October 12, 2018

The Regional Municipality of Durham Works Department
605 Rossland Road East, Level 5
Whitby, Ontario
L1N 6A3

Attention: Mr. Donald Yu, P.Eng.
Project Manager

Dear Donald:

Re: Class Environmental Assessment Addendum
Provision of Additional Water Supply Capacity for the Community of Cannington in the Township of Brock

Please find the enclosed draft copy of the Class Environmental Assessment (EA) Addendum for the referenced project.

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

Yours very truly,

R.V. ANDERSON ASSOCIATES LIMITED

Allan Choi, P.Eng., PMP
Project Engineer
Provision of Additional Water Supply Capacity for the Community of Cannington in the Township of Brock

Class Environmental Assessment Addendum
Final

The Regional Municipality of Durham

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October 12, 2018
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Executive Summary

In 2011, the Region of Durham (Region) completed a ‘Schedule C’ Class Environmental Assessment (EA) Study for “Provision of Additional Water Supply Capacity for the Community of Cannington in the Township of Brock”. The Class EA had been initiated to address the following problem/opportunity statement:

- Additional water supply capacity is required to increase security of supply (backup capacity) for the existing system should one or more of the six active groundwater production wells fail or require maintenance, and
- Cannington has available developable land within its existing approved urban area; however, development is dependent on additional water and wastewater treatment capacity.

The evaluation process had concluded with the selection of two preferred alternatives:

- Provide additional well capacity through additional municipal well(s), and
- Provide capacity through water conservation

Following the completion of the Class EA, property acquisition of the proposed site of the additional municipal wells did not occur until 2016, much later than the implementation schedule originally indicated in the 2011 Environmental Study Report (ESR).

In March 2017, the Region initiated an Addendum to the Municipal Class EA to review the planning and design process and the current environmental setting to ensure that the project and mitigation measures are still valid given the current planning context and legislation. In addition, the following activities were also included as part of the Addendum for the proposed site of the municipal wells.

- Public, Agency, First Nations, and Aboriginal Consultation
- Construction and testing of an additional test well on the same site as the original test well, in accordance with the 2011 Class EA.
- Stage 2 and Stage 3 Archaeological Assessments
- Natural Environment Inventory and Impact Assessment Update
• Geotechnical and Hydrogeological Investigations.

This report has been prepared to summarize the activities that were performed during the Class EA Addendum.
1.0 **Introduction**

1.1 **Project Objective**

The Community of Cannington, located within the Township of Brock in the Regional Municipality of Durham (Region), has five active groundwater wells, within three well fields that supply approximately 2,100 people with potable water. The current rated capacity of the wells is 21.6 L/s (0.4 MIGD). The Region has determined that additional capacity is required for redundancy (in the case that a well needs to be shut down for repair) and to support additional growth.

Based on existing development, registered pending lots and planned development, Durham Region undertook a Schedule ‘C’ Class Environmental Assessment in 2011 to evaluate alternatives for providing additional water supply capacity for the Cannington Urban Area.

The recommendations documented in the 2011 Environmental Study Report (ESR) are as follows:

- *The preferred alternative is to provide additional well capacity through additional municipal well(s) to provide a capacity of 9.3 L/s.*
- *The Region is to proceed with property acquisition*
- *The Region is to proceed with the preliminary and detailed design of the new municipal well and remaining approvals.*
- *The Region is to proceed with Stage 3 archaeological assessment prior to construction.*

1.2 **Class Environmental Assessment Addendum**

Since the completion of the Class EA in 2011, the acquisition of the property of the preferred site did not occur until 2016. Due to the project delay, the Region is conducting an Addendum to the ESR to include developing the planning and design process for the recommended alternative, consulting with original stakeholder and agencies and updating the current environmental setting to ensure that the project and the mitigation measures are still valid given the current planning context.
Notice of Filing of this Addendum will be placed on the public record with the original ESR and shall be given to the public and to the review agencies. A period of 30 calendar days shall be provided for review and response. Only the proposed changes and recommendations in this Addendum are open for review. Copies of the correspondence with the stakeholders are included in Appendix 1.
2.0 Highlights from 2011 Environmental Study Report

A Municipal Class Environmental Assessment (Class EA) is an approved planning procedure that proponents can follow in order to meet the requirements of the Ontario Environmental Assessment Act. The Class EA approach provides for the evaluation of alternative solutions to a problem or opportunity, and includes mandatory requirements for public and regulatory agency input.

The construction of additional municipal wells to an existing water system is considered a Schedule B undertaking. However, the Region had elected to use the more in-depth Schedule C process. Schedule C projects require evaluation of alternative solutions and alternative design concepts of the preferred solution.

The following phases of the planning process were previously completed in accordance with the MEA Municipal Class EA document:

- **Phase 1** - Identify the problem (deficiency) or opportunity.
- **Phase 2** - Identify 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 3** - Examine alternative methods of implementing the preferred solution, based upon the existing environment, public and review agency input, and anticipated environmental effects.
- **Phase 4** - Document in an ESR a summary of the rationale and the planning, design and consultation process of the project as established through the above phases.

The following sections of this report addresses previous assumptions, context, and legislation that have changed since the previous planning and design process undertaken in the original Class EA.

Additional studies were completed during the Class EA Addendum process, including: a Groundwater Exploration and Well Construction study (**Appendix 2**), an Stage 2 and 3 Archaeological Assessment (**Appendix 3**), a Natural Environment Inventory and Impact Assessment Studies (**Appendix 4**), and Geotechnical and Hydrogeological Investigations (**Appendix 5**).
2.1 Additional Water Capacity

The original Class EA noted that the primary purpose of this project is to provide additional water capacity to the Community of Cannington to increase the security of water supply. During the original Class EA, there were six active wells though one (MW6) had to be decommissioned in 2016 due to the presence of organisms. Two existing wells (MW4 & MW8) are located in the Arena Well Field which contains traces of trichloroethylene (TCE). The levels of TCE are below the Provincial Standard and are carefully monitored.

To support the original Class EA, the Region conducted a groundwater exploration program in 2008 by constructing test wells around Cannington. One particular site was identified as having the potential to provide the required 9.3 L/s flow. At the time, only one test well was constructed and tested on this site, as shown in Figure 2.1.

A 3-day aquifer test was performed on the test well and it was able to provide a constant flowrate of 6.9 L/s which was below the required flow of 9.3 L/s. It was determined that two non- GUDI (groundwater under the direct influence of surface water) wells, spaced 75 meters apart on the site could theoretically provide a combined flow rate of 9.3 L/s.

The groundwater quality in the test well met all O.Reg. 170/03 criteria, except for hardness (aesthetic objective).

The Class EA concluded with the recommendation that the Region would complete property acquisition in 2012, and complete construction around 2016 (new well house, disinfection system, diesel generator, etc.). The Region would construct full

![Figure 2.1 – Site of the Proposed Municipal Wells](image-url)
scale production wells to confirm the possible flow capacity of the site.

2.2 Regulatory Requirements

This section of the Class EA Addendum discusses regulatory changes related to the addition of municipal wells and construction.

2.2.1 Clean Water Act (2006) – Source Water Protection

The Clean Water Act (O.Reg. 287/07) was introduced in 2006 to address the recommendations from the Walkerton Inquiry to protect drinking water at its source. The Act officially came into effect after the completion of the original Class EA.

This new regulation requires municipalities, through consultation with their local Source Water Protection Committees, to assess existing and potential threats to their drinking water, and subsequently implement measures to mitigate or eliminate such threats.

2.2.1.1 Source Water Protection Plan

For the Class EA Addendum, the Lake Simcoe Region Conservation Authority (LSRCA) was consulted to review the applicable requirements under the Clean Water Act.

The proposed well site is located in an existing Wellhead Protection Area (WHPA), and the delineation of this area will need to be updated with the inclusion of the proposed Cannington wells. There are 21 water quality threats, as well as water quantity threats to consider when constructing new municipal wells. Some examples of water quality threats include, but are not limited to: waste disposal sites, sewage systems, agricultural material, pesticides, fuel, and road salt.

Water quantity threats are activities that take water from an aquifer or a surface water body without returning the water taken to the same aquifer or surface water body. They also consist of activities that reduce the recharge of an aquifer. However, Cannington is not located within a WHPA-Q (Wellhead Protection Area for Quantity), and therefore these activities are not considered a threat to water quantity.
The Region will be updating the regional groundwater model with the inclusion of the Cannington wells, and the new WHPA delineations would be provided to LSRCA. LSCRA would then determine the water quality threats associated with the wells. The construction of new wells has the potential to change/create new vulnerable areas.

The aforementioned technical work will be undertaken by the Region following the completion of the Class EA Addendum. As part of this report, LSRCA has requested that the WHPA-A delineations (100 meter radius around well) be included, which is shown in Figure 2.2 below. The Test Well TW09-5 that was drilled during the original Class EA, was converted to Production Well PW 1/17. A second well was established during this Class EA Addendum, identified as Production Well PW 2/17. The location of these wells meet the minimum horizontal separation distances from existing sewage systems as required under the Ontario Water Resources Act (O.Reg. 903).
Property owners that could be potentially affected by the creation of the new WHPAs were notified through the distribution of a notice dated September 27, 2018. A copy of this notice can be found in Appendix 1.

**Figure 2.2 – WHPA-A Delineation (100-meter radius) around the proposed wells**

### 2.2.1.2 Safe Drinking Water Act

On April 5, 2018, the Ministry of the Environment, Conservation and Parks (MECP), also formerly known as the Ministry of the Environment and Climate Change (MOECC), posted a new regulation (ERO 013-1840) under the Safe Drinking Water Act that comes into effect on July 1, 2018. The key requirements in the regulation include:

- *Owners of municipal residential drinking water systems within source protection areas under the Clean Water Act must ensure vulnerable areas around new and expanding drinking water systems are identified and mapped.*

- *Owners can only apply for a drinking water works permit once they have confirmation from the source protection authority that vulnerable areas are identified and mapped.*

- *This requirement does not apply if the new or expanded system is necessary to address emergency situations.*

- *Owners cannot provide water to the public from new or expanding drinking water systems until the local source protection plan has been updated to include these systems and it has been approved.*

As discussed in Section 2.2.1.1, the technical work to identify and map new vulnerable areas will be undertaken by the Region in coordination with the Lake Simcoe Region Conservation Authority (LSRCA) following the completion of the Class EA Addendum. Based on this new regulation, the proposed Cannington wells cannot be placed into service until the new Source Protection Plan is updated.
2.2.2 Land Use Plans

A coordinated review of Ontario’s four land use plans (Growth Plan for the Greater Golden Horseshoe, Greenbelt Plan, Oak Ridges Moraine Plan and Niagara Escarpment Plan) began in 2015 and came into effect on July 1, 2017. The following is a discussion of the policies that apply to this Class EA Addendum.

2.2.2.1 Growth Plan for the Greater Golden Horseshoe (2017)

The preferred alternative identified in this Class EA Addendum for the additional water supply to service the Community of Cannington satisfies the requirements of the Growth Plan in accordance with the following sections:

- Section 3.2.6.2 – The preferred alternative for water supply identified as part of this Class EA will increase security of supply and support the growth anticipated for Cannington.
- Section 3.2.6.3 – Based on the requirements of this clause, Cannington is not permitted to extend water or wastewater services from a Great Lakes Source, thus the Plan has been satisfied with the selection of the preferred alternative of a new groundwater source at the existing site.
- Section 3.2.7 – Stormwater management plans for the sites would be developed in accordance with this section.

2.2.2.2 Greenbelt Plan (2017)

The preferred alternative identified as part of this Class EA Addendum for water supply for the Community of Cannington satisfies the requirements of the Greenbelt Plan in accordance with the following clauses:

- Section 4.2.1.1 – The implementation of the preferred alternatives identified as part of this project supports the Community of Cannington in the Township of Brock and the additional growth anticipated.
- Section 4.2.1.2 – The preferred alternative identified would fall under and comply with the clauses listed below as the new groundwater wells will be developed on a previously disturbed site, thus minimizing the impact to the surrounding environment:
a) Minimizing the amount of Greenbelt, and particularly the Natural Heritage System and Water Resource System, traversed and/or occupied

b) Minimizing negative impacts on the existing landscape, including impacts caused by light, intrusion, noise and road salt

c) Avoiding key natural heritage features, key hydrogeologic features or key hydrogeologic areas unless need has been demonstrated and it has been established that there is no reasonable alternative

d) Avoiding specialty crop areas and other prime agricultural areas, unless the need has been demonstrated and it has been established that there is no reasonable alternative

- Section 4.2.2.2 – The extension of municipal water services will only be within the existing settlement area boundary to serve existing uses.

- Section 4.2.3 - Stormwater management plans for the sites would be developed in accordance with this section.

2.2.2.3 Oak Ridges Moraine Conservation Plan (2017)

The location of this project does not fall under the Oak Ridges Moraine Conservation Plan Area.

2.2.2.4 Niagara Escarpment Plan (2017)

The location of this project does not fall under the Niagara Escarpment Plan Area.

2.2.3 Considerations for Climate Change

As per the new regulations set out by the Ministry of the Environment, Conservation and Parks in December 2017, climate change shall be considered during the Class EA process. The following is a general approach to climate change that will be considered for this project:

- Best practices for climate change would be considered during the design to mitigate the impact of the new facility and associated infrastructure. For example, water and energy reducing features would be incorporated into
the building (e.g. water reducing fixtures, energy efficient lighting systems).

- Reliability and redundancy of main treatment processes during power or communications outages due to extreme weather would be considered during design (e.g. backup power).

- Best practices for structural building requirements to accommodate extreme weather would be incorporated to the facility design (e.g. wind load).

- The floor elevation for the new building would be selected to be above the anticipated flood elevations in the area. A stormwater management plan would be developed during design and would consider for changes in severity of storms to reduce the risk of flooding.

- The site does not require any tree removals as the construction is located on grass field. However, the landscaping works will consider the planting of new trees to reduce carbon footprint.
3.0 Addendum Activities

3.1 Public, Agency, and First Nations Consultation

One of the essential components of the EA process is public, agency, and First Nations participation. This Class EA Addendum involved notifying all potentially affected members of the public and review agencies, including those who were notified in the original ESR. In addition, the First Nations and Aboriginal communities that were not specifically consulted during the Class EA were included in the distribution list for this Addendum.

Notices for the Class EA Addendum included publication in local newspapers, posting on the Durham Region website, mail and hand delivery. Copies of the notices and comments received from authority agencies, First Nation communities and the general public are provided in Appendix 1. Responses from the Region and R.V. Anderson Associates Limited to the received comments are also included in Appendix 1.

A summary of the public and agency feedback comments are summarized in Table 3.1.

Table 3.1 - Summary of Public, Agency and First Nations Feedback

<table>
<thead>
<tr>
<th>Name / Agency</th>
<th>Comment / Request</th>
<th>Resolution</th>
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<tr>
<td>Ministry of Environment, Conservation and Parks (MECP) Central Region</td>
<td>MECP issued letter on April 5, 2017 advising that the project will have source water protection implications under the Clean Water Act, 2006 (CWA). Proponents that are proposing drinking water projects that expand the use of existing, or intend to develop a new source of municipal drinking water, should also be aware that the project may result in the delineation of new, or require amendment of existing, WHPAs / IPZ and other vulnerable areas. For assistance in in determining</td>
<td>Conference call was held with MECP on April 3, 2017 to provide project overview.</td>
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<td>Lake Simcoe Region Conservation Authority (LSRCA)</td>
<td>Advised that there are no associated approvals that are needed during the Class EA Addendum. The Region would coordinate any updates required to the South Georgian Bay Lake Simcoe Source Protection Plan.</td>
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<td>whether the proposed project will require new technical work and potentially require amendments to the source protection plan for this area please contact the Project Manager for Drinking Water Source Protection at the local source protection authority.</td>
<td>project, and won't be included in this Class EA Addendum.</td>
</tr>
<tr>
<td>Ministry of Environment, Conservation and Parks (MECP) Central Region</td>
<td>MECP issued letter on June 29, 2018 after reviewing the a draft copy of this Addendum Report. The comments were general in nature and related to impacts/mitigation measures, changes to the environmental setting, and source water protection</td>
<td>Durham Region provided a response letter to the MECP on August 15, 2018 providing clarifications and commitments to the project. The Region will also follow the new notification procedure for submitting the Class EA Addendum notices to the MECP.</td>
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<td>Local Resident</td>
<td>Telephone enquiry – (my) well located on the southwest corner of Cameron St. and Sideline 18A, has experienced low yield during dry weather condition in recent years.</td>
<td>The proposed well (TW09-5) has no water taking or aquifer test activity since 2009. So the low yield of your well shall not be the result of the proposed well. Your well is a shallow well and the proposed well is a deep well (15 m) draw from bedrock aquifer. The upcoming activities will include pump tests to observe the potential impacts (to neighbouring wells).</td>
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<td>Ministry of the Attorney General</td>
<td>All notices of Municipal Class Environmental Assessments should be directed to the following 4 Ministries: Ministry of Aboriginal Affairs, Ministry of Natural Resources, Ministry of Transportation, and the Ministry of the Environment and Climate Change.</td>
<td>The notices of the Class EA have been sent to various agencies, including the 4 noted by the Ministry of the Attorney General.</td>
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<td>Chippewas of Rama First Nation</td>
<td>Please be advised that we have review your letter. I have shared it with Council and we’ve forwarded the information to…Williams Treaties First Nation Process Co-ordinator / Negotiator. Ms. McKenzie will review your letter and take the necessary action if required.</td>
<td>N/A. No further response received.</td>
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<td>Ministry of Tourism, Culture and Sport (MTCS)</td>
<td>MTCS would like to acknowledge the completion of stage 1 and 2 Archaeological Assessment’s (AA) and that a stage 3 AA will be undertaken. MTCS would also like to recommend that until stage 3 has been completed, entered into the Ontario Public Register of Archaeological Reports and its recommendations implemented, the site should be protected from any construction activities and potential impacts.</td>
<td>A Stage 3 AA was undertaken as part of the Class EA Addendum and has been included in Appendix 3. The Stage 3 AA found that a stage 4 AA is not required for the site. No construction activities shall take place…prior to the MTCS confirming in writing that all archaeological licensing and technical review requirements have been satisfied.</td>
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<td>Lake Simcoe Region Conservation Authority (LSRCA)</td>
<td>Pre-Consultation Meeting with LSRCA was held on May 30, 2017. Meeting notes are attached in Appendix 1 of this Class EA Addendum Report.</td>
<td>LSRCA noted that Section 36 of the Clean Water Act outlines the update process for the Source Water Protection Plan. The Region noted that they are planning to update their regional groundwater model in Durham, including drinking water systems beyond Cannington, as part of a separate project. LSRCA recommended that the 2 new Cannington wells be included in the groundwater model update. The Region would update the WHPA</td>
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<td>Name / Agency</td>
<td>Comment / Request</td>
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<td>Local Resident</td>
<td>I am emailing with respect to our concerns regarding the effect the new well being tested near Cannington could have on our water supply. Our address is C20500 Sideroad 18A, Cannington – just south and a little east of where the new well is.</td>
<td>Based on the location of your property, it is not anticipated that pump testing on the new wells will have an effect on your private well. A previous hydrogeological report indicated that your well is located in a separate wellhead protection zone (groundwater capture zone). Nevertheless, as part of the Region’s pump test monitoring program, private wells located within a 500 meter radius of the new wells are being monitored. This includes wells located north of your property, which will be able to capture any affects from the pump testing. Your property is located outside of this 500 meter radius. The Region advised to the resident the 72 hours pump tests had confirmed that there were no impact to the monitoring wells north of their property which are closer to the test wells. Their well is farther</td>
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<td>delineations and provide this information to LSRCA. LSRCA would then determine the water quality threats.</td>
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3.2 Groundwater Well Construction and Testing

The Region previously conducted a groundwater exploration program in 2008 which established that the preferred site had the potential to provide the required 9.3 L/s flowrate. At the time, only one test well was constructed and tested on this site, which was able to provide a constant flowrate of 6.9 L/s. It was anticipated that two non-GUDI (groundwater under the direct influence of surface water) wells, spaced 75 meters apart on the site could theoretically provide a combined flow rate of 9.3 L/s.

As part of this Class EA Addendum, a groundwater construction and testing program was implemented to convert the previous test well into a production well (PW 1/17), and to drill an additional production well (PW 2/17) approximately 85 meters southeast of PW 1/17, to confirm the possible flow capacity of the site.

A ‘Category 2’ Permit to Take Water (PTTW Number 8348-AN2RJQ) was obtained from the MECP for well testing. The well testing program included monitoring of nearby domestic and municipal wells. A copy of the Well Construction and Testing Report is included in Appendix 2.

Based on a 72-hour test conducted on Wells PW 1/17 and 2/17, the following conclusions and recommendations were made:

- Well PW 1/17 can safely be pumped at a rate of 6.4 L/s and Well PW 2/17 can be safely pumped at a rate of 3.2 L/s.
- The combined yield of the wells is 9.6 L/s as tested.
- Based on the performance of Well PW 2/17 during the testing it is possible this well could be pumped at a higher rate if desired. An additional performance test would be required to confirm a higher pumping rate.
- There are no observable off-site impacts due to the pumping of wells PW 1/17 and PW 2/17.
- Wells PW 1/17 and PW 2/17 are not considered to be GUDI.
The groundwater meets the Ontario Drinking Water Quality Standards (ODWQS) O.Reg. 169/03 with the exception of elevated levels of hardness and total dissolved solids, and sodium above the reporting concentration of 20 mg/L but well below the maximum level of 200 mg/L. Nitrilotriacetic Acid (NTA) slightly above the maximum allowable concentration of 0.40 mg/L was found in well PW 2/17. NTA is readily treatable using chlorine disinfection. The cause for the presence of NTA is unknown and it is recommended the well be pumped for a period of several hours and resampled. Table 3.2 below shows the results that exceeded the ODWQS, O. Reg. 169/03.

Table 3.2 – Chemical Analyses Exceeding ODWQS, O. Reg. 169/03

<table>
<thead>
<tr>
<th>Well Sampled</th>
<th>Parameter</th>
<th>Result (mg/L)</th>
<th>ODWQS Objective (mg/L)</th>
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<tbody>
<tr>
<td>PW 1/17</td>
<td>Hardness (1)</td>
<td>340</td>
<td>80-100</td>
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<td>Sodium (2)</td>
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<td>20-200 (see note 2)</td>
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<td>Total Dissolved Solids (1)</td>
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<td>PW 2/17</td>
<td>Hardness (1)</td>
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<td>Sodium (1)(2)</td>
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<td>20-200 (see note 2)</td>
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<tr>
<td></td>
<td>Total Dissolved Solids (1)</td>
<td>655</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>Nitrilotriacetic Acid (3)</td>
<td>0.419</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Notes:

1) Aesthetic Guideline
2) The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
3) Maximum Allowable Concentration (MAC) of NTA is 0.4 mg/L

The wells should be constructed with pitless units to allow access to the full diameter of the well with respect to future maintenance. The wells should be equipped with submersible pumps set with the bottom of the
motors at the top of the well screens. This will prevent the water levels from being drawn down into the well screens which can negatively impact the well and the surrounding aquifer.

Since the well sites have limited protection from confining units, care needs to be taken during construction work undertaken at the well sites. Specific precautions to mitigate against any potential contaminant issues include:

- Excavation for installation of pit less adaptor and yard piping should be kept as shallow as possible. Replacement of the sealant around the well casing during pit less adaptor installation, and suitable sealant should also be installed in the trench at the pit less/water main connection to prevent any possible migration of surface water to the well within the trench backfill. Clean fill material should be used for frost cover protection of the pit less and yard piping at the sites if it is to be built up.

- Storage of our fuels/chemicals should have secondary containment and preferably be off site. Refueling of equipment should preferable be done off site.

- Suitable spills containment and absorbent kits be kept on site and readily available.

- Following the construction work, with operation of the wells, the Region’s Well Head Protection Policies should be implemented for this site, consistent with other Region wells.

3.3 Archaeological Assessment

In support of the original Class EA for the provision of additional water supply capacity for the Community of Cannington, the Region conducted Stage 2 Archaeological Assessment (AA) of the preferred site in 2011; which would house a new municipal well and pumphouse. As a result of this previous assessment, one Euro-Canadian site, the Burgess Site (BcGs-11), was discovered.

To further support the construction of the new well (PW 1/17), a Stage 3 AA was performed on a portion of the Burgess Site (BcGs-11) within the Region’s
property limits. In order to support the construction of a second potential well (PW 2/17), a Stage 2 AA was also undertaken for a small area southeast of the original 2011 Stage 2 AA. Both the Stage 2 and Stage 3 study areas are located within Part of Lot 18, Concession 12, in the Community of Cannington, Township of Brock, Regional Municipality of Durham. A copy of the Archaeological Assessment report is included in Appendix 3.

The Stage 2 AA of the second well site involved a test pit survey of a fallow and grassed area at five-metre intervals. No archaeological resources were encountered during the Stage 2 AA.

The Stage 3 AA of the Burgess Site (BcGs-11) commenced with the re-location of the site, followed by ploughing, discing and weathering. A datum at the site’s centre, as determined by the previous Stage 2 AA results, as well as the project limits, was established, and the controlled surface pick-up (CSP) commenced. This was followed by the excavation of 58 test-units. In total, 5,557 artifacts were collected from the CSP and test unit excavations. Potential cultural features were encountered within four test units.

The archival research and analysis of artifacts recovered at the Burgess Site indicate that this site witnessed at least three decades of domestic occupation by two generations of the Burgess family from ca. 1870 to the turn of the 20th century.

Per Section 3.4.2, Standard 1 of the 2011 Standards and Guidelines for Consultant Archaeologists (“2011 S&G”) published by the Ministry of Tourism, Culture and Sport (MTCS), owing to the complete post-1870 timeframe of the occupation, the Burgess Site (BcGs-11) is not considered to have significant cultural heritage value and does not require a Stage 4 mitigation of development impacts. Therefore, no further work is recommended for the site.

No construction activities shall take place within the study area prior to the Ministry of Tourism, Culture, and Sport (Archaeology Program Unit) confirming in writing that all archaeological licensing and technical review requirements have been satisfied.
### 3.4 Natural Environment Inventory and Impact Assessment

A Natural Sciences Report included in Appendix 4 was prepared as part of the Class EA Addendum to document the detailed review of natural inventories and analysis of environmental impacts in relation to the preferred alternative.

The study identified the eleven (11) potential species at risk (SAR) based on a screening review. The results of field surveys conducted in 2017 of the study area are summarized in Table 3.3 below.

**Table 3.3 – Species at Risk in Study Area**

<table>
<thead>
<tr>
<th>Species</th>
<th>Designation</th>
<th>Habitat</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butternut</td>
<td>Endangered</td>
<td>Rich, moist, and well-drained soils along streams or well-drained gravel site</td>
<td>Not observed in study area</td>
</tr>
<tr>
<td>Eastern Meadowlark</td>
<td>Endangered</td>
<td>Tallgrass prairies, open meadows, fallow agricultural fields, and hayfields</td>
<td>Not observed in study area</td>
</tr>
<tr>
<td>Bobolink</td>
<td>Endangered</td>
<td>Tallgrass prairies, open meadows, and fallow agricultural fields</td>
<td>Not observed in study area</td>
</tr>
<tr>
<td>Wood Thrush</td>
<td>Special Concern</td>
<td>Mature deciduous and mixed forests with tall trees</td>
<td>Not observed in study area</td>
</tr>
<tr>
<td>Eastern Wood-peewee</td>
<td>Special Concern</td>
<td>Edges of forests and intermediate ages forests</td>
<td>Not observed in study area</td>
</tr>
<tr>
<td>Chimney Swift</td>
<td>Threatened</td>
<td>Nests in old brick chimneys</td>
<td>Not observed.</td>
</tr>
<tr>
<td>Snapping Turtle</td>
<td>Special Concern</td>
<td>Variety of aquatic habitats, such as ponds, lakes, rivers, and streams</td>
<td>Not observed.</td>
</tr>
<tr>
<td>Eastern Small-footed Bat</td>
<td>Endangered</td>
<td>Overwintering habitat: Caves and mines Maternal Roosts: Caves, tree cavities, rock</td>
<td>Not observed in study area. However, these species have high potential to occur in adjacent forest communities</td>
</tr>
<tr>
<td>Species</td>
<td>Designation</td>
<td>Habitat</td>
<td>Results</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Little Brown Bat</td>
<td>Endangered</td>
<td>Overwintering habitat: Caves and mines that remain above 0</td>
<td>Not observed in study area. However, these species have high potential to occur in adjacent forest communities and may also occur in open grown trees or hedgerows</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maternal Roosts: Often associated with buildings (attics, barns etc.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Occasionally found in trees (25-44 cm dbh)</td>
<td></td>
</tr>
<tr>
<td>Northern Long Eared Bat</td>
<td>Endangered</td>
<td>Overwintering habitat: Caves and mines that remain above 0</td>
<td>Not observed in study area. However, these species have high potential to occur in adjacent forest communities and may also occur in open grown trees or hedgerows</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maternal Roosts: Often associated with cavities of large diameter trees</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(25-44 cm dbh) with cavities and crevices.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Occasionally found in structures (attics, barns etc.)</td>
<td></td>
</tr>
<tr>
<td>Tri-Colored Bat</td>
<td>Endangered</td>
<td>Overwintering habitat: Caves and mines above 0</td>
<td>Not observed in study area. However, these species have high potential to occur in adjacent forest communities and may also occur in open grown trees or hedgerows</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maternal Roosts: Often associated with clusters of dead leaves in large</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>diameter Oak or Maple trees</td>
<td></td>
</tr>
</tbody>
</table>

3.4.1 Potential Impacts

The activities required to implement the preferred alternative have the potential to impact terrestrial and aquatic habitat within and adjacent to the project site. Some of these impacts are short term, such as construction related impacts, while others may be more long term. It is anticipated that once mitigation measures are applied, the risk of impact to the natural environment is low.
Potential impacts that were identified in the Natural Sciences Report include:

- Loss of vegetation;
- Loss of tree resources;
- Disruption to birds during nesting season;
- Disruption to wildlife and wildlife habitat;
- Drop in baseflow to Beaver River;
- Decrease in wetland upwelling; and,
- Erosion and Sedimentation.

During the well testing discussed in Section 3.2 of the report, the water level in Beaver River was monitored at no impacts were observed. A similar monitoring program was implemented in the previous well testing in 2008. No further monitoring of the Beaver River is currently planned for the construction and operation of the permanent wells.

3.4.2 Mitigation

Construction impacts largely relate to the grading and removal of vegetation communities, active construction of new buildings, installation of slope protection measures, etc. Construction mitigation recommendations include but are not limited to:

- Minimizing the footprint of the construction and long-term footprint for the well and pumphouse as a first step to avoid impacts;
- Any vegetation removals must be in compliance with the Migratory Birds Convention Act (MBCA) including, but not limited to, adhering to timing restrictions during breeding season for tree pruning or removal during construction activities. The breeding bird season typically lasts from early April to late August for nest Zone C2;
- Any wildlife found within the construction zone should be removed by qualified individuals;
• Ensure that temporarily disturbed areas (including slopes) are adequately restored with native and non-invasive vegetation post-construction activities, and to protect trees to be retained;

• Ensure that construction activities are adequately contained with erosion and sediment control (ESC) measures and that sediment laden drainage is intercepted as close to the source as possible;

• Consistent with other similar construction projects, it is recommended that all construction storage, staging and refueling areas are located at least 30 meters away from any watercourse. (The closest watercourse is approximately 300 meters away from the site);

• Provide construction monitoring on site by an independent environmental monitor to ensure that erosion and sediment controls are working effectively, inspected regularly and maintained;

• In the event that dewatering is required, appropriate erosion and sediment controls should be employed, and pre-treatment for discharged water should be provided prior to release to aquatic habitat.

3.5 Geotechnical and Hydrogeological Investigations

Geotechnical and Hydrogeological Investigations were conducted in May 2017 on the preferred site and is included in Appendix 5. Six (6) boreholes were advanced at various locations throughout the site, to depths of approximately 6.6 meters below ground surface. Three (3) monitoring wells were also installed to monitor long-term groundwater conditions. The major recommendations from the report are as follows:

• Topsoil with thickness ranging from 125 mm to 255 mm was encountered surficially in all boreholes.

• Fill materials consisting of sand and sandy silt were encountered below the topsoil extending to depths ranging from about 0.7 m to 1.4 m below the existing ground surface.

• Sand, gravelly sand, sand and gravel and sandy gravel deposits were encountered below the topsoil or fill materials in all boreholes, and
extended to depths ranging from about 4.0 m to 6.6 m below the existing ground surface.

- Based on the results of this investigation, the existing fill materials are unsuitable to support the proposed building and any settlement sensitive structures. The proposed building may be founded on conventional shallow spread and/or continuous strip footings bearing in the native, undisturbed competent sand and gravel, sandy gravel, gravelly sand and sand.

- The existing topsoil and fill materials consisting of topsoil/organics may cause excessive settlement for floor slab and should be completely removed from the building footprint and be replaced with engineered fill. The topsoil and fill materials should be wasted or used for landscaping purposes.

- Based on the results of the investigation, the subsurface conditions consisted of predominant sandy/gravelly soils. Perched groundwater may be expected in the fill materials and shallow sandy/gravelly deposits above the groundwater tables at shallow depths, which can be controlled and removed by pumping from temporary sumps. Significant groundwater seepage should be expected should excavations extend into these deposits below the groundwater tables. Therefore, positive dewatering measures will be required to depressurize the groundwater levels to at least 1 m below the excavation base.

- Water taking of more than 400,000 L/day is subject to a Permit to Take Water (PTTW), while water taking of 50,000 L/day to 400,000 L/day is to be registered through the Environmental Activity and Sector Registry (EASR). The estimated construction dewatering rate is anticipated to be in the range of 50,000 L/day and 400,000 L/day. Therefore, a PTTW is not likely required, while an EASR registration should be processed for construction dewatering for the proposed pumphouse construction.
3.5.1 Soil Management

The Region is committed to adhering to the MECP’s guidelines for the Management of Excess Soil and the applicable regulations for the disposal of waste during construction.

The Geotechnical Report includes details of soil chemical analysis performed during the geotechnical investigation. A total of three (3) soil samples were analysed for metals and inorganics under Ontario Regulation 153/04 (“O. Reg. 153/04”) as amended. The soil analytical results were compared with the Ontario Ministry of the Environment, Conservation and Parks (“MECP”) “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, April 2011, Table 1: Full Depth Background Site Condition Standards for residential/Parkland/Institutional/Industrial/Commercial/Community Property Uses (“2011 MECP Table 1 Standards”); Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (“2011 MECP Table 2 Standards”), and Table 3: Full Depth Generic Site Condition Standards in a non-potable Ground Water Condition (“2011 MECP Table 3 Standards”). Based on the comparison, no exceedances of MECP Table 1, Table 2 or Table 3 standards were noted for metals and inorganics in the tested soil samples.

The construction area will have grading, including trenches and footing excavation that may result in soil surplus. The property is owned by the Region and has ample space to spread the surplus soil within the site. Therefore it is anticipated that the disposal of excess soil off-site would not be required. The grading details will be determined during detailed design stage.
4.0 Conclusions and Recommendations

Based on the findings in the preceding sections of this report, it has been determined that the assumptions used in the original Class EA to determine the preferred solution have largely remained unchanged and are still valid for the current planning context. All mitigation measures stated in section 6 of the 2011 ESR remain valid and will be undertaken.

The relevant recommendations that were documented in the ESR include:

- The preferred alternative is to provide additional well capacity through additional municipal well(s) to provide a capacity of 9.3 L/s.
- The Region is to proceed with the preliminary and detailed design of the new municipal well and remaining approvals.

The most significant change to the planning context, since the Class EA was completed in, is the implementation of the Clean Water Act (O.Reg. 287/07) in Ontario. This new regulation requires municipalities, through consultation with their local Source Water Protection Committees, to assess existing and potential threats to their drinking water, and subsequently implement measures to mitigate or eliminate such threats.

For the Class EA Addendum, the Lake Simcoe Region Conservation Authority (LSRCA) was consulted to review the applicable requirements under the Clean Water Act.

The proposed well site is located in an existing Wellhead Protection Area (WHPA), and the delineation of this area will need to be updated with the inclusion of the proposed Cannington wells. There are 21 water quality threats, as well as water quantity threats to consider when constructing new municipal wells. However, Cannington is not located within a WHPA-Q, and therefore water quantity threats are not present.

The Region will be updating the regional groundwater model with the inclusion of the Cannington wells, and the new WHPA delineations would be provided to LSRCA. LSCRA would then determine the water quality threats associated with the wells. This project has the potential to change/create new vulnerable areas.
The aforementioned technical work will be undertaken by the Region following the completion of the Class EA Addendum.

Furthermore, a new regulation (ERO 013-1840) under the Safe Drinking Water Act will come into effect on July 1, 2018, which will require the Region to coordinate the next update of the Source Protection Plan with LSRCA to identify and map new vulnerable areas. Based on this new regulation, the proposed Cannington wells cannot be placed into service until the new Source Protection Plan is updated.

4.1 30 Day Review Period

The next step in the Class EA Addendum process is to issue the Notice of Filing of Addendum, and allow for a 30-day review period for interested public, agencies, and First Nations to review and provide comments to this report.

Provided that no Part II Orders are requested, the project will proceed to preliminary and detailed design, obtaining approvals, and construction.

As of July 1, 2018, a Part II Order Request Form must be used to request a Part II Order. The Part II Order Request Form is available online on the Forms Repository website (https://www.forms.ssb.gov.on.ca/) by searching “Part II Order” or “012-2206E” (the form ID number).

4.2 Project Timeline

The following is a preliminary project schedule:

- Preliminary Design – end of 2018
- Detailed Design and Approvals – Spring / Summer 2019
- Construction Start – Fall 2019
- Construction Finish – Fall 2020

4.3 Approval Requirements

During the design phase of the project, various regulatory agencies having jurisdiction would be contacted to obtain the necessary approvals for construction. It is anticipated that the following approvals would be required:
- Source Protection Plan Update by the Lake Simcoe Region Conservation Authority (LSRCA)
- Drinking Water Works Permit (DWWP) Amendment from the Ministry of the Environment, Conservation and Parks (MECP)
- A ‘Category 3’ Permit to Take Water from the MECP
- Site Plan Approval and Building Permit from the Township of Brock
- Approval from the Ministry of Tourism, Culture and Sport (MTCS)
- Approval from the Electrical Safety Authority (ESA)
5.0 References
