

YR Project # 78270

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**Ballantrae Long-Term Water  
Supply  
Schedule B Class EA  
PROJECT FILE**

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FINAL REPORT • JANUARY 2019

REPORT PREPARED FOR



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York**  
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TMIG PROJECT NUMBER 16107



## EXECUTIVE SUMMARY

This project file describes the planning process followed and conclusions reached for the Ballantrae Long Term Water Supply Class Environmental Assessment, which follows the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment process.

Amendment 136 to the Town of Whitchurch-Stouffville's Official Plan proposes to increase the population of Ballantrae-Musselman's Lake to 6,230 persons. To support the additional growth proposed, the Region would ultimately need to be able to allocate a water supply capacity for 6,230 residents within the Town. This may require an increase in the water supply and storage volumes, and the Permit to Take Water maximum daily water taking. For this project, a Schedule B Class EA is required.

The Notice of Study Commencement was prepared to describe the Environmental Assessment process, the objective of the project and the Problem Statement. It was issued on June 23, 2016.

As part of EA process, a comprehensive list of potential alternative solutions has been identified. A preliminary assessment of the environmental impacts has been undertaken, and of the nine alternatives identified, only seven were carried forward into subsequent phases of the Class EA process. A series of environmental screening documents were prepared for the Region by Golder Associates as part of the overall Class Environmental Assessment (Class EA) process. These included the Hydrogeological Impact Assessment, Archaeological Screening, Cultural Heritage Screening, Natural Environment Screening, and Geotechnical Desktop Study Report.

The first Public Consultation Centre for this Class EA took place on November 21<sup>st</sup>, 2016. The purpose of this discretionary PCC was to describe the problem and the Alternative Solutions, and to present the potential environmental impacts to the public to get their input and to ensure that they were satisfied that no significant environmental impacts were omitted from the Study.

The alternative solutions were evaluated based on the Technical Feasibility, the ability to satisfy the growth projections in the Town of Whitchurch-Stouffville OPA-136, the ability to satisfy Regional Design Standards, the ability to comply with Legislative Requirements, the Operational Flexibility, the potential impacts on the Natural Environment, the potential impacts on the Social-Cultural Environment and the life-cycle cost of each solution.

The recommended preferred solution was determined to be Expand the Existing Well Sites. Through the review of the alternatives and the technical requirements to service the full buildout, the following upgrades are required:

1. Increase the combined firm pumping and treatment capacity of the three wells from 5,236 m<sup>3</sup>/day to 5,420 m<sup>3</sup>/day (a total increase 184 m<sup>3</sup>/day); and,
2. Increase the existing Permit to Take Water limit from 4,580 m<sup>3</sup>/day to 5,420 m<sup>3</sup>/day (a permit increase of 840 m<sup>3</sup>/day).

Overall, the changes required were determined to be minor in nature, consisting of modifications to the pump operation set-points and possibly some minor upgrades to some of the additional mechanical equipment at the facilities.

The second Public Consultation Centre took place on April 24<sup>th</sup>, 2017, with the express purpose of advising the interested parties of how the evaluation of the Alternative Solutions was conducted, as well as the outcome of the evaluation. During this PCC, the "Recommended Preferred Solution" was presented and the Public were invited to comment before confirming it as the final Preferred Solution.

First Nations and Métis organizations that potentially have an interest in this project were identified to provide them with an opportunity to provide their input and to address their comments/concerns.

The Notice of Study Completion, dated January 17, 2019, was prepared to notify the public of the completion of this study, and to advise of opportunities to review this report. At the conclusion of the 30-day public review period, the recommendations of the Class EA will be finalised, provided no Part 2 Order Request is submitted.

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# 1 INTRODUCTION

This project file describes the planning process followed and conclusions reached for the Ballantrae Long Term Water Supply Class Environmental Assessment (Class EA), which followed the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (Class EA) process.

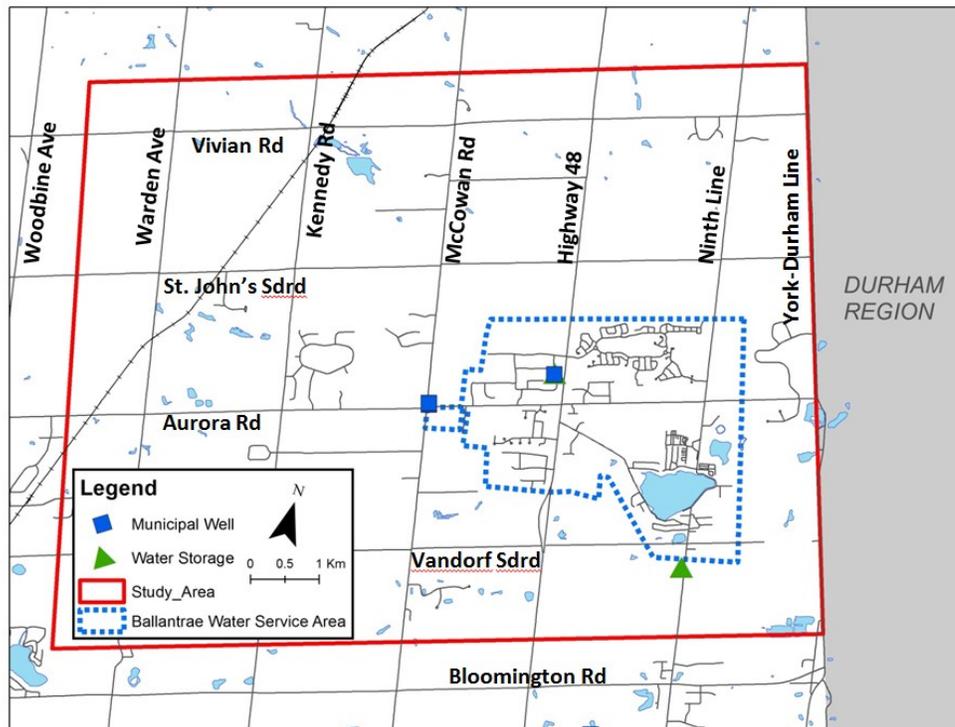
The Town of Whitchurch-Stouffville proposes to increase the population of Ballantrae-Musselman’s Lake, in accordance with the *Ballantrae-Musselman’s Lake and Environs Secondary Plan*. Servicing the proposed growth may require an increase in the permitted water supply and storage volumes, and the Permit to Take Water maximum daily water taking.

This project file documents the planning process that was followed, the Study Area, a summary of the background information, the problem/opportunity statement, the evaluation of the alternative water and wastewater solutions, and the determination of the preferred solution. The public consultation undertaken through this process is also summarised in the report, and fully documented in the appendices.

## 1.1 Study Area

The Water Service Area for this project is the inner polygon shown in *Figure 1-1*. The overall Study Area is located in the Regional Municipality of York, and is approximately bordered on the north side by Vivian Road, on the east side by York-Durham Line, on the south side by Bloomington Road and on the west side by Warden Avenue, in the Town of Whitchurch-Stouffville.

Figure 1-1 Project Study Area



While this Class EA considers future population being added to the Service Area, the effects of any changes (adverse environmental impacts, for example) will be reviewed across the entire Study Area.

## 1.2 Class Environmental Assessment Process

The planning of major municipal projects or activities is subject to the Ontario Environmental Assessment (EA) Act, R.S.O. 1990, and requires the proponent to complete an Environmental Assessment, including an inventory and description of the existing environment in the area affected by the proposed activity.

The Class EA process is maintained and updated by the Municipal Engineers Association, in consultation with the Ministry of the Environment, Conservation and Parks (MECP)<sup>1</sup>, as an alternative method to Individual Environmental Assessments for recurring municipal projects that were similar in nature, usually limited in scale and with predictable range of environmental effects which were responsive to mitigating measures.

Class EA provides for the following project designations depending upon potential impacts:

- Schedule A - Projects are limited in scale, have minimal adverse environmental effects and include a number of municipal maintenance and operational activities. These projects are pre-approved. Schedule A projects generally include normal or emergency operational and maintenance activities.
- Schedule A + - Projects are within existing buildings, utility corridors, rights-of-way, and have minimal adverse environmental effects. These projects are pre-approved; however, the public is to be notified prior to project implementation.
- Schedule B - Projects have the potential for some adverse environmental effects. The municipality is required to undertake a screening process (Phases One and Two), involving mandatory contact with directly affected public and relevant review agencies, to ensure they are aware of the project and that their concerns are addressed. Schedule 'B' projects require that a report be prepared and submitted for review by the public and review agencies. If there are no outstanding concerns, then the proponent may proceed to implementation.
- Schedule C - Projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA document. Schedule C projects require that an Environmental Study Report be prepared and filed for review by the public and review agencies.

The Project Team initiated this project as a Schedule 'B' Class Environmental Assessment. The project classification was reconfirmed following the identification of the alternative solutions (see Section 6). As a Schedule 'B' activity, the following Class EA planning phases apply:

- Phase 1 - Identify the problem (deficiency) or opportunity.
- Phase 2 - Identify and evaluate alternative solutions to address the problem or opportunity by taking into consideration the existing environment, and establish the preferred solution taking into account public and review agency input.
- Phase 5 - Complete contract drawings and documents, and proceed to construction and operation; monitor construction for adherence to environmental provisions and commitments. Where special conditions dictate, also monitor the operation of the completed facility.

The Class EA process also provides an appeal process to change the project status. Under the provisions of subsection 16 of the amended EA Act, there is an opportunity under the Class EA planning process for the Minister to review the status of a project. Members of the public, interest groups and review agencies may request the Minister to require a proponent to comply with Part II of the EA Act, before proceeding with a

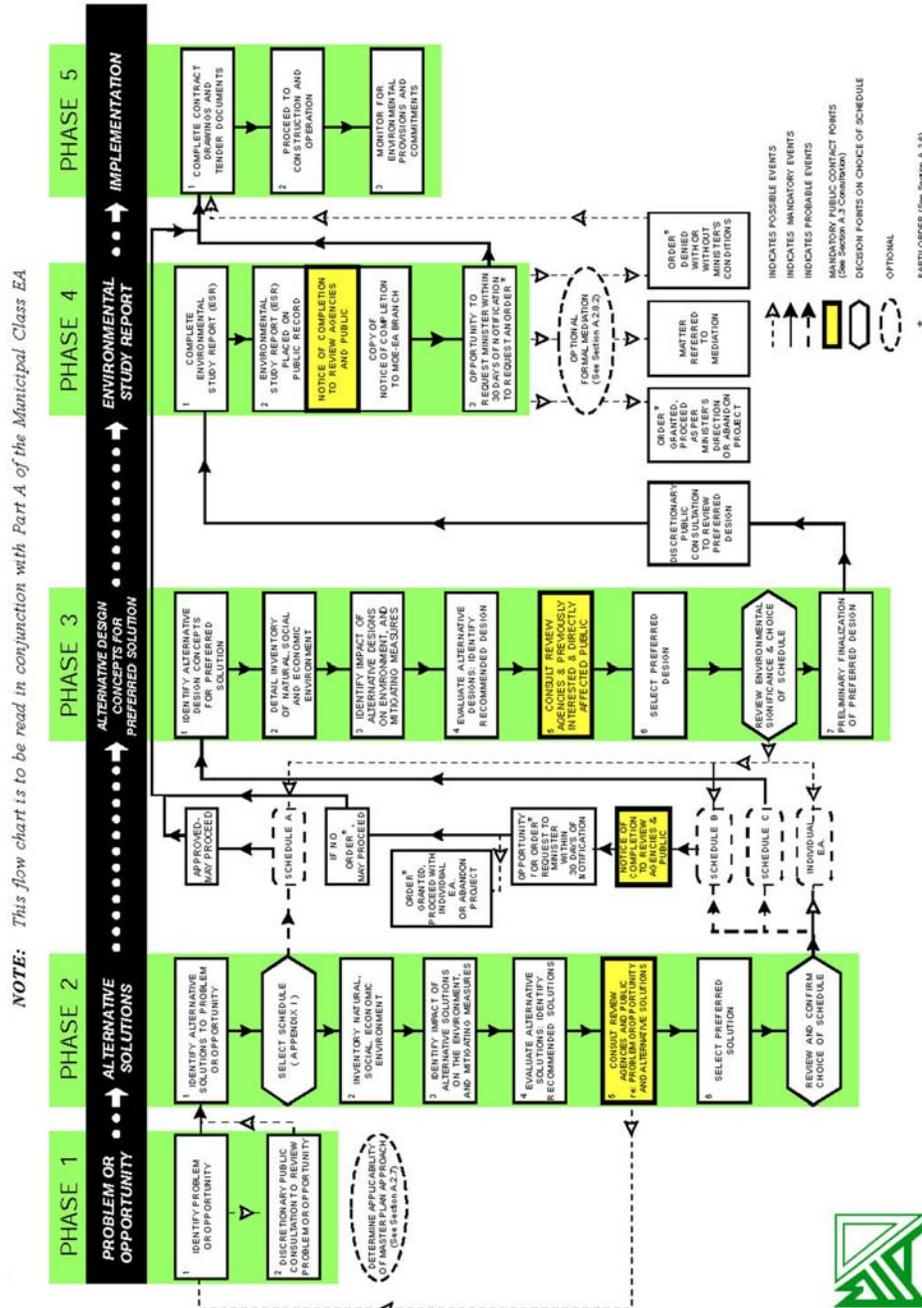
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<sup>1</sup> During this Class EA Process, the name of the Ministry changed from 'Ministry of the Environment and Climate Change' (MOECC) to 'Ministry of the Environment, Conservation and Parks' (MECP).

proposed undertaking. This is known as a “Part II Order” (formerly called “Bump-Up Request”). The Minister determines whether this is necessary with the Minister’s decision being final. The procedure for dealing with concerns which may result in the Minister, by order, requiring the proponent to comply with Part II of the Act is outlined in the Municipal Class Environmental Assessment document.

Following the end of the 30-day public review period, if there are no outstanding Part II Order Requests, the project may proceed to Phase 5 of the Class EA process to complete design and the contract drawings and tender documents, and then move on to construction. A flow chart describing the Class EA planning and design process is shown in **Figure 1-2**.

Figure 1-2 Class EA Planning Flow Chart (MEA, October 2000, as amended in 2007, 2011 & 2015)



### 1.3 Project Team

The Regional Municipality of York has initiated a Schedule 'B' Class Environmental Assessment (Class EA) study for the Ballantrae Long-Term Water Supply. The Region has retained the services of The Municipal Infrastructure Group Ltd. to act on the Region's behalf to complete the work for this project. The key members of the project team are listed in **Table 1-1**.

*Table 1-1 Key Project Team Members*

<b>The Regional Municipality of York</b>	
Jessica Garner, P.Eng.	Senior Project Manager
<b>The Municipal Infrastructure Group Ltd.</b>	
Stephen O'Brien, P.Eng.,	Project Manager
Kevin Brown, P.Eng.	Assistant Project Manager
Golder Associates,	Environmental Studies
SWERHUN,	Public Consultation Facilitation

## 2 BACKGROUND INFORMATION

As part of this study, TMIG has undertaken a review of the background information relating to the community's water supply. The following documents were reviewed to develop the Problem and Opportunity statement for the Class Environmental Assessment.

1. *Official Plan Amendment No. 136* (Town of Whitchurch-Stouffville, January 2014)
2. *Council in Committee Report: 'Municipal Water Allocation – Community of Ballantrae-Musselman's Lake (D04)'* (Town of Whitchurch-Stouffville Development Services, March 1 2016)
3. *Oak Ridges Moraine Conservation Plan* (MMAH, 2002)
4. *Ballantrae-Musselman's Lake Servicing Report* (AMEC, November 2012)
5. *York Region Water and Wastewater Master Plan Update (GENIVAR | XCG, November 2009)*
6. *York Region Water and Wastewater Master Plan Update (July 2016)*
7. *MECP Permit to Take Water*
8. *MECP Drinking Water Works Permit #013-206*

The relevant details of these documents are summarised below.

### 2.1 Official Plan Amendment No 136

The Community of Ballantrae has a current planned population of 5,900 residents.

Amendment 136 to the Town of Whitchurch-Stouffville's Official Plan (Ballantrae-Musselman's Lake's Environmental Secondary Plan) proposes to increase the population of Ballantrae-Musselman's Lake to 6,230 persons.

In order to support the additional growth proposed through OPA-136, the Region would ultimately need to be able to allocate a water supply capacity of 6,230 residents to the Town.

### 2.2 Municipal Water Allocation – Community of Ballantrae-Musselman's Lake

The existing Regional Water Supply System was designed for a population of 5,900 residents, and the Region has previously allocated supply capacity to the Town in support of development to a population of 5,600 residents. The Town has formally requested that the Region approve allocation for the remaining built capacity of the water supply system, to the design population of 5,900 residents.

Approving this allocation request means that the Region cannot support additional growth beyond 5,900 residents in Ballantrae and Musselman's Lake without upgrades to the Regional Water Supply.

### 2.3 Oak Ridges Moraine Conservation Plan

The Oak Ridges Moraine Conservation Plan (ORMCP) is a document which was developed to provide land use and resource management direction for the lands within the Moraine. The Study Area lies wholly within the Oak Ridges Moraine, and the following Land Use Designations apply:

- Ballantrae is classified as a Settlement Area;
- The lands surrounding Musselman's Lake are classified as Rural Settlement;
- The lands surrounding the communities are defined as either Natural Core Area, Natural Linkage Area, or Countryside Area.

With respect to water servicing, the ORMCP defines the requirements by which water servicing may be provided in the Moraine. Among the conditions is that "the construction or expansion of partial services is prohibited" unless certain exemptions specified in the ORMCP apply. For Ballantrae-Musselman Lake, the

Province has confirmed that where proposed development is within the service area and capacity limits outlined in the 1989 Class EA, connections for existing and future service areas as approved in the 1989 Class EA would be consistent with the ORMCP. This means that all new development beyond that contemplated in the 1989 Class EA cannot be on partial services. Therefore, the current population allocation of water supply of 5,900 residents would be considered “grandfathered” partial servicing. Any new development beyond the 5,900 residents would have to be on full services, such as municipal water and a private wastewater treatment plant.

## 2.4 Ballantrae-Musselman’s Lake Servicing Report

This report does not address wastewater collection and treatment, but rather focusses on water supply requirements. Currently, wastewater treatment is provided through private individual on-site septic systems for the majority of the community. A private wastewater treatment plant provides wastewater servicing to the golf course development in northwest Ballantrae.

The Region does not operate a wastewater treatment facility in Ballantrae-Musselman’s Lake, and there are no plans for Regional wastewater treatment infrastructure. In considering the ORMCP, any development beyond the 5,900 that will be serviced by the municipal water supply system will have to be connected to full services, such as the existing wastewater treatment plant.

## 2.5 York Region Water and Wastewater Master Plan Updates

The Region’s 2009 Water and Wastewater Master Plan Update identified a need for “a new well to supply form capacity in the community of Ballantrae-Musselman’s Lake”. This was addressed through the construction of Well 3 in 2013.

The Region’s current (2016) Water and Wastewater Master Plan lists the “Ballantrae Permit to Take Water Increase” as a proposed project; which is this present study.

No other water infrastructure requirements are listed for this water service area.

## 2.6 MECP Permit to Take Water

The Region’s current Permit to Take Water (Number 2323-AM3HES, issued May 16, 2017) limits the volume of groundwater which can currently be extracted from the aquifer from which supplies the drinking water system.

The Permit to Take Water states that the maximum daily taking of water from any combination of the wells shall be limited to 4,580 m<sup>3</sup>/day. The Permit is renewable on a five-year basis.

## 2.7 MECP Drinking Water Works Permit

The Region’s current Drinking Water Works Permit (Number 013-206, issued January 29, 2010) limits the groundwater treatment capacity to 5,236 m<sup>3</sup>/d. Because this is higher than the PTTW, the PTTW limits the water production in this system.

### 3 OVERVIEW OF EXISTING WATER SUPPLY INFRASTRUCTURE

The details of the existing water supply system are provided in *Technical Memorandum TM1 – Identification of Problem or Opportunity*. The full memo is provided in **Appendix A**, and a summary is provided in this section.

#### 3.1 Existing Water Supply and Distribution System

The water supply and distribution system was commissioned in January 1997, with an ultimate design population of 5,900 residents. Two duty wells were provided, each with a water supply capacity of 2,618 m<sup>3</sup>/day (30.3 L/s).

A third well was constructed in 2013 to ensure that the water supply requirements could still be met with one well out of operation. The system now operates with two duty wells and one standby well. The duty/standby status is rotated through the three wells sequentially, such that water is drawn from all three wells in a typical day. The well details are provided in *Table 3-1*.

*Table 3-1 Existing Well Capacities*

Well #	Location	Commissioned	PTTW Max Daily Water Taking [m <sup>3</sup> ]	2015 Max Daily Water Taking [m <sup>3</sup> ]	2015 Average Daily Water Taking [m <sup>3</sup> ]
1	15341 McCowan Road	1997	2,618	1,533	301
2	15341 McCowan Road	1997	2,618	1,251	268
3	15400 Highway 48	2013	2,618	1,400	580

Based on the existing MECP PTTW, each of the wells has a permitted capacity of 2,618 m<sup>3</sup>/d (30.3 L/s) and a Total Daily Water Taking of 4,580 m<sup>3</sup>/d. The existing MECP DWWP permits a treatment capacity of 5,236 m<sup>3</sup>/d (60.6 L/s).

#### 3.2 Water Supply Requirements

The existing permitted water taking capacity for the Ballantrae system is 4,580 m<sup>3</sup>/day, and the current serviceable population from the existing well supply has been established as 5,900 persons by York Region. The basis for this serviceable population is an average day demand of 269 Lpcd and a design maximum day factor of 2.9 (as stated in the Region’s 2016, Master Plan).

Because the per-capita water consumption represents a blended rate (accounting for residential and employment populations), the effective per-capita water consumption can vary significantly. The main reason for this is that the future industrial, commercial and institutional (ICI) water demands are less predictable than residential customers. As a result, the Region is applying a design water consumption of 300 Lpcd to account for potential uncertainties in the future water supply requirements. The existing and buildout water supply requirements are presented in *Table 3-2*.

Table 3-2 Water Supply Requirements

Population	Average Demand <sup>(1)</sup> (Lpcd)	Max Day Factor	Required Well Production <sup>(2)</sup> (m <sup>3</sup> /day)	Comment
5,900	269	2.90	4,602	Current Servicing Basis (PTTW = 4,580 m <sup>3</sup> /day)
6,230	300	2.90	5,420	Buildout Demand, based on current design standards

Therefore, the required well supply and treatment capacity required to meet the full build-out demand for Ballantrae is 5,420 m<sup>3</sup>/d (62.7 L/s).

### 3.3 Water Storage

The existing elevated tank connected to the Ballantrae system has a volume of 2,760 m<sup>3</sup>. The design storage volume is typically established based on the sum of the following:

- A. **Fire Storage:** For small pressure districts with smaller commercial, medium and high-density developments like Ballantrae, the Region's Design Guidelines for Fire Flow identifies a fire flow requirement of 166 L/s for a duration of 2 hours. This results in a volume of **1,195 m<sup>3</sup>**.
- B. **Equalization Storage:** The equalization storage is typically established as 25% of the maximum day demand. The actual maximum day demand is 3,843 m<sup>3</sup>(84% of theoretical demand based on the data Region's consumption data), resulting in an equalization storage of **961m<sup>3</sup>**.
- C. **Emergency Storage:** The emergency storage is recommended to be equal to 25% of the sum of the Fire and Equalization Storage Volumes. In this case, the emergency storage requirement would be **539 m<sup>3</sup>**.

The recommended water storage volume for Ballantrae is therefore 2,695 m<sup>3</sup>, meaning that there is an excess of 65 m<sup>3</sup> during a maximum day plus fire demand based on actual consumption data. the future demands may result in a negligible deficit in storage. This is detailed in *Technical Memorandum TM2A – Review of Ballantrae Storage Requirements*, which is provided in **Appendix B** The design storage requirement is a function of the maximum day demands within the system, and should be monitored by Operations as system demands increase.

## 4 PROBLEM STATEMENT

The Problem Statement for the Ballantrae Long-Term Water Supply Class EA is provided below.

Amendment No. 136 (OPA 136) to the Town of Whitchurch-Stouffville Official Plan (Ballantrae-Musselman's Lake and Environs Secondary Plan) proposes to increase the population of Ballantrae-Musselman's Lake. Regional approval of the Amendment is pending. The Firm Capacity of the municipal water supply and the existing water storage volume are not adequate to meet the long-term water supply requirements of the community, based on York Region's current design criteria. Servicing the proposed growth may require an increase in the water supply and storage volumes, and also the Permit to Take Water maximum daily water taking. For this, a Schedule B Class EA is required.

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## 5 ALTERNATIVE SOLUTIONS

The details of the alternative water supply solutions are provided in *Technical Memorandum TM2 – Identification of Alternative Solutions*. The full memo is provided in **Appendix B**, and a summary is provided in this section.

While the Background Review identified a theoretical storage deficit (based on typical design criteria), further review of the system operation has confirmed that there is no functional deficit at this time. As the community grows, the Region will monitor the effects of the additional development on the maximum daily demands and continue to review the storage volume requirements. As such, this Class EA will focus solely on the immediate water supply requirements. If storage is deemed necessary at a later date, a similar process will be initiated to address that need.

### 5.1 List of Alternative Solutions

As part of the EA process, the Alternative solutions were identified:

1. **Do Nothing:** Permit the Growth, but do not increase the water supply;
2. **Limit Community Growth:** Limit growth to the capacity of the existing water supply;
3. **Implement Water Conservation:** ‘Stretch’ the existing water supply by using less water per person;
4. **Expand Existing Well Sites:** Provide an additional well on existing site, or higher capacity pumps in existing wells;
5. **Construct a New Well:** Establish a third well site, and a new groundwater treatment process;
6. **Rely on Private Wells:** Permit new development to be serviced by private wells;
7. **Develop a New Surface-Water Supply:** Build a treatment plant;
8. **Extend a Nearby Water System:** Pipe water into Ballantrae from Stouffville or Newmarket; and
9. **Implement Water Reclamation and Re-Use:** Reduce reliance on the Regional water supply by encouraging adoption of “grey-water” systems.

### 5.2 Initial Assessment of Environmental Considerations

To identify the scope of environmental investigations that will need to be undertaken as part of this Class EA, a preliminary assessment of the environmental impacts has been undertaken. A summary of the impacts is provided in *Table 5-1*.

Of the nine alternative solutions identified, seven were carried forward to the Class EA Process. The process did not consider developing a new surface water supply, nor was water reclamation and reuse assessed as a stand-alone alternative (instead, this is considered a component of the water conservation alternative).

Table 5-1 Preliminary Environmental Impacts Matrix

	ALTERNATIVE SOLUTIONS								
	1: Do Nothing	2: Limit Community Growth	3: Water Conservation	4: Expand Existing Wells	5: Construct New Well	6: Private Wells	7: New Surface Water Supply	8: Extend Adjacent System	9: Water Reclamation and Reuse
CARRY FORWARD TO EA? →	YES	YES	YES	YES	YES	YES	NO	YES	NO <sup>(1)</sup>
Impacts during construction to pedestrian/cyclist/vehicle safety, noise, traffic operations and transportation services	○	○	○	●	●	○	●	●	○
Impacts to water and wastewater facilities, operations and maintenance, integrity and redundancy of system, clearance around pipelines	●	○	○	●	●	○	●	●	○
Impacts to life cycle costs of water and wastewater facilities	○	○	○	●	●	●	●	●	○
Adjacent land uses	○	○	○	○	●	○	●	●	○
Recreation	○	○	○	○	○	○	○	○	○
Aesthetics	○	○	○	○	●	○	●	●	○
Development activity	●	●	○	○	○	●	○	○	○
Land use policies	●	●	○	○	●	●	●	○	○
Drainage and stormwater management (quality and quantity)	○	○	○	○	○	○	○	○	○
Significant natural features	○	○	○	○	●	○	●	●	○
Hydrologic and Aquifer Vulnerability in accordance with the requirements of the ORMC Plan (as applicable)	○	○	●	●	●	●	○	●	○
Aquatic habitat and communities	○	○	○	○	○	○	●	○	○
Wildlife and wildlife habitat	○	○	○	○	●	○	●	●	○
Vegetation and vegetation communities	○	○	○	○	●	○	●	●	○
Archaeological/Heritage significance	○	○	○	○	●	○	●	●	○
Groundwater effects on adjacent wells, rivers and streams during and after construction	○	○	○	●	●	●	○	○	○
Property requirements and/or restrictions	○	○	○	○	●	●	●	○	○
Construction and maintenance costs	○	○	○	●	●	●	●	●	○
<b>LEGEND:</b>	○ No Impact			● Probable Impact					

1. Water Reclamation and Reuse will be considered as part of Alternative 3 (Water Conservation)

## 6 CONFIRMATION OF CLASS EA SCHEDULE

As stated in Section 1 of this Project File Report, this Class EA was initiated as a 'Schedule B' activity.

The specific Class EA Schedule requirements for each of the seven Alternative Solutions carried forward were in *Technical Memorandum TM3 – Schedule Selection of Potential Solutions*. The full memo is provided in **Appendix C**.

Upon review of the MCEA, the Ballantrae Wells EA should proceed under Schedule B.

The MCEA review of the alternatives is summarized in *Table 6-1*.

*Table 6-1 Classification of Potential Solutions for Ballantrae Wells Class EA*

Alternative		Class EA Schedule
1	Do Nothing	N/A
2	Limit Community Growth	N/A
3	Water Conservation	N/A
4	Expand Existing Well System	B
5	Construct New Well	B
6	Install Private Wells	N/A
8	Extend Nearby Water System	A+

*Note: Alternatives 7 and 9 (identified in TM2 – Identification of Alternative Solutions) were not carried forward to the detailed evaluation of alternatives.*

Based on the above, undertaking this Class EA as a Schedule B will satisfy the approval requirements for each of the alternatives being considered. As such, Phases 1 and 2 of the Class EA process must be completed before the recommended alternative can proceed to implementation.

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## 7 POTENTIAL ENVIRONMENTAL IMPACTS

A series of Environmental Screening Documents were prepared for the Region by Golder Associates as part of the overall Class Environmental Assessment (Class EA) process:

- Hydrogeological Impact Assessment
- Archaeological Screening
- Cultural Heritage Screening
- Natural Environment Screening
- Geotechnical Desktop Study Report

A summary of the main conclusions from these reports is provided in *Technical Memorandum TM4 – Inventory of the Environment*. That memo is provided in **Appendix D**.

The full Hydrogeological Impact Assessment is provided in **Appendix E**, and the other environmental studies are provided in **Appendices I through L**.

### 7.1 Hydrogeological Impact Assessment

The Hydrogeological Impact Assessment considered the impacts that an increase in the permitted water taking (from 4,580 m<sup>3</sup>/day to 5,420 m<sup>3</sup>/day) could have on the aquifers.

There are three main aquifers under the community which are currently used as groundwater supply sources:

1. The **Oak Ridges Aquifer Complex (ORAC)** is the shallower of the three aquifers. Within the Water Service Area, we anticipate that most of the domestic (residential) wells have been decommissioned since the water distribution system was commissioned in 1997. Outside of the Water Service Area, most of the domestic wells are likely drawing water from the ORAC;
2. The **Thornccliffe Aquifer Complex (TAC)** is the middle aquifer, and;
3. The **Scarborough Aquifer Complex (SAC)** is the deepest of the aquifers. The existing municipal wells draw from the SAC.

The hydrogeological impact assessment determined that for the small increase in maximum day water takings, the effects on the SAC (in terms of groundwater recharge, aquifer drawdown, and area of influence) will all be relatively minor, and not likely to have any impact on other wells that are drawing water from the SAC.

The SAC is also effectively hydraulically-separated from the ORAC, so there is no anticipated impact on any wells drilled into that shallower aquifer.

### 7.2 Environmental Features

The significant environmental features and considerations were identified in the four additional studies which were undertaken. These studies focussed on the following aspects of the overall environment:

#### 7.2.1 Archaeology

Whitchurch Township was established in 1792, and York Region's Archeological Potential Model indicates that much of the Study Area exhibits a degree of archaeological potential. These areas are generally located along the numerous creeks and streams which cut through the Study Area, and could contain archaeological artifacts.

There are also 26 Registered Sites within the Study Area. These sites need to be avoided to the extent possible, which could limit the sites available for some of the infrastructure that would be required by some of the Alternative Solutions.

### 7.2.2 Cultural Heritage

There are four known cultural heritage resources within the Study Area, in two existing sites:

1. 15336 Ninth Line:
  - Churchill Community Centre (a congregational church, c. 1841)
  - Churchill Cemetery.
2. 2684 Vivian Road
  - Pine Orchard Friends' Cemetery (a pioneer cemetery, c. 1814)
  - Ontario Heritage Foundation Plaque on the Pine Orchard Union Church.

In addition to these, other potential heritage resources may also exist. These resources need to be avoided to the extent possible, which could limit the sites available for some of the infrastructure that would be required by some of the Alternative Solutions.

### 7.2.3 Natural Environment

The Study Area contains numerous natural environment features:

- Numerous creeks, tributaries, lakes and ponds;
- Oak Ridges Moraine;
- Greenbelt Planning Area;
- Designated Greenlands Systems;
- Meadows, forests, woodlands;
- Provincially-Significant wetlands;
- Areas of Natural Scientific Interest (ANSIs);
- Warm, cool, and coldwater fish species; and,
- Species at Risk, and supporting habitats.

All of these significant features were documented on a map of the Study Area. These features need to be avoided to the extent possible, which could limit the sites available for some of the infrastructure that would be required by some of the Alternative Solutions.

### 7.2.4 Geotechnical

The Subsurface conditions were also reviewed to assess potential construction challenges that might present obstacles that are difficult or expensive to overcome.

The Surficial Geology review indicates that the Study area contains mostly silt, sand, and gravel deposits. Sand and clay are found predominantly in the northwest portion of the Study Area. Silts and clay till are present in the south of the Study Area.

Retreating glaciers have deposited boulders, which may have to be removed to build new infrastructure (such as watermains). Ultimately, removal of boulders could have cost impacts.

### 7.3 Summary

While this EA did not focus on specific sites for the potential facilities which could be needed to support the increased water supply, the environmental considerations were reviewed and plotted on a common map. The overlay of the sites to be avoided indicated that there are a significant number of potential sites within a reasonable distance of the Service Area which could support the potential future facility needs associated with the construction of a new well or watermain connections to an adjacent municipality.

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## 8 EVALUATION OF ALTERNATIVE SOLUTIONS

The details of the evaluation of the Alternative Solutions are provided in *Technical Memorandum TM6 – Identification of the Environmental Impacts* and *Technical Memorandum TM7 – Evaluation of Alternative Solutions*. The full memos are provided in **Appendix F and G**, and a summary is provided in this section.

The alternatives carried forward in the Class EA Process for evaluation were the following:

1. **Do Nothing:** Permit the Growth, but do not increase the water supply;
2. **Limit Community Growth:** Limit growth to the capacity of the existing water supply;
3. **Implement Water Conservation:** ‘Stretch’ the existing water supply by using less water per person;
4. **Expand Existing Well Sites:** Provide an additional well on existing site, or bigger pumps in existing wells;
5. **Construct a New Well:** Establish a third well site, and a new groundwater treatment process;
6. **Rely on Private Wells:** Permit new development to be serviced by private wells;
7. **Develop a New Surface-Water Supply:** Build a treatment plant;
8. **Extend a Nearby Water System:** Pipe water into Ballantrae from Stouffville or Newmarket; and

The alternative solutions were evaluated based on the following criteria:

- The Technical Feasibility of the solution;
- The ability of the solution to satisfy the growth projections in Town of Whitchurch-Stouffville OPA-136;
- The ability of the solution to satisfy Regional Design Standards;
- The ability of the solution to comply with Legislative Requirements;
- The Operational Flexibility of the solution (present, and future expandability);
- The potential impacts on the Natural Environment;
- The potential impacts on the Social-Cultural Environment; and,
- The life-cycle cost of the solution.

Table 8-1 Evaluation of Alternative Solutions

Alternative	Technical Feasibility	Satisfies OPA-136	Satisfies Design Standards	Complies with Legislative Requirements	Provides Operational Flexibility	Impact on Natural Environment	Impact on Socio-Cultural Environment	Cost	OVERALL RANKING
1 Do Nothing	Red	Red	Red	Red	Red	Green	Red	Yellow	<b>7</b>
2 Limit Community Growth	Green	Red	Green	Yellow	Orange	Green	Red	Green	<b>4</b>
3 Implement Water Conservation	Orange	Orange	Orange	Yellow	Orange	Green	Yellow	Yellow	<b>2</b>
<b>4 EXPAND THE EXISTING REGIONAL WELL SITES</b>	Green	Green	Green	Yellow	Yellow	Green	Green	Green	<b>1</b>
5 Construct a New Well on a New Site	Green	Green	Green	Yellow	Green	Orange	Yellow	Red	<b>3</b>
6 Allow Servicing of New Development Through Private Wells	Orange	Orange	Green	Red	Yellow	Yellow	Orange	Orange	<b>5</b>
7 Extend Adjacent System	Orange	Green	Green	Orange	Green	Red	Red	Red	<b>6</b>
<b>LEGEND</b>									
Lowest Impact ---- Most Preferred	Yellow			Orange			Red ---- Least Preferred		

According to the overall ranking in *Table 8-1*, the preferred solution is to Expand the Existing Regional Well Sites (Alternative 4).

## 9 RECOMMENDED PREFERRED SOLUTION

The recommended preferred solution was determined to be Alternative 4: Expand the Existing Well Sites, and this alternative was presented as such through the stakeholder consultations.

The details of the recommendation are provided in *Technical Memorandum TM8 – Confirmation of the Preferred Solution*. The full memo is provided in **Appendix H**, and a summary is provided in this section.

### 9.1 Upgrade Options

Through the review of the alternatives and the technical requirements to service the full buildout, the following upgrades are required:

1. Increase the combined firm pumping and treatment capacity of the three wells from 5,236 m<sup>3</sup>/day (60.6 L/s) to 5,420 m<sup>3</sup>/day (62.7 L/s) (a total increase 184 m<sup>3</sup>/day); and,
2. Increase the existing Permit to Take Water limit from 4,580 m<sup>3</sup>/day to 5,420 m<sup>3</sup>/day (a permit increase of 840 m<sup>3</sup>/day).

Following a more detailed assessment of the existing capacities of the individual well facilities, it was determined that the following specific upgrades could be considered:

- a) Increase the capacity of two of the three wells from 2,618 m<sup>3</sup>/day (30.3 L/s) to 2,802 m<sup>3</sup>/day (32.4 L/s); or,
- b) Increase the capacity of all three wells from 2,618 m<sup>3</sup>/day (30.3 L/s) to 2,710 m<sup>3</sup>/day (31.4 L/s).

Overall, the changes required were determined to be minor in nature, consisting of modifications to the pump operation set-points and possibly some minor upgrades to some of the additional mechanical equipment at the facilities.

The result is that under the maximum day demands, the pumps will operate at a slightly higher speed than what they were initially selected to operate at under the previous design demands.

Regarding water storage for the Ballantrae-Musselman's Lake service area, The Region is aware of the additional storage requirements associated with an increasing population in Ballantrae and Musselman's Lake. The Region is aware that additional storage will need to be considered as the community grows, but any additional storage needs will be addressed as part of a separate study.

### 9.2 Environmental Impacts and Mitigating Measures

#### 9.2.1 Hydrogeological Impact

The recommended preferred solution proposes slightly increased groundwater pumping rates. This proposed pumping rate falls within the interpreted area of contribution as defined by the WHPA-D. The increased pumping rate will not result in the capture zones getting larger, so no new drinking water threat parcels (properties) will be added to the existing list of significant drinking water threats for the Ballantrae water supply.

No long-term hydrogeological impacts are anticipated. The Region will continue to monitor and report groundwater levels to the MECP. The process by which this will be undertaken has been documented in a "Shallow Groundwater Monitoring and Mitigation Plan" (Golder, January 4, 2019), which is included as **Appendix R**.

#### 9.2.2 Archaeological Impact

There are no additional land requirements associated with the Recommended Alternative Solution, so we do not anticipate that any Aboriginal or Treaty rights will be adversely affected.

As no additional outside works are required, we do not anticipate discovering any objects of archeological significance.

### **9.2.3 Socio-Cultural Impact**

The recommended preferred solution has upgrades confined to the insides of the existing buildings. There will be no construction-related traffic impacts, and no noise or dust will be generated in implementing the upgrades.

No cultural resources will be impacted.

### **9.2.4 Natural Environment Impact**

Upgrades required for recommended preferred solution will be confined to the insides of the existing buildings, so there will be no impact to the natural environment. The potential impacts to the natural environment are addressed in the Hydrogeological Impact, above.

### **9.2.5 Geotechnical Impact**

Upgrades required for recommended preferred solution will be confined to the insides of the existing buildings, so there will be no Geotechnical impacts.

## **9.3 Cost and Schedule**

The cost of increasing the set-points in order to increase the water supply capacity of the existing wells is estimated as less than \$50,000, and considers that some minor mechanical upgrade may be required in order to provide the required hydraulic capacity through the treatment processes.

As the Town of Whitchurch-Stouffville has requested capacity allocation to the full build-out demand population of 6,230 residents, it is recommended that the Region proceed with the upgrades in 2018.

## **9.4 Next Steps**

The Region should consider undertaking a program to assess the condition of the existing equipment, and to confirm the operability of the pumps at the required set-points. Depending on the condition of the pumps – particularly those at the Well 1 and 2 site – the Region may opt to replace the existing pumps and/or motors.

The Region should proceed with an application with the Ministry of the Environment and Climate Change to formally increase their Permit to Take Water limit from 4,580 m<sup>3</sup>/day to 5,420 m<sup>3</sup>/day.

The Region should proceed with an application with the Ministry of the Environment and Climate Change to formally increase their Drinking Water Works Permit capacity from 5,236 m<sup>3</sup>/day to 5,420 m<sup>3</sup>/day.

## 10 STAKEHOLDER CONSULTATION

This section details the extent of Stakeholder consultation that was undertaken in fulfillment of the requirements of the Class EA process.

### 10.1 Public Contact Requirements

In accordance with the Class EA Process, Schedule 'B' activities require two mandatory points of contact:

1. In Phase 2 of the process, after the Evaluation of the Alternative Solutions and before the Selection of the Preferred Solution; and,
2. The Notice of Completion.

In addition to these, there is a Discretionary Public Consultation at the close of Phase 1 to review the problem or opportunity.

### 10.2 Contact Summary

Through this Class EA, a total of four public contacts were completed:

1. The Notice of Commencement;
2. Public Consultation Centre #1;
3. Public Consultation Centre #2; and,
4. The Notice of Completion.

As such, the public contact undertaken through this Class EA exceeded the minimum requirements

### 10.3 Stakeholder Contact List

A stakeholder contact list was prepared during the initial stages of the Study and was updated during the study. The initial list included the area residents who had expressed interest in the most recent Class EA for Well #3 (initiated in 2010).

A copy of this list is included in **Appendix M**.

### 10.4 Consultation Details

#### 10.4.1 Notice of Study Commencement

The Notice of Study Commencement was prepared to describe the Environmental Assessment process, the objective of the project and the Problem Statement. It was issued on June 23, 2016. The Notice of Study Commencement was distributed by the following means:

- Posted on the York Region Website;
- Letter mailed or emailed directly to Stakeholder Contact List; and,
- Newspaper advertisement in the Stouffville Sun Tribune on June 23 and June 30, 2016.

A copy of the Notice is included in **Appendix N**. The timing of the issuance of the Notice of Commencement coincided with the Discretionary Public Consultation at the close of Phase 1 of the Class EA Process.

The stakeholders on the mailing lists (direct mail and e-mail) were also provided with a comment form which they could complete and send back to the Region.

#### 10.4.2 Public Consultation Centre #1

The first Public Consultation Centre undertaken for this Class EA was an additional consultation selected by the Region which is not required through the Class EA Process. It took place on November 21<sup>st</sup>, 2016, following the identification of the impacts of the Alternative Solutions on the Environment, and before the formal evaluation of the Alternative Solutions.

The purpose of this PCC was to present the environmental impacts to the public to get their input and to ensure that they were satisfied that no significant environmental impacts were omitted from the Study.

Stakeholders were notified of this event as follows:

- Posted on the York Region Website;
- Letter mailed or emailed directly to Stakeholder Contact List; and,
- Newspaper advertisement in the Stouffville Sun Tribune on November 10 and November 17, 2016.

In advance of the PCC, the Study Team also met with the following Agencies directly:

- Toronto and Region Conservation Authority (August 23, 2016)
- Town of Whitchurch-Stouffville (November 10, 2016)

The PCC followed an informal open house format with display boards presenting the findings of the study including the evaluation of alternatives and the identification of the preliminary preferred solution. The display boards were also posted to the project website.

Approximately 50 individuals attended the first PCC. The Region received 16 comment forms, and responses were sent to the commenters where requested.

Copies of the Notice, Display Boards, Attendance Sheets, comments received and responses issued are included in **Appendix O**.

#### 10.4.3 Public Consultation Centre #2

The second Public Consultation Centre undertaken for this Class EA is the first mandatory step in the EA Process. This consultation took place on April 24<sup>th</sup>, 2017, following the evaluation of the Alternative Solutions, and had the purpose of advising the interested parties of how the evaluation was conducted, as well as the outcome of the evaluation. During this PCC, we presented the “Recommended Preferred Solution” and invited the Public to comment before confirming it as the final Preferred Solution.

Stakeholders were notified of this event as follows:

- Posted on the York Region Website;
- Letter mailed or emailed directly to Stakeholder Contact List; and,
- Newspaper advertisement in the Stouffville Sun Tribune on April 13 and April 20, 2017.

In advance of the PCC, the Study Team also met with the following Agencies directly:

- Toronto and Region Conservation Authority (March 16<sup>th</sup>, 2017)
- Town of Whitchurch-Stouffville (March 23<sup>rd</sup>, 2017)
- Lake Simcoe Region Conservation Authority (April 21, 2017).

The PCC followed an informal open house format with display boards presenting the findings of the study including the evaluation of alternatives and the identification of the preliminary preferred solution. The display boards were also posted to the project website.

Approximately 40 individuals attended the second PCC. The Region received 13 comment forms, and responses were sent to the commenters where requested.

Copies of the Notice, Display Boards, Attendance Sheets, comments received and responses issued are included in **Appendix P**.

## 10.5 First Nations and Métis Consultation

First Nations and Métis organizations that potentially have an interest or stake specifically for this project were identified to provide them with an opportunity to provide their input and to address their comments/concerns.

During the Municipal Class EA, the project team initiated contact with First Nations and Métis groups and organizations, including the following:

- Alderville First Nation;
- Beausoleil First Nation;
- Curve Lake First Nation;
- Chippewas of Georgina Island First Nation;
- Hiawatha First Nation;
- Huron-Wendat Nation;
- Métis Nation of Ontario;
- Rama First Nation;
- Mississaugas of the New Credit;
- Mississaugas of Scugog Island; and
- Williams Treaties First Nations;

A copy of the letters is provided in **Appendix Q**. These organizations were also provided all of the Public Consultation Materials from the Study.

Following our contact with the above groups, several requested copies of the Archaeological Study that was completed for the Study.

The First Nations who contacted the Study Team were supportive of the Recommended Preferred Solution. The fact that the solution requires no additional land protects their Treaty Rights, and results in no impact to the Oak Ridges Moraine. They were also supportive of the commitment to long-term monitoring and reporting of aquifer levels to the MECP.

## 10.6 Previous Notice of Study Completion and Report Review (2017)

The Notice of Study Completion, dated October 5, 2017, was prepared to notify the public of the completion of this study, and to advise of opportunities to review the report. That notice was issued by the following means:

- Posted on the York Region Website;
- Letter mailed or emailed directly to Stakeholder Contact List; and,
- Newspaper advertisement in the Stouffville Sun Tribune on October 5 and October 12, 2017.

The Report had been made available for public review and comment at the following locations, from October 5, through November 3, 2017:

Table 10-1 Project File Review Locations

Municipality	Location	Review Hours
Town of Whitchurch-Stouffville	<b>Town Hall</b> 111 Sandiford Dr, Whitchurch-Stouffville, ON L4A 0Z8 (905) 640-1900	Monday-Friday 8:00 AM – 5:00 PM (Closed weekends)
Regional Municipality of York	<b>York Region Administrative Centre</b> 17250 Yonge Street Newmarket, ON L3Y 6Z1 (877) 464-9675	Monday-Friday 8:30 AM – 4:30 PM (Closed weekends)

Following receipt of technical comments submitted by the MECP, the 2017 Notice of Completion was withdrawn, and additional technical work completed. The MECP confirmed that their technical requirements were addressed in a letter dated January 4, 2019.

## 10.7 Notice of Study Completion and Report Review

A Notice of Study Completion, dated January 17, 2019, was prepared to notify the public of the completion of this study, and to advise of opportunities to review this report. The notice was issued by the following means:

- Posted on the York Region Website;
- Letter mailed or emailed directly to Stakeholder Contact List; and,
- Newspaper advertisement in the Stouffville Sun Tribune on January 17 and 24, 2019.

The Notice of Study Completion is provided in **Appendix N**.

This Report has been made available for public review and comment at the following locations, from January 21, through February 20, 2019:

Table 10-2 Project File Review Locations

Municipality	Location	Review Hours
Town of Whitchurch-Stouffville	<b>Town Hall</b> 111 Sandiford Dr, Whitchurch-Stouffville, ON L4A 0Z8 (905) 640-1900	Monday-Friday 8:00 AM – 5:00 PM (Closed weekends)
Regional Municipality of York	<b>York Region Administrative Centre</b> 17250 Yonge Street Newmarket, ON L3Y 6Z1 (877) 464-9675	Monday-Friday 8:30 AM – 4:30 PM (Closed weekends)

## 10.8 Summary of Class EA Contact Dates

The schedule of the Class EA Contact Dates is provided in **Table 10-3**.

*Table 10-3 Summary of Class EA Contact Dates*

<b>Milestone</b>	<b>Date</b>
Notice of Commencement	June 3, 2016
Phase I Public Consultation Centre	November 21, 2016
Phase II Public Consultation Centre	April 24, 2017
Notice of Study Completion	January 17, 2019

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