

Executive Summary

Project Overview

The Region of Waterloo has embarked upon a Class Environmental Assessment for the New Dundee Water Supply System in the Community of New Dundee, in the Township of Wilmot. Due to anticipated changes to the Ontario Drinking Water Standards (ODWS) in terms of the manganese aesthetic objective, the New Dundee Wells were identified for potential treatment upgrades to meet the anticipated new standard.

The New Dundee community is currently supplied by two groundwater wells, located at 156 Alderview Drive, Wilmot. Raw water is pumped from these two wells at a combined maximum flow of 983,520 L/day, or 11.38 L/s, per the Permit to Take Water (PTTW) dated January 28, 2019. The facility consists of two treatment trains and four reservoir cells, with sodium hypochlorite injection for primary and secondary disinfection, and two high lift pumps that discharge water to the distribution system.

This project is a Schedule 'C' Municipal Class Environmental Assessment (Class EA) as it involves major expansions to the existing facilities. As part of the Schedule C Class EA, a list of alternative treatment and residual management solutions were reviewed and evaluated. Once the preferred treatment and residual management solutions were selected, several alternative location design concepts were developed and evaluated for the purposes of future property acquisition by the Region.

Evaluation Methodology

To evaluate the alternative solutions and alternative design concepts, four categories were proposed for the evaluation: Technical, Natural Environmental, Social, and Financial (25% weighting each). A sensitivity analysis was also applied to these weightings for evaluation purposes. The highest scoring solution or design in the natural environmental, social, and financial categories represents a lesser impact or cost. Under the technical category, the highest scoring solution represents better performance.

Each of the primary categories was further subdivided into specific criteria that were used to inform its overall score, with each individual criterion equally weighted.

Development and Evaluation of Alternative Solutions

To reduce the manganese concentrations in the New Dundee Water Supply System to meet the anticipated ODWS objectives, a long list of iron and manganese treatment technologies were identified and reviewed. The long list was then refined into a short list of two alternatives for detailed evaluation: Oxidation and Filtration, and Membrane Filtration. The short list of alternatives was then evaluated using the evaluation methodology described above. The preferred treatment alternative was determined to be oxidation using chlorine and filtration using either manganese dioxide coated media or manganese dioxide media. This alternative is a proven and effective technology with relatively small footprint, no additional chemicals, and lower costs and impacts compared with other alternatives.

Similar to the evaluation of treatment alternatives, a long list of residual management alternatives was developed and refined into a short list of two alternatives: Backwash Equalization Tank (BET) + Supernatant Recycle + Solid Hauling and BET and a New Sewage Pumping Station. The preferred residual management system will consist of a backwash equalization tank, recycling of the supernatant, and hauling of the residuals.

Sensitivity analyses were conducted where different weightings of the categories were evaluated to determine if the outcome of the different weightings would impact the selection of preferred alternatives. The preferred alternatives were not impacted by the variation in weighting.

Development and Evaluation of Alternative Design Concepts

Based on the preferred treatment and residual management approach, RVA worked with the Region to develop a conceptual building size. From public feedback through the consultation process, there were requests to reduce the footprint as much as possible. RVA and the Region conducted a water demand review and arrived at a 30% footprint reduction; the proposed building is estimated to be 15 m by 12 m. The total land area required for the building also included solids holding tank and driveway.

Five locations for the new iron and manganese facility were identified in the area surrounding the existing plant. These locations were identified based on considerations for land size available, vehicle access, distance to the existing New Dundee Water Supply System, environmental features, culture heritage features, areas of archeological potential, and current and potential future land uses.

A sensitivity analysis was performed on the evaluation of the location design concepts. The preferred location was not impacted by the variation in weighting.

Preferred Solution

To reduce the manganese concentrations in the New Dundee Water Supply System to meet the aesthetic objective of 0.02 mg/L, the preferred treatment solution was 'Alternative 5 – Oxidation and Filtration'. This solution consisted of conventional oxidation using chlorine and filtration using either manganese dioxide coated media or manganese dioxide media.

Following the selection of the preferred alternative treatment solution, the preferred residual management solution was determined to be 'Alternative E – Backwash Equalization Tank + Supernatant Recycle + Solids Hauling.'

Based on the preferred treatment and residual management solutions, a preliminary facility size and property size was determined. The preferred location was Location Alternative 2, which is to the immediate northwest of the existing facility at 156 Alderview Drive.

Public Consultation

Public consultation was completed as part of this Class EA process. There were multiple agencies, municipalities, stakeholder groups, and members of the public within 1 km of the existing well site that were invited to participate and comment on this study. Notice of Study Commencement was advertised in April 2020.

Subsequently, three public consultation centers (PCCs) were held virtually due to the Covid-19 pandemic:

- PCC #1 presented the information regarding the problem and opportunity statement.

- PCC #2 presented the information regarding the list of treatment and residual management alternative solutions and evaluation criteria. A short-list of possible location of a new facility to house the treatment equipment was also presented
- PCC #3 presented the information regarding the list of alternatives for locations and preferred design.

Notices for each PCC was informed through direct mail, email, local newspaper notices and Region website. For each PCC, PCC materials, including a narrated video, video transcript, slides, and comment sheet were available for review for 30 days. Indigenous communities were contacted and a record of consultation detailing all consultation efforts undertaken was prepared, in accordance with Ministry of the Environment, Conservation and Parks (MECP) requirements.

Mitigation Measures

Measures were proposed to mitigate impacts to the community and the natural environment to be considered during design and implemented in construction:

- During design, consideration should be made for:
 - disruption to species at risk and their habitat
 - climate change
 - holding a public consultation meeting
 - retaining a landscape architect to design the new site landscaping
- Measures to be considered for construction including:
 - minimizing noise, dust, vibration, and traffic
 - minimizing ground and surface water contaminations.
- The new facility should be given an architectural façade that allows it to blend in with the surrounding farmscape and rural countryside, as recommended from the Cultural Heritage reporting done on the site.

Next Steps and Schedule

Following the publishing of this Environmental Study Report (ESR) for the 30-day review period, if there are no comments, the next phase of this project will be to proceed with the property acquisition, detailed design, approvals, and construction of the preferred alternatives.