management and Monitoring Plan to monitor the subwatershed's response to land use change and suggest adaptive responses where impacts are being observed;

- Assist Secondary Plan Consultant with developing policies for consideration in the Secondary Plan;
- Time frame for the review/update of the Subwatershed Plan;

The Management, Implementation, and Monitoring Plan shall also recommend the phasing of development, and address climate change considerations. This will permit changes to recommend mitigation measures and management strategies for future phases of the development, in the case results of monitoring from the initial phases suggest that changes are warranted.

After all required modifications determined through final review have been addressed and approved, the final Subwatershed Study documents will be assembled and distributed to approval authority and made available to the public via the Project web page.

Note: It is expected that a Draft Table of Contents will be submitted for review and comment well in advance of the Draft Report submission. A minimum of three weeks should be allowed for submission of comments on all submitted deliverables, including Draft and Final Report.

Terms of Reference
Bridgeburg North Functional Servicing Report

February 2024

Functional Servicing Study

The Town is currently undertaking a Master Servicing Plan (MSP) and Wet Weather Management Strategy (WWMS) following the required Municipal Class Environmental Assessment processes that will inform Town-wide capital planning to accommodate future growth, in addition to informing the Town's Asset Management Plan and the Development Charges Study (all currently underway). The Region has recently completed the Regional Master Servicing Plan the finalized documents can be found using the following link: https://niagararegion.ca/projects/www-master-servicing-plan/

Depending on the timing of various milestones of the Functional Servicing Study (FSS) for Plan Area, it is important that the work being undertaken as part of this RFP be informed by work presently being undertaken with the active MSP. If timing permits, there will be opportunity to, in return, inform the MSP modeling, resulting in the most current projection of population / jobs feasible for both Plan Areas and by extension, produce a more reliable forecast to plan towards with capital improvements relating to these areas.

The Consultant will need to work cooperatively with the Town's Planning and Development Services and Infrastructure Services, the Town's Consultant, and Niagara Region on matters relating to the broader implications and impacts the Plan Area will eventually produce not only on the servicing side, but as they may relate to other master planning (Transportation Master Plan, Asset Management and Development Charge Study) and the subwatershed study work that is important for the stormwater management planning and water balance as part of the FSS. Municipal Water supply will also require examination and capacity planning in consultation with Regional and Town Infrastructure Services team for a fulsome FSS result and reporting.

The Proponent will understand and have a working knowledge of the policy and strategy framework (such as that of Niagara Region Official Plan Policy 3.2.3.3) that provides the guidance needed in the preparation of the FSS to support the secondary planning and satisfy the respective approval authorities. The following (non-exhaustive) list will assist Proponents in their consideration on the FSS component of this RFP:

Provincial Policy Statement: *(or potentially Provincial Planning Statement subject of Bill 97)*
https://www.ontario.ca/page/provincial-policy-statement-2020

A Place to Grow - Growth Plan for the Greater Golden Horseshoe (Growth Plan):
https://www.ontario.ca/document/place-grow-growth-plan-greater-golden-horseshoe

The Town of Fort Erie Subdivision Control Guidelines for Development of new Subdivisions, dated 2021;
https://www.forterie.ca/en/build-and-invest/resources/documents/Planning/planning-applications/2021-Subdivision-Control-Guidelines.pdf

Region of Niagara 2021 Water and Wastewater Master Servicing Plan Update, dated June 22, 2023, by GM BluePlan;
https://niagararegion.ca/projects/www-master-servicing-plan/default.aspx

Official Plan for the Town of Fort Erie, consolidated September 1, 2021;
https://www.forterie.ca/en/build-and-invest/official-plan.aspx

Niagara Peninsula Conservation Authority standards and regulations;
https://npca.ca/images/uploads/common/NPCA_Policy_Document_-_Nov_18_2022_Office_Consolidation.pdf

Erosion and Sediment Control Guidelines for Urban Construction, dated December 2006, prepared by the Greater Golden Horseshoe Area Conservation Authorities
https://npca.ca/images/uploads/common/ErosionandSedimentControl-Guidelines.pdf

MECP Stormwater Management Planning and Design Manual (2003, Updated 2019);
https://www.ontario.ca/document/stormwater-management-planning-and-designmanual-0

Niagara Region Pumping Station Policy – PWA 49-2010:
- ***See Attachment 1 - PWA 49-2010- Pumping Station Policy***

Niagara Region Stormwater Management Guidelines (2022);
https://niagararegion.ca/projects/stormwater-management-design-guidelines/pdf/finalreport.pdf

MECP Design Guidelines for Sewage Works (2008, Updated 2019); and
https://www.ontario.ca/document/design-guidelines-sewage-works-0

MECP Design Guidelines for Drinking-Water Systems (2008, Updated 2019).
https://www.ontario.ca/document/design-guidelines-drinking-water-systems-0
The Consultant will be responsible for confirming currency of publications referenced. The Functional Servicing Study will comprise three phases of study and reporting.

Phase 1 – Existing Conditions Report

The Consultant will be required to prepare detailed existing conditions report as the Phase 1 deliverable. The review will ensure the following details are captured in the Phase 1 findings and outlined in a comprehensive report that relates and aligns with any current and/or more recent investigations being undertaken and completed by Town consultants retained to complete the MSP and WWMS and TMP. The Existing Conditions Report will address at a minimum:

- Identification of all existing primary services in the immediate area including location, sizing, depths, and direction;

- Location of trunk, transmission and pumping stations that service the existing catchment area(s) and any available details on design / firm capacity and existing usage;
- Any existing stormwater facilities within the catchment area(s);
- Topographic base mapping for both Plan Area (from available data, field checked at key locations and confirmed with Town consultants working on MSP for consistency);
- Assessment of any available geotechnical information that would inform on soil types, depths, static water table and bedrock (if available); and
- Natural features representing constraints to servicing and development.

In addition to the reporting of the Phase 1 document, the Consultant will prepare mapping with the data supplied, gathered, or produced as appropriate, that illustrates existing service locations, drainage conditions, catchments, existing natural features and any other servicing related information useful in consideration while the Town is developing land use options.

The Phase 1 Existing Conditions Report will be reviewed by the Consultant's team and the Town and Region with further review for consistency with those outside consultants who may have contributed data and information in the preparation of the document.

Phase 2 – Land Use Options Assessment

The Phase 2 Report will provide cursory review and assessment of the land use options prepared during initial public consultation. The goal of the cursory assessment will be to provide general feasibility for each that may influence land use distribution, density and functional optimization when the Town prepares a preferred land use plan for all disciplines to use in their final reporting and recommendations.

The cursory review would make use of criteria developed by the Consultant's team, based on the above noted guidelines for design criteria, that would result in a pros and cons approach to the various functional advantages and/or disadvantages for each primary servicing and drainage outcome.

The Phase 2 Report will be subject of consultation with stakeholders, partner agencies and public as part of the open secondary planning process used by the Town in its effort to remain inclusive and inviting of commenting and feedback.

The Phase 2 Report will include mapping useful in public consultation and comprehension and, along with the Phase 1 Report, be public-facing documents accessible on the project web pages once completed and accepted by the Town.

Phase 3 – Preferred Land Use Plan - Functional Servicing Study

The Phase 3 Report will provide detailed assessment and recommendations as it relates to the primary servicing requirements to supply the Plan Area. The Phase 3 report will inform all aspects of primary servicing and drainage to carry forward the responsibilities of the development community at time of development applications. The

Town, in consultation with the Region and the Consultant, shall determine appropriate phasing plans for the Secondary Plan Area that will assist the Town with other key master planning activities and capital financing considerations. Options can be explored that may be feasible for modifying or expediting phasing activity where feasible, however such options would only be considered if a net benefit to the Town's financial position is proven (example being whether or not entertaining front-ending agreements would be in the best interest of the Town).

The Phase 3 Preferred Land Use Plan – Functional Servicing Study will supply the following detailed information, based on the preferred land use plan:

Storm Water Management and Drainage

- Stormwater Management criteria that are to be applied at time of design and application submission;
- Minor and major storm event planning impacts and determination on applicability of quality/quantity control, overland flow route conveyance and discharge;
- Stormwater Management facility locational criteria, sizing and related requirements such as maintenance access;
- Recommendations for improved infiltration, localized retention and climate change resiliency;
- Erosion and sediment control guidance;
- Recommended policies for secondary plan inclusion;
- Suggested conditions for development applications at time of development; and
- Cost estimates (denoting assumptions).

Municipal Water Supply

- Proposed distribution network (as appropriate for the secondary plan scale);
- Estimated demand resulting from proposed land use and applied densities;
- Recommendations relating to supply looping;
- Recommended policies for secondary plan inclusion;
- Suggested conditions for development applications at time of development; and
- Cost estimates (denoting assumptions)

Sanitary Servicing

- Identification of Town and Regional assets required to service the Plan Area and connection point to the Region's Waste Water Treatment Plant;
- Estimate of dry and peak flows expected.
- Town primary network location, sizing and depth (as appropriate for the secondary plan scale);
- Pumping station location and sizing if required
- Recommended policies for secondary plan inclusion;
- Suggested conditions for development applications at time of development; and
- Cost estimates (denoting assumptions)

The Consultant will be required to consult Town, Region and NPCA with respect to any standardized modeling requirements or digital standards that would result in any modification, augmentation or new data supply that may be useful to the respective parties, such as those occurring with the ongoing Town MSP and TMP preparation, baseline modeling and projection updates.

The draft Phase 3 Report will be compiled and circulated to Town and Regional staff for review and comment prior to broader circulation to responsible authorities for comment.

The completed Functional Servicing Study will be circulated to Town and Regional staff for review and comment prior to finalization. All phase-ending reports will be a public-facing documents to be made available on the Town's project web pages and required to be fully AODA compliant.

The Consultant's PM will ensure a responsible representative is available for public open house engagement who may be asked to present and receive questions in open forums.

Deliverables

Phase 1:

- Draft of the Existing Conditions Report and associated mapping
- Final Existing Conditions Report and associated mapping
- Presentation slides

Phase 2:

- Draft of the Land Use Options Assessment Report and mapping
- Final Land Use Options Assessment Report and mapping outlining pros and cons respecting each assessed option,
- Presentation slides

Phase 3:

- Draft of the Preferred Land Use Plan - Functional Servicing Study and mapping
- Final Preferred Land Use Plan – Functional Servicing Study and mapping
- Presentation slides
- Any database created or modified, digital mapping or digital modeling
- Meeting chronology, agenda and minutes

Niagara Region

REPORT TO: Chair and Members of the Public Works Committee

SUBJECT: Sewage Pumping Stations and Forcemains Policy
Proposed Policy Amendments

RECOMMENDATION(S)

That this Committee recommend to Regional Council:

That the current Sewage Pumping Stations and Forcemains Policy be amended, as presented in draft form in Appendix A.

EXECUTIVE SUMMARY

Regional Council previously adopted a Sewage Pumping Stations and Forcemains Policy (PWA 100-2005 dated May 31, 2005) regarding upper tier and lower tier ownership and responsibilities.

In the course of applying the Sewage Pumping Stations and Forcemains Policy since its implementation in 2005, it became apparent to staff that the current policy could be improved through review and refinement. Staff have completed a review and are proposing revisions to the policy to:

- Clarify responsibility for documenting the need for new pumping stations. The need for new stations is sometimes identified by the Region at the Master Servicing Plan level, but more often by the Local Area Municipality at the secondary plan stage, or through a development request.

- Clarify responsibility for the funding of new sewage pumping stations. This is becoming a significant issue as neither the Region nor area municipalities have included the cost of any new sewage pumping stations in their current respective Development Charge Background Studies.

- Clarify the basis by which a new pumping station is to be compared against the option of servicing by gravity sewer, by defining the process for carrying out a life cycle cost analysis.

It is the intent of the policy that the Region will ultimately own, operate and maintain pumping stations that are planned, funded, and constructed in accordance with the policy.

The proposed revisions to the Policy were reviewed with Public Works Officials from the Region and local area municipalities at a meeting on May 20, 2010.

FINANCIAL IMPLICATIONS

There are no immediate financial implications associated with this report but there are longer term financial implications associated with Regional ownership of additional facilities. These include increased operational, maintenance and capital reinvestment costs.

PURPOSE

The purpose of this report is to make recommendations for amending the Sewage Pumping Stations and Forcemains Policy.

BACKGROUND

Wastewater servicing in Niagara is operated under a two-tier system. The relative roles and responsibilities between the Region and area municipalities were initially defined in the 1969 MacLaren report carried out immediately prior to formation of the Region.

The Region was given responsibility for wastewater treatment. Ownership of sewers was based in part on the degree to which there were service connections, but primarily on capacity. The Region is generally responsible for sewers with a design capacity of 170 litres/second (peak dry weather flow). This size is characteristic to trunk systems with larger capacity to convey effluent from a large area to the wastewater treatment plant.

Regional responsibility for sewage pumping stations was based on whether the pumping station and forcemain discharged directly to a Regional trunk sewer or wastewater treatment plant. It would appear, however, that this criteria was not definitive, as it was not followed in subsequent years. Records show that the Region soon assumed other pumping stations and forcemains from the Ministry of the Environment and area municipalities, including some that discharged to local sewers. This pattern of transfer of ownership continued from 1970 to 2005 for both new and older stations. By 2005 the Region owned about 80% of all municipal sewage pumping stations.

Regional Council previously adopted a Sewage Pumping Stations and Forcemains Policy (PWA 100-2005 dated May 31, 2005) regarding upper tier and lower tier ownership and responsibilities. This included agreeing to transfer to the Region all of the 23 sewage pumping stations remaining in the hands of the local municipalities. The majority of these stations have since been transferred to the Region. There are a few, however, which have not been transferred, either because they have not met the requirement that they first be upgraded to Regional standards, or because the land cannot be transferred as it is owned by a third party.

REPORT

In the course of applying the Sewage Pumping Stations and Forcemains Policy since its implementation in 2005, it became apparent to staff that the current policy could be improved through review and refinement. The reasons for proposing amendments to the current policy include:

- Responsibility for documenting the need for new pumping stations is not clear. The need for new stations is sometimes identified by the Region at the Master Servicing Plan level, but more often by the Local Area Municipality at the secondary plan stage or through a development request.

- Responsibility for the funding of new sewage pumping stations is not clear. This is becoming a significant issue as neither the Region or area municipalities have included the cost of any new sewage pumping stations in their respective Development Charge Background Studies.

The need for a new pumping station should be compared to the option of servicing by gravity sewer on the basis of a lifecycle cost analysis. While it may be less expensive initially to build a pumping station, over the life cycle of the infrastructure, a gravity sewer may have a better net present value. The amended policy clarifies the criteria on which the cost analysis is to be based.

The proposed amended policy is based on the following statements:

- Gravity sewers are the most reliable method of transferring sewage from the sanitary collection system to wastewater treatment facilities.

- There are limitations to the practical depth of gravity sewers such that new pumping stations will be only allowed where it can be shown that pumping is a more cost effective and feasible option than gravity.

- The need for a new pumping station, as well as an assessment of capacity of the downstream infrastructure, must be documented in engineering and/or planning studies such as Wastewater Master Servicing Plans carried out by the Region and/or Area Servicing Plans prepared by a Local Area Municipality.

- The cost for a new pumping station required to accommodate growth is to be included in the applicable Development Charges bylaw, either the Region's or the Local Area Municipality's.

The purpose of the proposed amended policy is to:

- Minimize the overall lifecycle costs associated with conveying sewage to wastewater treatment plants.

- Minimize the risk of basement flooding and the risk of spills to the environment associated with conveying sewage to wastewater treatment plants.

- Define a decision making process to detrmine when an area is to be serviced by gravity sewers versus a pumping station.

- Delineate roles and responsibilities between the Region and local area municipalities for funding of new pumping stations.

- Define procedures under which the Region will assume ownership of an existing pumping station currently owned by a local area municipality.

- Define procedures under which the Region will operate and maintain sewage pumping stations on behalf of local area municipalities.

- Minimize the number of sewage pumping facilities by ensuring that new stations are designed for the maximum drainage area that can be serviced by incoming gravity sewers.

It is the intent of the proposed amended policy that the Region continue to own, operate and maintain pumping stations that are planned, funded, and constructed in accordance with the policy.

The proposed revisions to the Sewage Pumping Stations and Forcemains Policy were reviewed with Public Works Officials from the Region and local area municipalities at a meeting on May 20, 2010. The key concern raised at the meeting was from a public works official who questioned whether or not the proposed policy was in compliance with the Development Charges Act. The concern was specific to the matter of an area municipality including the cost of a new pumping station in their development charges with the intent of turning ownership over to the Region following expiration of the one year construction warranty period. This question was subsequently directed to Mr. Cam Watson of Watson and Associates who reviewed the matter and expressed the opinion that this approach is appropriate.

Submitted by:

Kenneth J. Brothers, P. Eng.
Commissioner of Public Works

Approved by:

for Mike Trojan
Chief Administrative Officer

Attachments
This report was prepared by Peter Baker, P. Eng., Associate Director of Water & Wastewater Engineering, and Betty Mathews-Malone, P. Eng., Director Water & Wastewater Services

APPENDIX A

PUBLIC WORKS POLICY MANUAL

SECTION	NAME OF POLICY
WATER AND WASTEWATER	**SEWAGE PUMPING STATIONS AND FORCEMAINS**

DEVELOPED BY: PUBLIC WORKS DEPARTMENT

APPROVED BY: DATE:

EFFECTIVE DATE: July 1, 2010 LATEST REVISION: May 19, 2010

POLICY STATEMENT:

Gravity sewers are the most reliable method of transferring sewage from the sanitary collection system to wastewater treatment facilities as the risk of sewer collapse or blockage is lower than the risk of pumping station mechanical failure or loss of electrical power. In addition, the life cycle cost of a sewer is generally lower than that of a pumping station.

Given that there are limitations to the practical depth of gravity sewers, new Pumping Stations will be considered in situations where it can be shown that pumping is a more cost effective option than gravity.

The need for a new pumping station, as well as an assessment of capacity of the downstream infrastructure, must be documented in engineering and/or planning studies such as the Wastewater Servicing Plans carried out by the Region and/or Area Servicing Plans prepared by the Local Area Municipality.

The cost for a new pumping station required to accommodate growth is to be included in the Development Charges bylaw of the Region or Local Area Municipality in accordance with the roles and responsibilities regarding funding defined in this Policy.

The Region will ultimately own, operate and maintain new pumping stations that are planned, funded, and constructed in accordance with the policy. Unless directed otherwise by a resolution of Regional Council, the Region shall not:

- Fund any new pumping station or assume ownership of any existing pumping station from an area municipality that does not meet the requirements of this policy.
- Operate or maintain any pumping station located on private property (with the exception of stations covered by existing agreements).

- Operate or maintain any privately owned pumping station.
- Fund or assume ownership of any interim (i.e. temporary) pumping station.

This amended policy supersedes the previous Sewage Pumping Stations and Forcemains policy that was approved by Regional Council May 31, 2005 (PWA 100-2005) and came into effect September 1, 2005.

PURPOSE

The purpose of this policy is to:

- Minimize the overall lifecycle costs associated with conveying sewage to wastewater treatment plants.
- Minimize the risk of basement flooding and the risk of spills to the environment associated with conveying sewage to wastewater treatment plants.
- Define a decision making process for when an area is to be serviced by gravity sewers versus a pumping station.
- Delineate roles and responsibilities between the Region and local area municipalities for funding of new pumping stations.
- Define procedures and conditions under which the Region will assume ownership of an existing pumping station currently owned by a local area municipality.
- Define procedures under which the Region will operate and maintain sewage pumping stations on behalf of local area municipalities.
- Minimize the number of sewage pumping facilities by ensuring that new stations are designed for the maximum drainage area that can be serviced by incoming gravity sewers.

DEFINITIONS

In this policy, the following definitions shall apply:

a. **"Region"** shall mean the Regional Municipality of Niagara

b. **"MOE Design Guidelines"** shall mean the most current edition of the Ontario Ministry of the Environment Design Guidelines for Sewage Works.

c. **"Regional Design Standards"** shall mean the most current version of the Region's Public Works Department Project Design and Technical Specifications Manual and includes the Region's most current SCADA standards, Process Control Narratives and Security Standards.

d. **"Life-cycle costs"** shall mean all costs associated with the planning, development, approvals, design, construction, operation and maintenance of the new asset throughout its expected life.

e. **"Pumping Station"** shall mean sanitary sewage pumping station.

f. **"Forcemain"** shall mean the pressure pipe conveying sewage from the Pumping Station to the downstream collection system or wastewater treatment plant.

g. **"Maximum Drainage Area"** shall mean the maximum area within an Urban Area Boundary that can be cost effectively serviced by a single pumping station in conjunction with incoming gravity sewers. The Maximum Drainage Area shall include areas beyond the Urban Area Boundary where there is a reasonable expectation that the boundary will be expanded in the future, but in no way shall be deemed as supporting an urban boundary expansion.

h. **"Wastewater Master Servicing Plan"** shall mean a report which documents current wastewater flows and Regional infrastructure capacities and forecasts future flows and Regional infrastructure requirements based on population and employment growth projections.

i. **"Area Servicing Plans"** shall mean plans such as Secondary Plans, or drainage area specific servicing plans which are prepared to address the development or redevelopment of large areas of land or neighbourhoods and include servicing studies identifying both local and Regional infrastructure requirements and constraints.

j. **"Urban Area Boundary"** shall mean as defined by the Region's Policy Plan and by Local Area Municipality Official Plans.

k. **"Dry Weather Flow"** flows shall mean sewage flows experienced during a period of dry weather

l. **"Wet Weather Flows"** shall mean sewage flows experienced during and following periods of wet weather and/or snowmelt during which the flows are significantly influenced by inflow/infiltration.

m. **"Interim Sewage Pumping Station"** shall mean a facility that is intended for the short term only with the understanding that it will be replaced in the longer term with a gravity sewer and/or a pumping station that services a larger drainage area.

n. **"Combined Sewers"** shall mean sewers that include both road drainage (catch basins) and private property connections (which may include foundation drain and/or roof leaders).

o. **"Partially Separated Sewers"** shall mean sewers which do not have road drainage (catch basin) connections but have foundation drain and/or roof leader connections.

DESCRIPTION

ESTABLISHMENT OF NEW SEWAGE PUMPING STATIONS

The need for a new pumping station must be documented in engineering and/or planning studies such as the Wastewater Servicing Plans carried out by the Region and/or Area Servicing Plans prepared by the Local Area Municipality. The study is to assess the impact of the proposed flows on the downstream wastewater infrastructure, including sewers, pumping stations and treatment plants.

Where a new sewage pumping station is proposed by a local area municipality, a detailed life-cycle cost comparison between a sewage pumping station and a gravity sewer must be submitted to the Region by the municipality. Life cycle cost comparisons shall be undertaken as outlined in Schedule A to this Policy. No pumping station shall be constructed where, in the opinion of the Region, the construction of a gravity sewer is a viable and cost effective alternative.

For all new pumping stations and forcemains, consideration shall be given to a catchment area that would meet the ultimate build-out needs of the Maximum Drainage Area that could be serviced by incoming sewers.

Each proposed forcemain will be evaluated with regard to the potential for transient pressures and for odour and corrosion problems. The project design shall include pressure relief and odour and corrosion prevention measures as required. Where it is not possible to address these issues to the Region's satisfaction then further consideration will be given to a gravity solution and the degradation of downstream infrastructure will be included in the life cycle cost analysis.

All new pumping stations and forcemains shall be designed and constructed in accordance with current MOE Design Guidelines and current Regional Design Standards. New forcemains will not be allowed to discharge to existing forcemains.

Niagara Region approvals for new pumping stations proposed by a local area municipality shall be obtained in accordance with the procedures outline in this policy. The Region will deal directly with the local area municipality in following these procedures and will not deal directly with any third party that may have an interest in the new station. Any cost sharing agreement involving a third party shall be with the local area municipality.

The Region will assume ownership of a new pumping station from a local area municipality when the requirements of this policy have been met, including the following specific criteria:

i. a resolution is passed by the local municipal council to begin the transfer of ownership of the station to the Region;
ii. the station meets the MOE Design Guidelines and the Regional Design Standards;
iii. the design capacity of the station includes an allowance for inflow/infiltration (i.e. wet weather flows) to the satisfaction of the Region. In the case of new development, the allowance for Infiltration shall be as per the MOE Design Guidelines and Regional Design Standards. In the case of existing developed areas, the allowance for wet weather flows shall be decided on a case by case basis taking into consideration whether the area is serviced by combined, partially separated or fully separated sewers. In general, the Region will not allow the diversion of flows from an existing developed area to a new station where the existing peak wet weather flows from that developed area are more than two times existing peak dry weather flows (based on actual measurements from flow monitoring devices). The Region reserves the right not to allow flows to a new station from an existing area until inflow/infiltration is reduced to an acceptable level through sewer separation projects and/or other inflow/infiltration reduction measures.
iv. any and all construction contract deficiencies have been addressed to the satisfaction of the Region;
v. the appropriate Equipment and Operating Manuals have been received by the Region;
vi. a set of as-built drawings has been provided to the Region;

vii. the warranty period of any attached equipment has expired;
viii. the property, including the station and associated forcemain is transferred to the Region;
ix. the Ministry of the Environment Certificate of approval has been amended to reflect the change in ownership.
x. the region will only accept the property transfer, from private properties in Fee Simple, and must include access to a road and enough property for future expansion;
xi. for those situations wherein a pumping station is on public lands, the Region will consider accepting ownership of the pumping station subject to an easement agreement with the property owner;
xii. a resolution has been passed by Regional Council to assume ownership of the station.

REGIONAL ASSUMPTION OF OWNERSHIP OF EXISTING PUMPING STATIONS

The Region will consider assuming ownership of an existing pumping station that is currently owned by a local area municipality on a case by case basis. The Region will assume ownership of a pumping station that existed prior to the date that this revised policy comes into force when the requirements of this policy have been met, including the following specific criteria:

a. a resolution is passed by the local municipal council to begin the transfer of ownership of the station to the Region;
b. the station is upgraded as required at the expense of the local area municipality to meet the MOE Design Guidelines and the Regional Design Standards;
c. existing wet weather flows (i.e. inflow/infiltration) to the station are at levels considered to be acceptable to the Region as decided on a case by case basis taking into account whether the drainage area is serviced by combined, partially separated or fully separated sewers. In general, the Region will not assume ownership of an existing pumping station where the existing peak wet weather flows to the station are more than two times existing peak dry weather flows (based on actual measurements

from flow monitoring devices). The Region reserves the right not to assume ownership of an existing pumping station until inflow/infiltration is reduced to an acceptable level through sewer separation projects and/or other inflow/infiltration reduction measures.

d. any and all construction contract deficiencies have been addressed to the satisfaction of the Region;
e. the appropriate Equipment and Operating Manuals have been received by the Region;
f. a set of as-built drawings has been provided to the Region;
g. the warranty period of any attached equipment has expired;
h. the property, including the station and associated forcemain is transferred to the Region;
i. the Ministry of the Environment Certificate of approval has been amended to reflect the change in ownership.
j. the region will only accept the property transfer, from private properties in Fee Simple, and must include access to a road and enough property for future expansion;
k. for those situations wherein a pumping station is on public lands, the Region will consider accepting ownership subject to an easement agreement with the owner;
l. a resolution has been passed by Regional Council to assume ownership of the station.

INTERIM PUMPING STATIONS

A local area municipality may establish a new interim (i.e. temporary) pumping station as a short term solution to facilitate servicing of a smaller development area where a larger pumping station and/or gravity sewer is required over the longer term to service additional lands (i.e. the maximum drainage area). The Region will not fund or assume ownership of any interim pumping station nor assume ownership of multiple pumping stations servicing the maximum drainage area.

OPERATION AND MAINTENANCE OF NON-REGIONALLY OWNED PUMPING STATIONS

The Region, at its discretion and without prejudice, may operate and maintain any pumping station owned by a local area municipality at the request of the local area municipality. Operation and maintenance of any non-regionally owned pumping station shall be in accordance with a written agreement executed by both the Region and the local area municipality. The Region will charge fees as detailed in such an agreement to cover its costs for the operation and maintenance of the station. The Region may cease operating and maintaining a pumping station should the requirements of the agreement not be met or in accordance with the termination clause of any such agreement. Any improvements or upgrades of the non-regionally owned stations shall be at the expense of the local area municipality whether undertaken by the Region or its agents as outlined in the agreement.

The Region will not operate or maintain any privately owned pumping station.

FINANCIAL RESPONSIBILITIES

The local area municipality will be responsible for the cost of any new pumping station with a design capacity of less than 170 litres per second peak dry weather flow.

The Region will be responsible for the cost of any new pumping station with a design capacity of equal to or greater than 170 litres per second peak dry weather flow.

In cases where it will be necessary for an existing Regional gravity sewer to be upgraded or a new Regional gravity sewer to be constructed to receive the sewage from the pumping station forcemain, and such works are not planned within the required timelines, the proponent may choose to "front end" the cost of the upgrade. The proponent shall receive credit for such upgrades as specified in an executed agreement between the proponent and the Region.

Schedule A

Life Cycle Cost Comparison (Pumping Station vs. Gravity Sewer)

The life-cycle cost comparison between the sewage pumping (PS) option and the gravity sewer option is to be based on the component cost breakdown and component lifespan shown below. This table is based on the Region's Tangible Capital Assets Policy and was developed for purposes of compliance with Public Sector Accounting Board (PSAB) 3150 requirements.

Pumping Station Component	% of initial capital cost		Lifespan in years
	Wet Well/Dry Well	Submersible	
Building Architectural	10%	6%	20
Building Mechanical and Electrical	20%	16%	20
Building Structural	30%	17%	60
Process Electrical	8%	12%	30
Process Instrumentation	2%	6%	10
Process Piping & Equipment	26%	36%	20
Site Works	4%	7%	25

% of initial capital cost	Linear Component (gravity sewer or forcemain)	Lifespan in years
100%	Linear Piping	75

Calculation

The net present cost of each option is to be calculated as outlined below and as shown in the example provided.

1. Evaluate life cycle costs on the basis of a 75 year project life.
2. Multiply each component's proportional cost by the asset's total capital cost estimate and the project lifespan divided by the component lifespan. Sum the results for each component.
3. Include annual property taxes, utility costs (electrical, water, fuel, phone/SCADA) and misc. annual O&M costs (1% of PS capital cost) for the pumping station option.
4. Do not include annual Operation and Maintenance (O&M) costs for the forcemain and gravity sewer as they are assumed to be offsetting.
5. Assume that the rate of inflation equals the rate of return on investments.

Example – wet well/dry well PS versus gravity sewer:

Pumping Station (PS) capital cost estimate:	$600,000
Forcemain capital cost estimate:	$700,000
Gravity Sewer capital cost estimate:	$3,500,000
Annual property taxes on PS (estimated):	$3,000
Annual PS utility cost estimate (estimated):	$12,000
Annual misc. PS O&M costs (1% of PS capital cost)	$6,000
Anticipated project life:	75 years
Net present cost of PS/Forcemain (see below):	$4,042,000
Net present cost of Gravity Sewer:	$3,500,000

Net Present Cost of PS/Forcemain Calculation:

Component	Contribution	Cost
Building Architectural	10% x $600,000 x 75years/20 years	$225,000
Building Mechanical and Electrical	20% x $600,000 x 75years/20years	$450,000
Building Structural	30% x $600,000 x 75 years/60 years	$225,000
Process Electrical	8% x $600,000 x 75 years/30 years	$120,000
Process Instrumentation	2% x $600,000 x 75 years/10 years	$90,000
Process Piping & Equipment	26% x $600,000 x 75 years/20 years	$585,000
Site Works	4% x $600,000 x 75 years/25 years	$72,000
Forcemain	100% x $700,000 x 75 years/75 years	$700,000
Annual expenses	($3,000 + $12,000 + $6,000)/year x 75 years	$1,575,000
Total		$4,042,000

Terms of Reference
Bridgeburg North Land Use Compatibility Study

February 2024

Land Use Compatibility Study

The Plan Areas subject of this RFP will be reviewed in relation to the surrounding land uses that could influence “community” land use decisions of the respective Plan Area. The Plan Area was added as “Community Lands” through an urban boundary expansion exercises and can be expected to develop with residential prominence. To a lesser extent, population related employment (commercial and institutional use) may also result for portions of the Plan Area.

Phase 1 – Existing Conditions

An initial assessment will be completed that identifies:

- All potential sources of incompatibility from outside sources on sensitive land uses within the Plan Areas; and
- Identifies existing and potential areas of influence (if applicable) that will need consideration during land use planning exercises.

The Existing Conditions Report will be prepared to provide identification and awareness of potential for incompatible land use impact (if determined to have influence). The Report will be circulated for review and comment to Town staff prior to finalization. The updated Report will be a public-facing document and made available on the Town’s project web pages.

Phase 2 – Land Use Compatibility Impact Assessment

Once a preferred land use plan has been determined, a more detailed land use compatibility review will be performed that provides any recommendations for incorporation into policy of the respective Secondary Plan. This would include policy for additional study requirements at the time of detailed design and development application stages.

The Consultant will make use of the following documents, Acts and Regulations when assessing land use compatibility:

- The Provincial Policy Statement *(or Provincial Planning Statement 2023)*
- Environmental Protection Act
- Town of Fort Erie Official Plan
- Ontario Regulation 419/05 (air quality)
- NPC-300 (environmental noise)
- MECP D-series Land Use Compatibility Guidelines

Potential external sources for investigation include existing and planned aggregate operations, existing and planned industrial or commercial uses, active railways, Q.E.W. proximity (500 metre influence area), and boundary arterial roads.

The completed Land Use Compatibility Study will be circulated to Town staff for review and comment prior to finalization. All phase-ending reports will be a public-facing document to be made available on the Town’s project web pages and required to be fully AODA compliant. The Consultant’s PM will ensure a responsible representative is

available for public open house engagement who may be asked to present and receive questions in open forums.

For information and reference with respect to study expectations, the following Niagara Region document is provided for consideration of Proponents in preparation of proposals that satisfy the municipal level detail suitable for secondary planning and policy development:

Niagara Region sample Land Use Compatibility Study Terms of Reference:

See Attachment 2 - Niagara Region TOR for Land Use Compatibility 2022

Deliverables

Phase 1:

- Draft Existing Conditions Report identifying all existing and potential/planned sources of potential conflict and mapping to illustrate including actual or potential influence areas
- Final Existing Conditions Report identifying all existing and potential/planned sources of potential conflict with mapping to illustrate including actual or potential influence areas
- Presentation slides

Phase 2:

- Draft Land Use Compatibility Study assessed against preferred land use option with mapping and recommendations of any mitigation measures and identifying any additional study required at the time of development applications
- Final Land Use Compatibility Study assessed against preferred land use option with mapping and recommendations of any mitigation measures and identifying any additional study required at the time of development applications
- Presentation slides
- Any database created or modified, digital mapping or digital modeling
- Meeting chronology, agendas and minutes

Land Use Compatibility Study Terms of Reference

Description

A Land Use Compatibility Study is a technical report that provides a written description of the land use compatibility of sensitive land uses, where permitted or proposed adjacent to, or near to industrial uses; or within the influence area of major facilities; or in proximity to transportation and utility sources.

The report will identify any existing and potential land use compatibility issues and will identify and evaluate options to achieve appropriate design, buffering and/or separation distances between the proposed sensitive land uses and existing uses.

This report will be used to assist Regional staff in making recommendations concerning the proposed sensitive land uses, and may be peer reviewed by the Region at the cost of the applicant.

The report will:

1. Provide a written description of:
    - any potential land use compatibility impacts by type (i.e.: traffic, noise, vibration, and emissions, including dust and odour) and the severity, frequency and duration of such impacts, as may be appropriate for each type;
    - the history of any complaints received by the municipality and/or MOECP within the immediate area of the proposed development;
    - the potential land use compatibility issues the proposed development may create. Impacts shall be considered based on the potential:
        - effects on major facilities' compliance with applicable environmental policy, regulations, approvals, authorizations and guidelines, including the noise provisions of local by-laws;
        - increased risk of complaint and nuisance claims;
        - operational constraints for major facilities;
        - constraints on major facilities to reasonably expand, intensify or introduce changes to their operations;
        - constraints for new major facilities to reasonably be established on lands in proximity to the development that are designated for employment uses;
        - the extent of non-compliance with land use separation requirements for existing employment uses in the vicinity, including propane storage and distribution facilities, if applicable; and,
    - the extent to which the applicant of the proposed development and businesses within the nearby industrial, utility, transportation and/or major facilities have exchanged relevant information. This would include the written undertakings given to affected businesses that any information regarding their processes, emissions data and expansion plans not already part of the public record would be treated on a confidential basis.

2. Identify and evaluate options to achieve appropriate design, buffering and/or separation distance to prevent or mitigate potential adverse effects from traffic, noise, vibration, and emissions. This would include details on the following:
    - At-Source Mitigation: Technology that businesses in *Employment Areas* and/or major facilities may consider implementing to mitigate adverse effects;
    - Buffers: Physical structures, building design elements or distance separation that could be incorporated into the site design of the proposed sensitive land uses, including residential uses, to mitigate adverse effects and negative impacts;
    - At-Receptor Mitigation: Technologies, building materials, design features etc. that could be incorporated both on-site and within the built structure of proposed sensitive land uses, including residential uses, to mitigate negative impacts and adverse effects; and
    - Other: Any other potential techniques, strategies and approaches not identified above, including but not limited to, warning clauses, environmental easements, agreements with major facilities to secure at-source and at-receptor mitigation and classifying lands as a Class 4 Area in accordance with the requirements of the MOECP "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning Publication NPC-300", as amended or replaced from time to time.
3. Provide details of assessment criteria.
4. Provide details regarding the methodology used and assessment locations.
5. Discuss how the proposed development is consistent with the Provincial Policy Statement, is in accordance to the *Planning Act* (as amended), and conforms to The Growth Plan for the Greater Golden Horseshoe and The Greenbelt Plan, as it applies to the planning and development of sensitive land uses in proximity to industrial, utility and transportation uses.
6. Recommended methods to secure the necessary mitigation to guarantee that such mitigation is installed, performs as intended and will be maintained to ensure land use compatibility.

The study is to be prepared on behalf of the applicant by a Consultant (or Consultants) that is/are fully accredited, qualified and/or certified in the relevant matters being evaluated and recommended (for example air quality assessments should be performed by an engineer fully accredited in such field, etc.).

When Required

A study may be required to justify sensitive land uses where permitted or proposed adjacent to or in proximity to industrial, transportation, and utility sources:

- Official Plan Amendment
- Zoning By-law Amendment
- Subdivision Application

- Site Plan Control
- Consent Application

During pre-application consultation, Regional staff will work with the applicant and the applicant's consultant(s) to determine if such a Study is required and, if so, the specific requirements of the Study, based on the nature of the proposed application and the context of the study area.

Peer Review

The objective of the peer review is to provide staff with an independent, expert, third party assessment of the potential land use compatibility issues as well as the proposed mitigation measures. The purpose is to assist in making fully informed land use planning recommendations.

The peer reviewer will provide, at the cost of the applicant, an assessment of the report and whether appropriate methodology and data have been applied to the analysis, as well as an evaluation of the recommended mitigation measures and conclusions. The peer reviewer may request updates to the study as needed to satisfy Niagara Region and the Local Area Municipality that the report is complete and adequately addresses any potential land use compatibility concerns.

Terms of Reference
Bridgeburg North Oil & Gas Analysis, Phase 1 ESA, and Archaeological Assessment

February 2024

Oil and Gas Analysis

As per the Regions requirements.

Phase 1 Environmental Site Assessment (ESA)

The Phase 1 ESA shall follow Ontario Regulation 153/04.

A Letter of Reliance from a Qualified Professional shall also be provided stating that both the Town and Region may rely on the information contained within the report.

Archaeological Assessment

A Stage 1 Archaeological Assessment (at minimum) by a licensed archaeologist for any development and/or site alteration within an area of archaeological potential.

A Ministry's acknowledgement letter of receiving the report shall also be submitted for Stage 1.

If a Stage 2 Archaeological Assessment is warranted; consultation with the Mississaugas of the Credit First Nation shall be required to scope the Stage 2 and any subsequent stages.

Fact Sheet

Oil and Gas Wells in Ontario

The Ministry of Natural Resources and Forestry (MNRF) is responsible for a variety of activities related to oil and gas wells, including policy development and analysis, licensing and approvals, enforcement, and inspection. The ministry also provides technical support to municipalities related to oil and gas well emergency planning, preparedness, and response.

Responsibility for wells falls to the licence holder, lessee, or other "operator" of that well. Where no licence holder, lessee or other operator exists, the responsibility for the well falls to the landowner.

Municipalities and first responders should be aware of petroleum resources and infrastructure in their communities and include them in their emergency management plans.

Oil and gas wells are human-dug holes in the ground that are typically designed to bring oil or natural gas to the surface.

Wells that are abandoned do not necessarily pose a safety risk. Risks associated with aging infrastructure include:

- leaking wells – show signs of soil staining and vegetation die-off.
- hydrogen sulphide – a poisonous gas that in some instances may be detected by the smell of rotten eggs.
- high pressure / flammability – natural gas and oil may be released at high pressures around wells; these fluids are flammable and combustible.

Members of the public can find information about oil and gas wells in Ontario, including location and status of wells by accessing:

- the interactive petroleum well map at the Ontario Geo Hub: https://geohub.lio.gov.on.ca/search?q=petroleum
- searchable petroleum well records at the Oil, Gas and Salt Resources Library: www.ogsrlibrary.com

Landowners that are aware of, or discover a well on their property, are encouraged to contact the ministry's Petroleum Operations Section at posrecords@ontario.ca or by phone at (519) 873-4634.

If issues are identified with a well, the province will provide advice to the landowner or responsible party to help address the issues. If there is an immediate concern for public health and safety, individuals should evacuate the area and contact 911 or their local emergency services.

Abandoned Works Program

Is a program through the Ministry of Natural Resources and Forestry (MNRF) that can provide financial assistance to well owners to support the plugging of oil and gas wells that are considered to be a risk to public health and safety or the natural environment and which qualify for financial support under the program. This program typically addresses degraded, old wells that may be at risk of leaking.

For more information on this program, please visit: www.ontario.ca/page/abandoned-works-program

Ministry of Natural Resources and Forestry

Addressing Risks from Legacy Oil & Gas Wells & Gas Migration

March 31, 2023

Ontario

Agenda

- Welcome and Introduction
- Minister's Opening Remarks
- Overview of Oil and Gas Hazard Management in Ontario and the Provincial Strategy to Address Hazards Associated with Legacy Oil and Gas Wells and Gas Migration
- Engagement Session

Ministry of Natural Resources and Forestry

Overview of Oil and Gas Hazard Management in Ontario

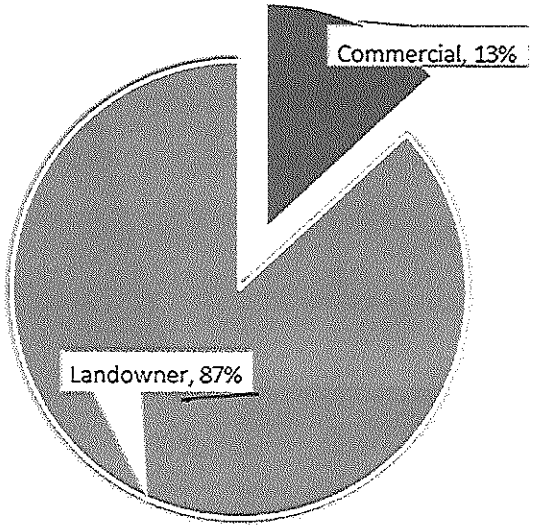
Ontario

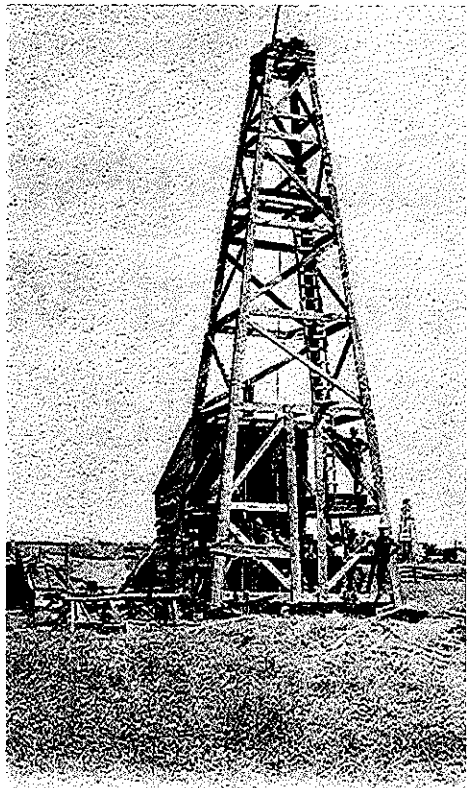
Oil and Gas Wells in Ontario

- Oil and gas drilling activity began in Ontario over 160 years ago
- Many wells have aging infrastructure and were drilled and decommissioned decades ago when some plugging practices were rudimentary or before stringent regulations were in place.
- Vast majority of the oil and gas wells are the responsibility of the landowner.

87%.

Ownership of Oil & Gas Wells

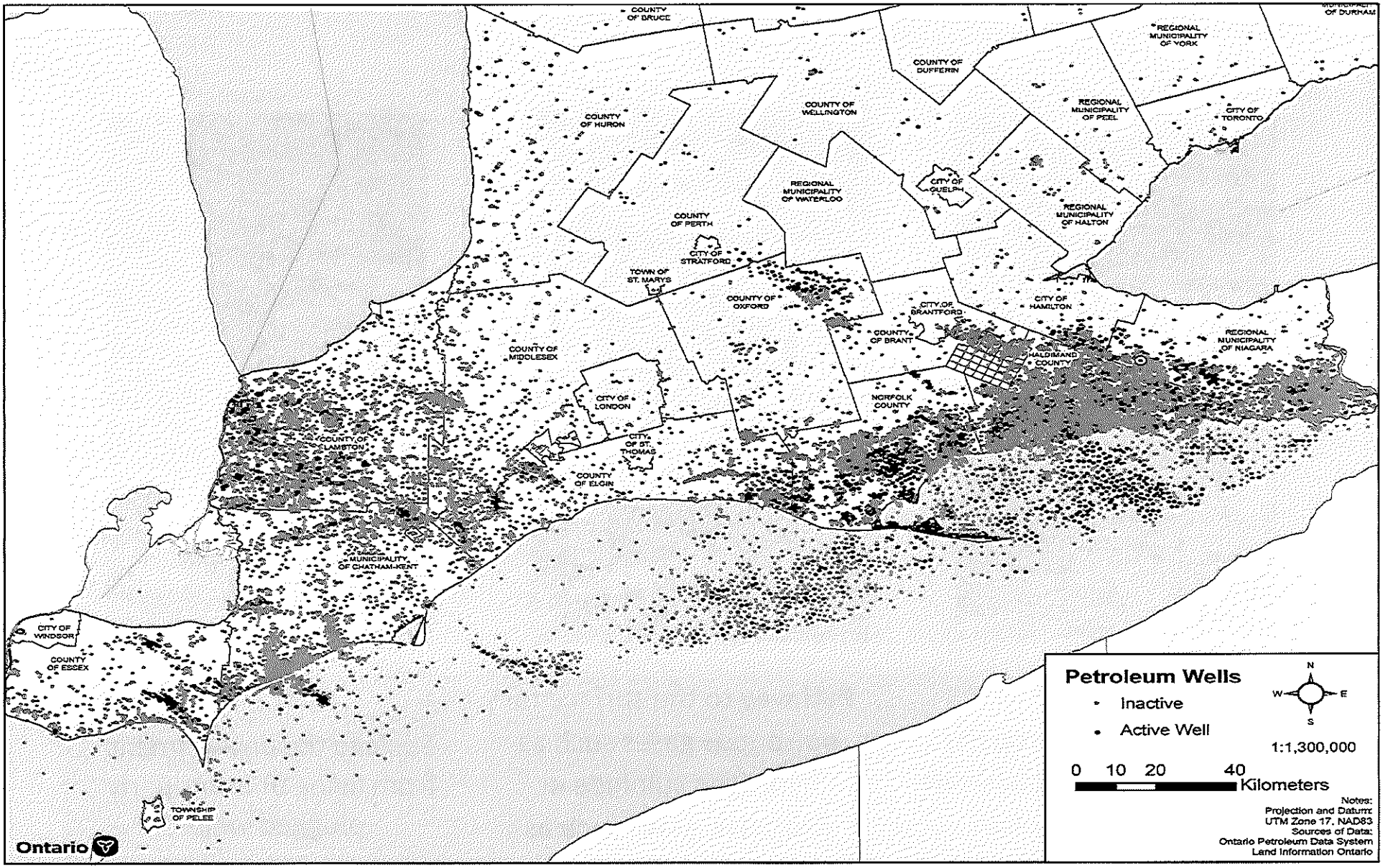




Drilling for oil at Petrolia, Ontario.

Ontario

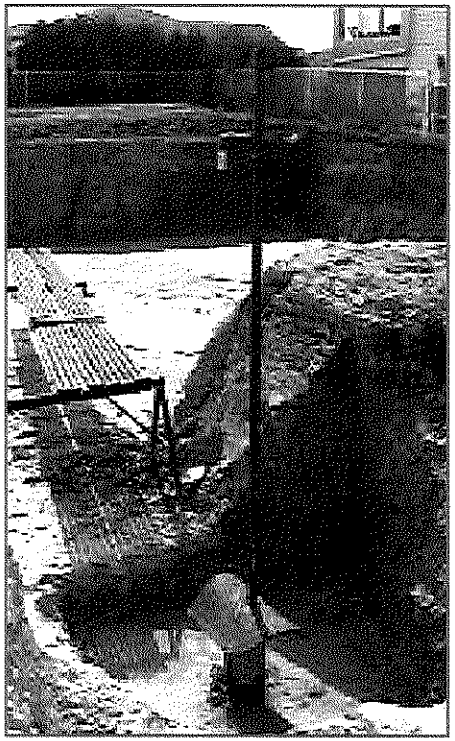
Southwestern Ontario Petroleum Wells



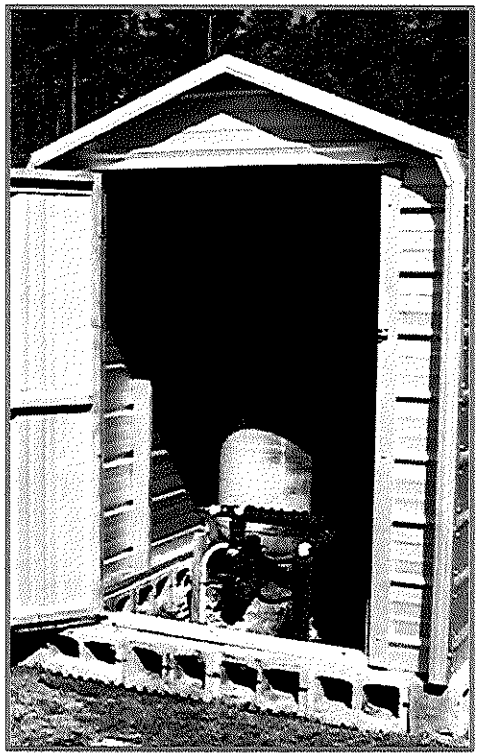
records exist for 27,000 in ont.

Ontario

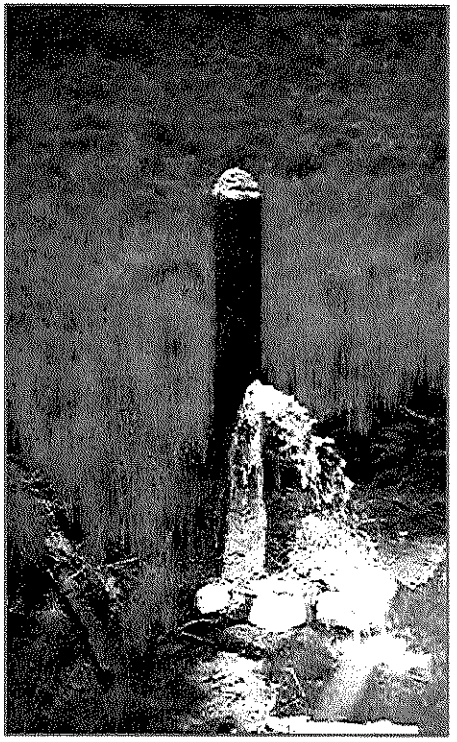
Hazards Associated with Legacy Wells & Gas Migration



Unknown or improperly plugged wells encountered during construction

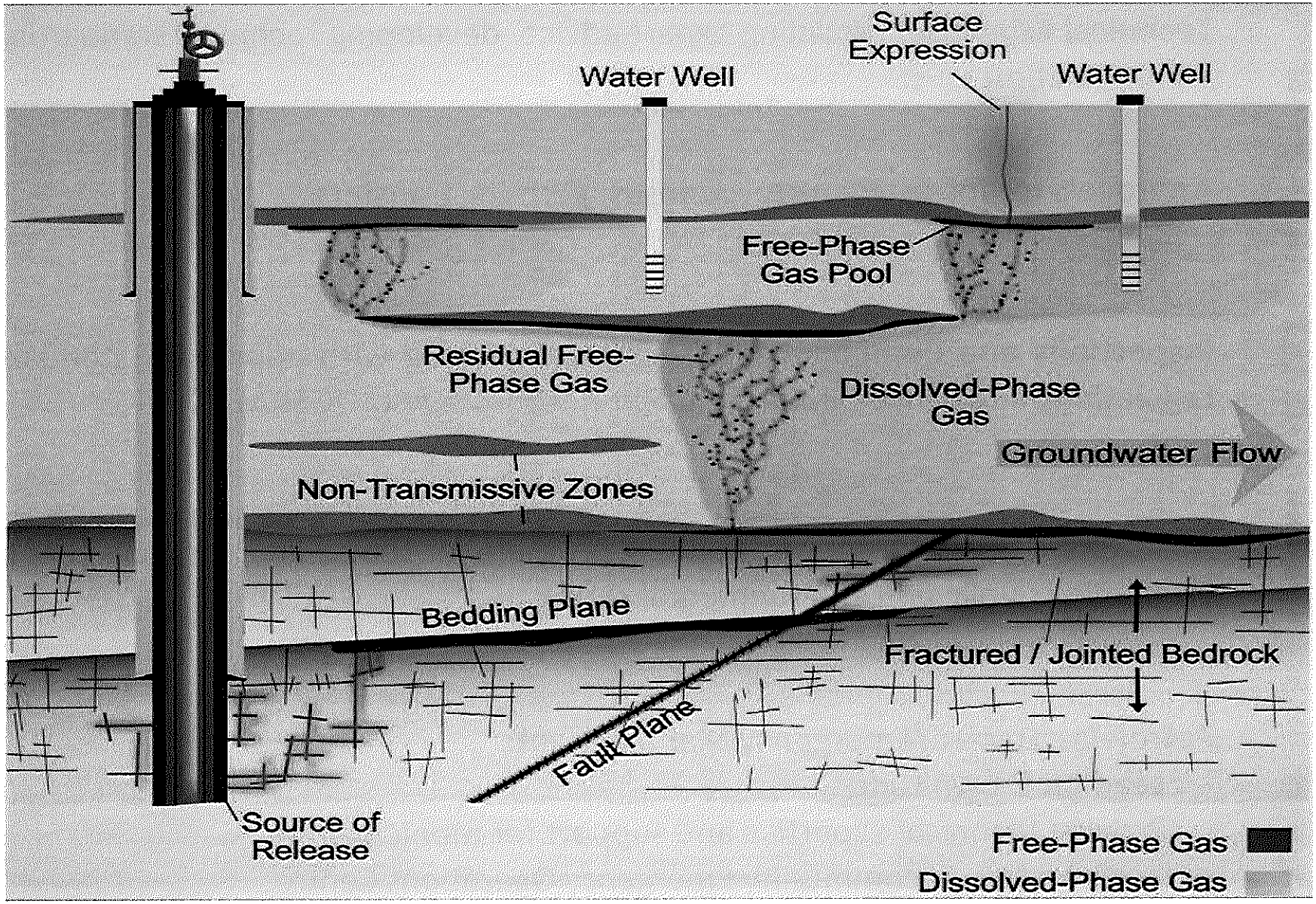


Pathway to the surface for poisonous gases such as hydrogen sulphide or explosive gases such as methane



Spills to the environment from aging or improperly plugged wells

Pathways for Subsurface Gas Migration

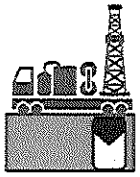


Provincial Management of Petroleum Industry

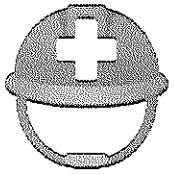
Technical Expertise: providing expert advice, developing technical standards, policy and regulation

Approvals for Infrastructure: Licenses, permits, transfers

Inspections and Compliance: Ensuring compliance with approvals, standards and regulations under the Oil, Gas and Salt Resources Act (OGSRA)



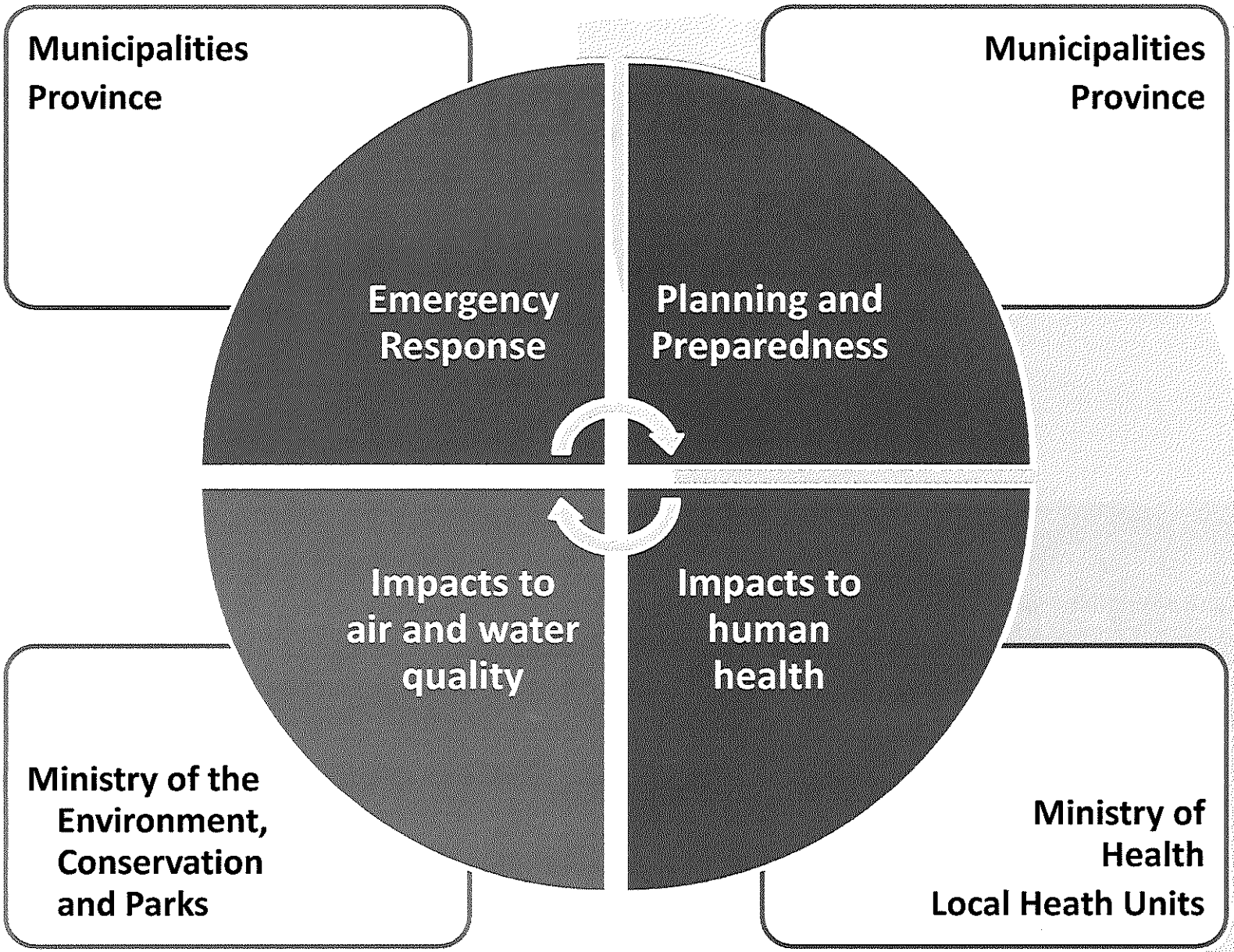
Abandoned Works Program: Funding program for the oil and gas wells that pose a threat to public and environmental safety



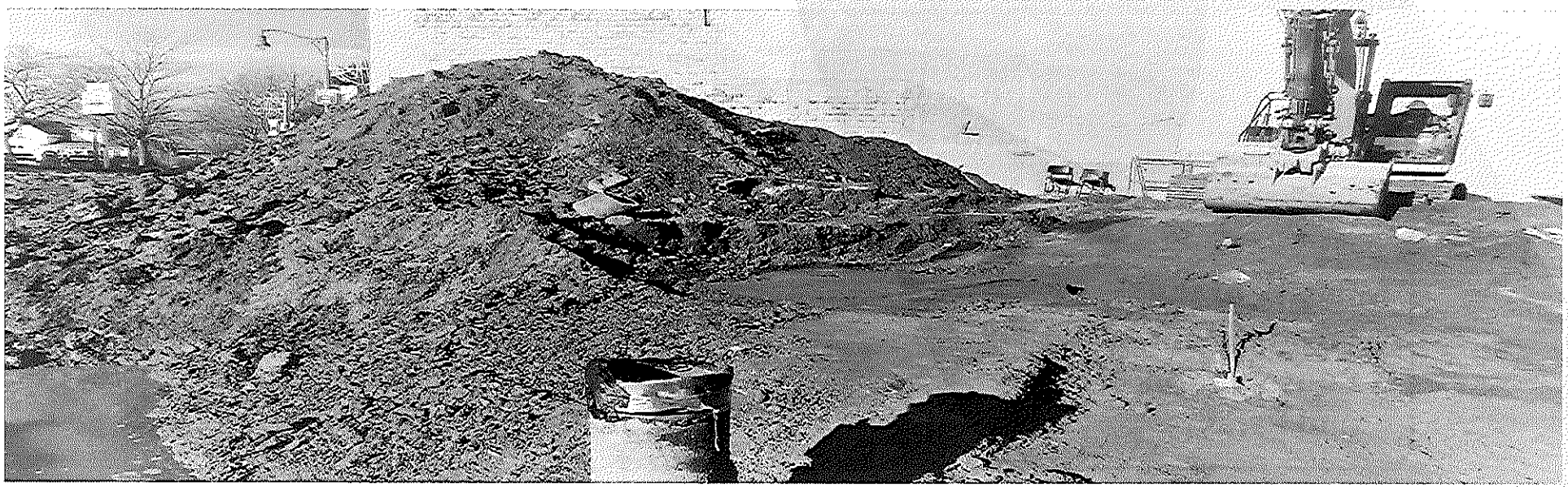
Petroleum Hazard/Emergency Management:

- Lead on Crown Land
- Provide technical expertise and support for municipalities
- Participation in community Emergency Operations Centre
- MNRF assigned the Order in Council for oil and gas emergency plans

Managing Petroleum Emergencies



Overview:
Provincial Strategy to Address Hazards Associated with Legacy Oil and Gas wells and Gas Migration



Path Forward: Legacy Oil and Gas Wells Strategy

Understand Risks

- Expand knowledge to focus on areas of highest risk
- Evaluate strategies to mitigate risk
- Invest in science to inform solutions

Reduce Risks

- Address risks in collaboration with ministry partners
- Develop products and tools for municipalities and the public

Enhance Preparedness

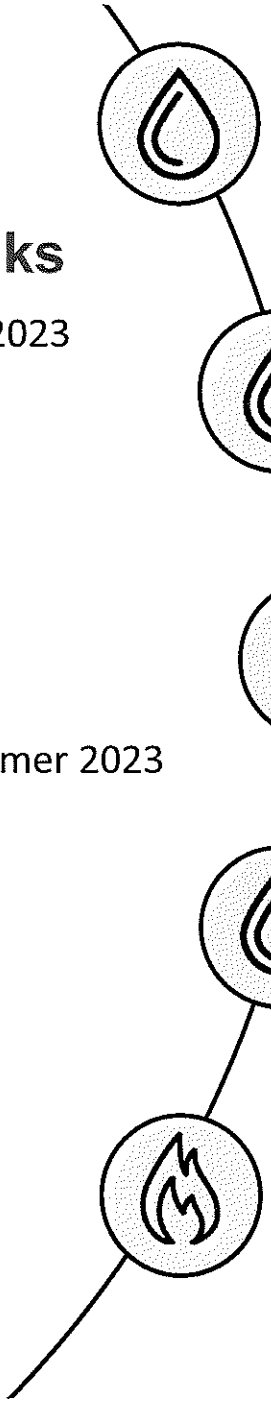
- Improve emergency preparedness by enabling municipalities and partners to develop plans for prevention and response

Engagement, Consultation and Partnerships

Reviewing the feedback from consultation discussions will play a key part in:

- Identifying opportunities for province to assist municipalities and landowners manage legacy oil and gas wells and subsurface gas migration hazards
- Defining areas of highest risk to public and environmental safety
- Enhancing working relationships across ministry and municipal partners
- Improving emergency preparedness and response
- Promoting awareness of risks and access to tools and supports

Path Forward: Work Underway and Planned



Understand Risks

Spring 2023

Research and Studies

Legacy Well Risk Assessment to expand knowledge of areas of highest risk to inform future mitigation strategies.
Jurisdictional Review to learn from the policies and strategies implemented by others with similar challenges

Stakeholder and Partner Engagement

Ensuring the action plan considers a broad range of input from partners and stakeholder during the early stages of development, through to implementation.

Summer 2023

Collaboration

Leveraging contacts within municipalities, industry and academia for technical expertise

Establish cross-agency Technical Advisory Working Groups

Enhanced Communication

New Toolkits for landowners and municipalities on how to access information on legacy wells and available funding.

Reduce Risks

Spring 2023

Program Improvement

On-going plugging of legacy wells while reviewing the Abandoned Works Program to make improvements for long term sustainability.

Path Forward: Work Underway and Planned

Enhance Preparedness
2023/2024

Enhanced Supports
Exploring options for programs to support municipalities, with a focus on emergency planning and preparedness

Analysis of Policy Needs
Cross-ministry reviews of program options to mitigate risks and enhance emergency preparedness

Improved Communication
Clear multi-agency roles and responsibilities

Continued development of outreach tools and supports

Reduce Risks
2025/2026

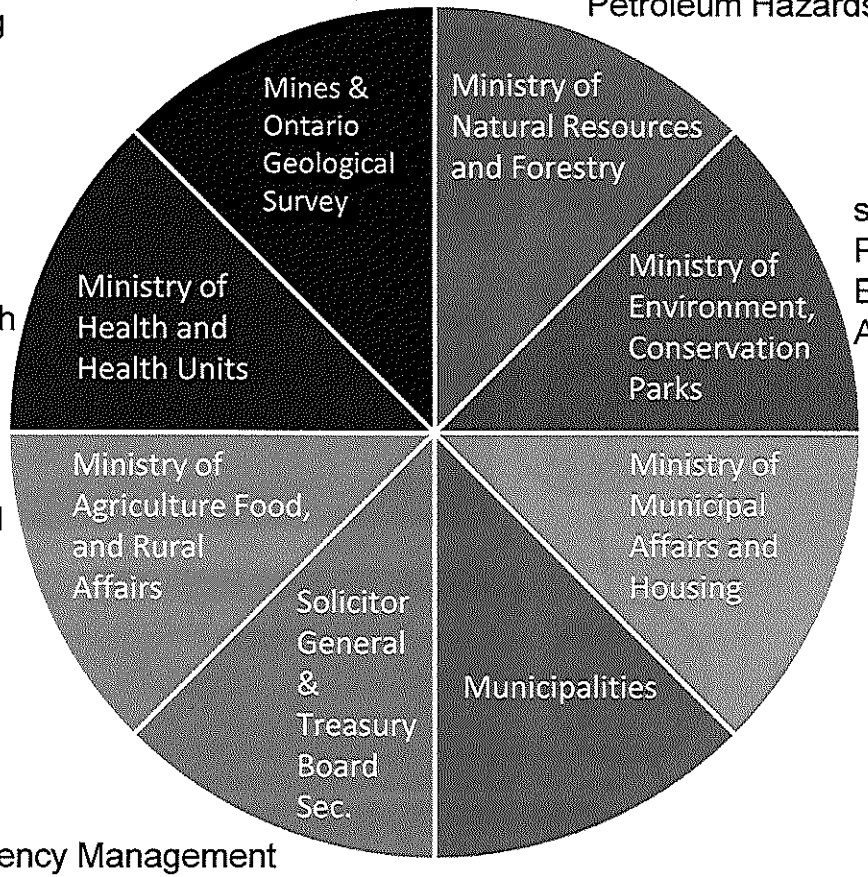
Program Improvements
Implement outcomes of program reviews and potential policy needs, including statue or regulatory changes

Enhanced Support Programs
Opportunities for additional public awareness, self reporting, monitoring

New programs, tools and supports for municipalities

Coordinated emergency preparedness resources

Shared Responsibilities



Subsurface research
Ambient groundwater monitoring
Mapping

Inspections, compliance and approvals of petroleum resource activities
Abandoned Works Program
Petroleum Hazards/Emergency Management

Human-health risks
Evacuation orders
Public Communications/Outreach

surface and groundwater legislation
Protection of drinking water quality
Environmental Response/Spills Action Centre
Air emissions

Rural communities and Infrastructure
Communications with agricultural community

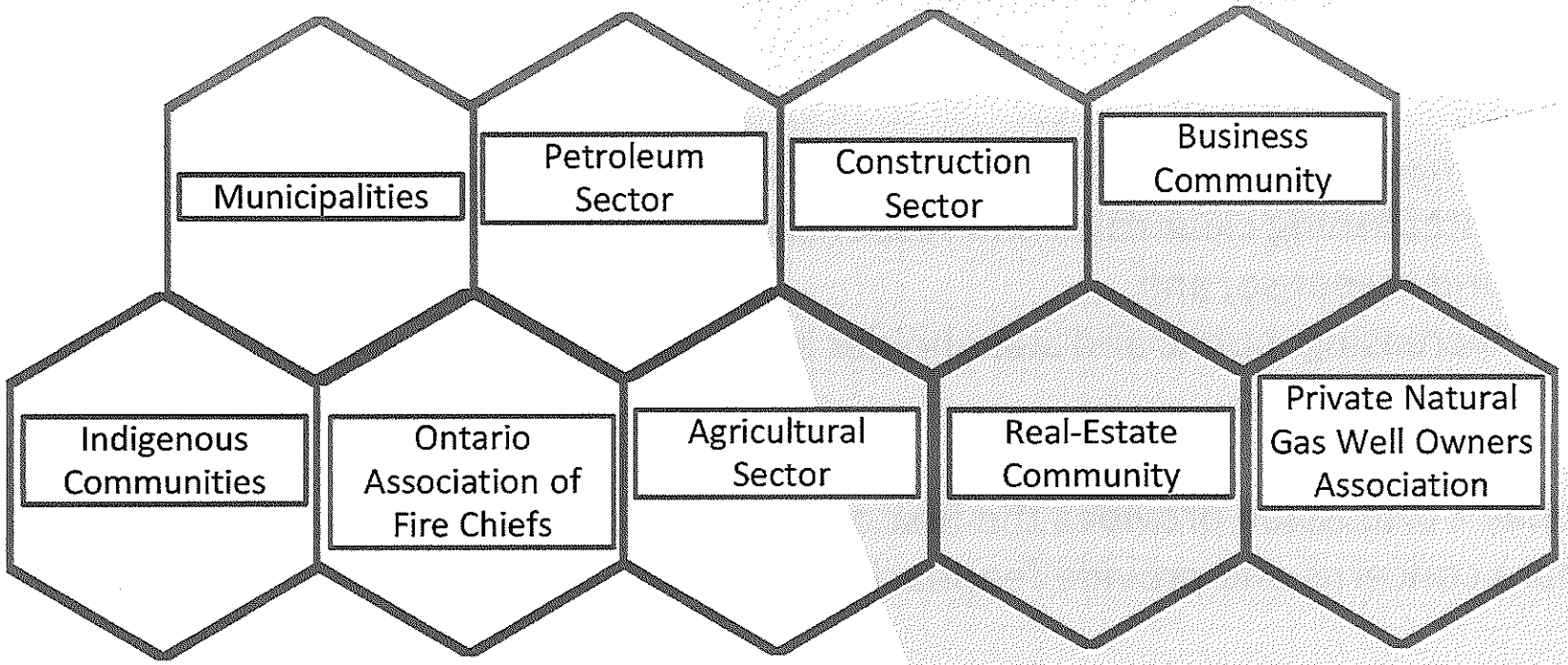
Emergency response
Land use planning
Provincial policy statement
Building code

Emergency Management Ontario
Emergency management framework
Provincial emergency response
Ontario Fire Marshall

Communications with landowners
Emergency response and planning
Official plans and zoning by-laws
Land use planning and approvals

Other Key Partners
- Ministry of Indigenous Affairs
- Indigenous Communities
- Indigenous Services Canada (ISC)
- Indian Oil and Gas Canada (IOGC)
- Conservation Authorities
- Oil, Gas & Salt Resources Library
- Private Gas Well Owners

Targeted Groups for Early Engagement (2023)



Conclusion

- We are seeking to better understand the specific needs of municipalities and determine how best to provide additional supports as part of the action plan.

- Your input will inform the development and implementation of our comprehensive, action plan with outcomes that include:
  - Defining areas of highest risk to public and environmental safety;
  - Enhancing relationships with provincial and municipal partners;
  - Establishing clear roles and responsibilities for emergency preparedness and response; and
  - Increasing public and stakeholder awareness of risks and access to tools and supports.

- Today's discussion provides the first of many opportunities for our municipal partners to share concerns and provide feedback.

Notes

Ontario

Notes

Ontario

Notes

Terms of Reference
Bridgeburg North Land Use Compatibility Study

February 2024

Statistical Calculations

All Land Use Concept maps, shall provide for a statistical breakdown of use and population, the below is an example of a Land Use Concept and Population Statistics Breakdown:

	Area (ha)	% of GA
Gross Area (GA)	#	100%
- Natural Heritage	#	%
- Arterial Road Right-of-way	#	%
- Other Right-of-way	#	%
Gross Developable Area	#	
- Existing Land Uses	#	
- Commercial		
❖ Major Commercial	#	
❖ Neighborhood Commercial	#	
- Parkland, Recreation, Open Space		
❖ District Park	#	
❖ Neighborhood Park	#	
- Institutional		
❖ Fire Station	#	
❖ School	#	
❖ Civic Area (Libraries, Rec Centres, etc…)	#	
- Mixed Use		
- Transportation		
- Dedicated Active Transportation		
- Transit Centre		
- Infrastructure/Servicing		
❖ Stormwater Management Facilities		
❖ Pump Stations, Etc…		
Special Uses.		
Total Non-Residential Area		
Net Residential Area (NRA)		

Residential Land Use Area, Unit & Population Count						
Land Use	Area (ha)	Units/ha	Units	People/Unit	Population	% of NRA
Single/Semi-Detached						
Townhomes						
Low-rise/medium density housing						

Medium to High Rise Units						
Total Residential						100.00%

Sustainability Measures	
- Population per net hectare (ppnha)	#
- Units per net residential hectare (upnrha)	#
[Single/Semi-Detached / [Row Housing: Low-rise/Medium Density Housing; Medium to High-Rise Units] Unit Ratio	%/%
Population (%) within 500m Parkland	
Population (%) within 400m of transit	
Population (%) within 600m of Commercial Services	

Presence/Loss of Natural Heritage Features	Land	Water
Protected as Environmental Protection (ha)		
Conserved under conservation overlay (ha)		
Protected through other means (please specify) (ha)		
Lost to Development (ha)		

STUDENT GENERATION COUNT

Public School Board
Elementary School
Middle School
High School

Separate School Board
Elementary School
Middle School
High School

Francophone School Board
Elementary School
Middle School
High School

Total Student Population

Terms of Reference

Bridgeburg North Traffic Impact Study

February 2024

Transportation Impact Study
It can be expected there will be a need to coordinate and communicate with outside or third-party consultants retained by the Town as part of the proposed work plan. The Consultant will work with Town staff to ensure a coordinated output that aligns with work being performed. Wherever feasible, the sharing of data will provide for the most accurate and up-to-date traffic conditions and projections to assist in delivering more reliable results for long-range planning and capital projection estimates and potential capacity constraints.

The Plan Area presently involves three roadway jurisdictions (Town, Region, Niagara Parks Commission, and Ministry of Transportation) that will share an interest in the transportation planning for this area.

The Niagara River Parkway is controlled access highway, that provides a scenic drive running parallel to the Niagara River 55 km from Fort Erie in the south, to Niagara on the Lake in the north. New road connections to the Niagara River Parkway will be discouraged.

The Plan Area can be characterized as being Greenfield, with significant natural heritage features with limited existing origin and destination traffic being generated.

The Plan Area was added as "Community Lands" through an urban boundary expansion exercises and can be expected to develop with residential prominence. To a lesser extent, traffic generation from population related employment (commercial and institutional use) may also result for portions of the Plan Area.

The Proponent will have a working knowledge and understanding of the policy framework that relates to transportation planning occurring at the provincial, regional, and local levels. The following documents contain relevant policy direction in relation to transportation planning matters that may impact the Secondary Plans subject to this RFP:

Provincial Policy Statement: *(or potentially Provincial Planning Statement subject of Bill 97)*
https://www.ontario.ca/page/provincial-policy-statement-2020

A Place to Grow - Growth Plan for the Greater Golden Horseshoe (Growth Plan):
https://www.ontario.ca/document/place-grow-growth-plan-greater-golden-horseshoe

Ministry of Transportation's Greater Golden Horseshoe Transportation Plan (GGH Transportation Plan):
https://www.ontario.ca/page/connecting-ggh-transportation-plan-greater-golden-horseshoe#:~:text=What's%20in%20the%20plan%3F,the%20region%20into%20the%20future.

Niagara Region Official Plan:
https://www.niagararegion.ca/official-plan/

Niagara Region Transportation Master Plan – How We Go:
https://www.niagararegion.ca/2041/transportation-master-plan/default.aspx

Niagara Region Transportation Impact Guidelines July 2023:
https://www.niagararegion.ca/business/pdf/traffic-impact-study-guidelines.pdf

Official Plan for the Town of Fort Erie, consolidated September 1, 2021;
https://www.forterie.ca/en/build-and-invest/official-plan.aspx

The Transportation Impact Study will comprise three phases of study and reporting.

Phase 1 – Existing Conditions and Baseline Model
The first phase of the study work will make use of available Town, Region or third-party traffic and collision data for the immediate area. A description and an illustration of the existing transportation system within the study area shall be provided in the existing conditions section of the TIS and shall include, but not be limited to, the following:

- Roads indicating the number of lanes, jurisdiction and posted speed;
- Existing intersection control
- Signalized/unsignalized intersections and interchange ramp terminals indicating, as relevant:
- Lane configurations, widths and storage lengths; Available permitted movements;
- Location of sidewalks, bicycle paths/routes and pedestrian control and school crossing guard locations;
- Planned roadway and pedestrian improvements which will have a noticeable impact on the transportation operations within the study area; and
- Have regard for other developments in the study area, which are under construction, approved or for which an application has been submitted. Briefly describe the size and nature of these developments in general terms.

The Consultant will utilize the recently developed Niagara Region Activity Based Model (NRABM). The NRABM was calibrated to 2023 or newer traffic counts with adjustments to reflect current conditions and provides travel demand forecasts and network auto, truck and transit person assignments for the planning horizons of 2031, 2041 and 2051. For the purpose of this RFP, the Proponent should anticipate build-out of the respective Plan Areas will be achieved at, or within, the 2051 planning horizon.

The initial phase will also review the perimeter road networks to assess optimal future intersection recommendations for consideration during the conceptual land use planning phase of the secondary planning exercises.

In addition to generating the baseline for vehicular volumes and pattern modeling, the Consultant will be required to identify the existing transit systems/networks and any active transportation networks in the vicinity that present opportunities to broaden all modes of transportation options for future residents.

It is also anticipated that transportation team representatives will be required to meet directly with Ministry of Transportation representatives to address and resolve Ministry concerns wherever identified. Such meetings will be coordinated through the Consultant's PM with appropriate Town and Region staff in attendance as well.

<u>Phase 1 – Existing Conditions Report</u>
On conclusion of the background review and baseline modeling, the Consultant will provide a report identifying the extent of existing conditions (roads, transit, active transportation and trails) for review by Staff and relevant jurisdictions.

The Report will be used to inform land use options development and should highlight situations or challenges that may positively or negatively influence initial land use concepts.

The Report will also supply mapping that illustrates locations of nearest transit routes, active transportation infrastructure and sidewalk networks for consideration on how connections may best be made or introduced for each of the Plan Areas. The Phase 1 report will be a public facing document once finalized and made available on the Town's project webpages for public access.

Phase 2 – Cursory Concept Assessment

Following the Town's development of Land Use Options (up to 3 are planned), the Consultant will provide a cursory review of each land use arrangement with respect to:

- primary road network functional flow;
- intersection location; and
- suitability for transit provision, pedestrian movement and active transportation facilities.
- Trip Generation
- New road corridors

The Consultant will provide illustration suitable for public consultation and presentation and will have appropriate representation at the planned public open house.

Town staff and the Consultant will consider public comments and commentary from the Assessment Report when selecting the most appropriate land use option or hybrid concept to advance as the preferred land use plan.

The Phase 2 – Concept Assessment Report will be a public-facing document made available on the project web pages once complete and accepted by the Town.

Phase 3 - Transportation Impact Study

The Consultant will use the preferred land use concept for the detailed impact assessment that provides for:

- future travel demands by mode; Development beyond study area, Transportation demand measures
- New road corridors
- assessing adequacy of Plan Area access and internal collector road locations to determine the classification and features of a new roadway that has direct impacts on the development of land use concepts; (permeability, separations, sight lines, level of service and Traffic Calming Measures, Specifically, outline and recommend appropriate traffic calming measures based on the findings of the assessment.);
- travel patterns and resulting infrastructure requirements; and to identify the potential capacity constraints;
- timing and opportunities for road improvements
- Timing for implementation and cost estimates

In addition to the traffic modeling, there will be need for the Consultant to make policy recommendations for inclusion in the Secondary Plans documents, including recommendations on transit planning consideration and provision, active transportation facility provision pedestrian network connections and bicycle route planning to encourage the use of a variety of modes of transportation within the Plan Areas and connection beyond.

The Transportation Impact Study will be circulated to Town staff for review and comment at 75% completion and prior to finalization. All phase-ending reports will be a public-facing documents to be made available on the Town's project web pages and required to be fully AODA compliant.

The Consultant's PM will ensure a responsible representative is available for public open house engagement who may be asked to present and receive questions in open forums.

Deliverables

Phase 1:

- Draft of the Existing Conditions and Baseline Model Report and associated mapping
- Final Existing Conditions and Baseline Model Report and associated mapping
- Presentation slides

Phase 2:

- Draft of the Cursory Options Assessment Report and mapping
- Final Cursory Options Assessment Report and mapping outlining pros and cons respecting each assessed option,
- Presentation slides
- Evaluation of options

Phase 3

- Draft of the Preferred Land Use Plan – Transportation Impact Study and mapping
- Final Preferred Land Use Plan – Functional Servicing Study and mapping
- Presentation slides
- Any database created or modified, digital mapping or digital modeling
- Meeting chronology, agenda and minutes
- 75% draft of TIS
- Draft TIS
- Final TIS

Intersections identified in the table below should have an impact by the increase of traffic volumes on adjacent facilities; Volume/capacity (V/C) ratios for overall intersection operations, through movements, or shared through/turning movements increased; or V/C ratios for exclusive movements increased.

The list of key intersections in the study area is not final, other intersections or roads may be added after we see how development traffic is forecast to use the road network.

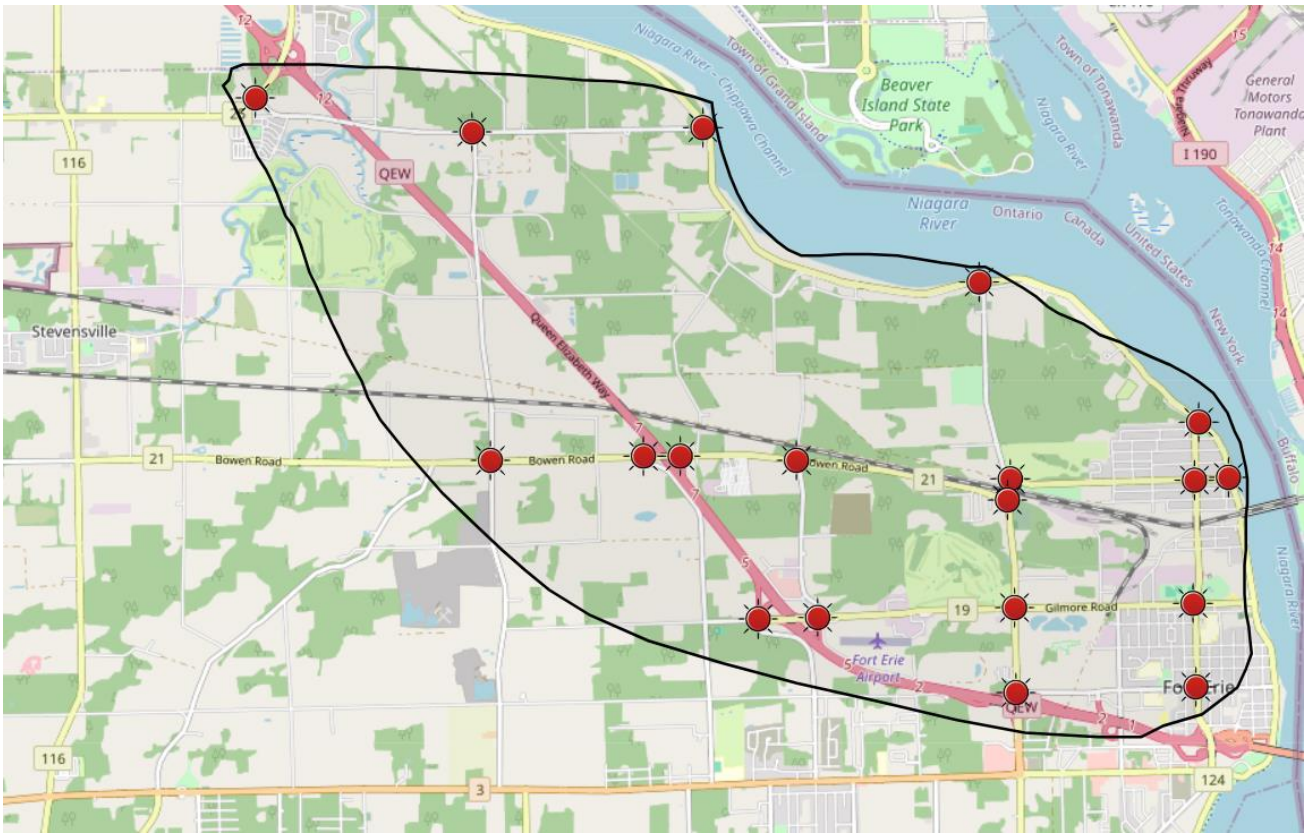


Figure 1 Study area key intersections

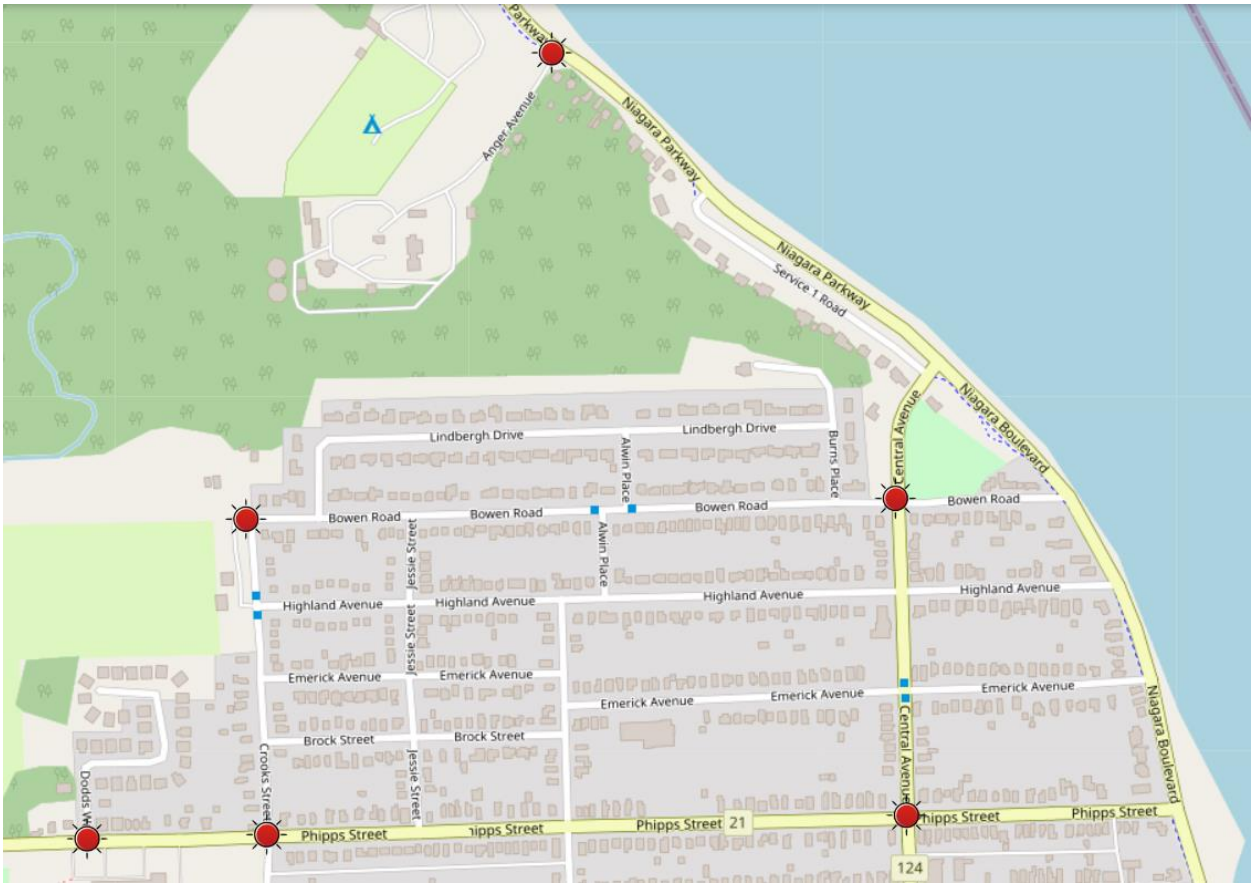


Figure 2 Study area key intersections

Table 1: Study Area to Include Intersections for Transportation Impact Study

No	Street	At
1	Townline Road	Netherby Road
2	Townline Road	Ridgemount Road
3	Townline Road	Niagara Parkway
4	Bowen Road	Ridgemount Road
5	Bowen Road	Sunset Drive
6	Bowen Road	Pettit Road
7	Bowen Road	Thompson Road
8	Phipps Road	Thompson Road

No	Street	At
9	Phipps Road	Central Avenue
10	Phipps Road	Niagara Parkway
11	QEW off-ramp	Bowen Road
12	Pettit Rd	Gilmore Road
13	QEW off-ramp	Gilmore Road
14	Gilmore Road	Thompson Road
15	Gilmore Road	Central Ave
16	Thompson Road	Gilmore Road
17	Bertie St	Thompson Road
18	Bertie St	Central Avenue
19	Anger Avenue	Niagara parkway
20	Dodds Court	Phipps Street
21	Crooks St	Bowen Rd
22	Crooks St	Phipps St