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The Regional Municipality of Durham Report

To:	Works Committee
From:	Commissioner of Works
Report:	#2025-W-7
Date:	April 2, 2025

Subject:

Sole Source Procurement of Engineering Services for the Implementation of the Ephyra® Technology and Post Implementation Support for Digester #2 at the Courtice Water Pollution Control Plant in the Municipality of Clarington

Recommendations:

That the Works Committee recommends to Regional Council:

- A) That staff be authorized to enter into a sole source agreement with CIMA+ Canada Inc. for engineering services for the design and construction of the Ephyra® technology as part of the proposed upgrade of Digester #2 at Courtice Water Pollution Control Plant, with an upset limit of \$2,150,000*, to be financed from within the approved project budget;
- B) That staff be authorized to enter into a sole source agreement with Royal Haskoning DHV to provide operational and process optimization support following the commissioning of the Ephyra® technology, for a period of five years, at an upset limit of \$850,000, to be financed from the approved operating budget; and
- C) That the Commissioner of Finance or designate be authorized to execute the necessary documents related to the sole source agreements.

Report:

1. Purpose

- 1.1 The purpose of this report is to obtain Regional Municipality of Durham (Region) Council approval to award sole source contracts to CIMA+ Canada Inc. for engineering services for the detailed design and construction of the Ephyra® technology and for operational and process optimization support from Royal Haskoning DHV for the upgrade of Digester #2 at the Courtice Water Pollution Control Plant (WPCP), in the Municipality of Clarington.
- 1.2 CIMA+ Canada Inc. (CIMA+) was retained through a competitive bid process (Request for Proposal (RFP) #1036-2022) to provide preliminary and detailed design consulting services for the upgrade of Digester #2 at the Courtice WPCP. CIMA+ will engage Royal Haskoning DHV as a subconsultant for the design and implementation of their technology for the project.
- 1.3 The Region will also establish a new agreement directly with Royal Haskoning DHV for operational and process optimization support for a five-year period, following the implementation of Ephyra® technology at the Courtice WPCP Digester #2.
- 1.4 Dollar amounts followed by an asterisk (*) are before applicable taxes.

2. Background

- 2.1 The Courtice WPCP was completed in 2008 and has a rated capacity of 68 million Litres per Day (MLD).
- 2.2 The Courtice WPCP utilizes a conventional activated sludge process with disinfection to treat raw sewage and discharges treated effluent to Lake Ontario.
- 2.3 Average day flow to the Courtice WPCP is approximately 65 per cent of its rated capacity. A Class Environmental Assessment (EA) is forecasted to commence in 2025 for the expansion of the plant.
- 2.4 The Courtice WPCP has two primary anaerobic digesters, Digester #1 and Digester #2. The cleaning of Digester #2 in 2018 revealed significant grit build up, and as well, the gas proofing membrane inside the digester had bubbled and delaminated in various locations.

- 2.5 The preliminary design for upgrade to Digester #2 at the Courtice WPCP is underway.
- 2.6 CIMA+ completed a capacity review of the digesters in 2024. The capacity review identified the following:
 - a. As plant flows increase towards the rated capacity with growth, Ministry of the Environment, Conservation and Parks' (MECP) guidelines will not be met without both digesters in operation.
 - b. The plant is currently operating at the lower end of the desired performance range.
- 2.7 Digesters are typically taken offline for an extended period. For example, Digester #2 has been offline for several years due to the deficiencies. As part of the preliminary design, CIMA+ recommended reviewing alternatives for increasing digester capacity.
- 2.8 Several options for increasing digester capacity were reviewed including constructing a third digester or implementing Ephyra® technology.
- 2.9 Ephyra® is a proprietary technology owned by Royal Haskoning DHV.
- 2.10 Ephyra® technology increases digestion capacity by controlling the three stages of digestion through isolated zones and optimizes performance.
- 2.11 Ephyra® technology has been implemented in several wastewater treatment plants (WWTP) around the world. The first installation was at Tollebeek Wastewater Treatment Plant in the province of Fevoland, in the Netherlands. The installation was completed in 2017 and has been in operation for eight years.
- 2.12 Ephyra® technology was piloted at the Waterloo Water and Wastewater Treatment Plant (WWTP) in 2021-2023 through a partnership between Ontario Clean Water Agency (OCWA) and Royal Haskoning DHV. The Region of Waterloo, University of Waterloo, MECP and Partners-for Water were amongst the stakeholders of the pilot test. Region staff visited the pilot site and had the opportunity to discuss the design, construction, operation and performance matters with operators, other municipal representatives, and the vendor.

- 2.13 The objectives of the Ephyra® technology pilot test were as follows:
 - a. Validation and approval of the Ephyra® technology by the relevant authorities for full-scale application in Ontario.
 - b. Operating Ephyra® under different Canadian (climate) conditions with different types of Canadian sludges.
 - c. Demonstrating the added value of Ephyra® for WWTPs in Ontario.
 - d. Showing sustainability and resource recovery potentials, enabling the further stimulation of the circular economy.
 - e. Positioning Ephyra® as a state-of-the-art, best-in-class anaerobic technology for digestion on municipal sludge.
 - f. Disseminate third-party validated pilot results (by the University of Waterloo) throughout Ontario and Canada.
- 2.14 Results from the Ephyra® technology pilot test are as follows:
 - a. Accepted by MECP as a valid and approved technology in Ontario.
 - b. Demonstrated stable operation during four seasons in Southern Ontario.
 - c. Demonstrated stable operations with different Canadian sludge compositions.
 - d. Demonstrated capacity can double in an existing digester.
- 2.15 Implementation of Ephyra® technology was selected as the preferred option for increasing digester capacity at the Courtice WPCP.

3. Previous Reports and Decisions

3.1 There are no previous reports and decisions.

4. Justification for Sole Source

- 4.1 The following summary provides a justification for a sole source:
 - a. Implementation of Ephyra® increases digester capacity to operate within MECP guidelines including when one digester is down for maintenance or refurbishment.
 - b. Increases biogas production which is a renewable resource the Region can utilize for revenue generation or heating at the plant.

- c. Reduces greenhouse gas emissions through increased digestion and methane capture. This is in line with the Region's greenhouse gas reduction strategy.
- d. Allows for phased implementation to ensure MECP's approval and optimized efficiency and control costs during implementation. Only Digester #2 will incorporate Ephyra® as part of the current project. The Region will explore implementation of the same technology in Digester #1 once Digester #2 performance data is analyzed.
- e. The most cost-effective solution for increasing digester capacity, according to CIMA+'s assessment, offers savings of over \$6.5 million compared to building another digester.
- f. Increases digester capacity to accommodate future expansion. Future expansion will require separate Waste Activated Sludge (WAS) thickening to take advantage of increased digester capacity. This will also reduce future trucking costs and emissions (recommended to be further investigated during the upcoming Class EA).
- g. Ephyra® is the only technology piloted in Ontario and Canada, reviewed by the MECP, that increases digester capacity without pretreatment of sludge.
- h. There are no other technologies that perform the same as Ephyra® to increase digester capacity. If new technologies were developed or introduced, it would take approximately three years to be validated by the MECP.
- i. Implementing Ephyra® allows the project to proceed within its current approved schedule and minimizes impacts on operations at the Courtice WPCP.

5. Financial Implications

5.1 Section 7.2 of the Region's Purchasing By-Law #16-2020 permits the acquisition of goods and services through sole source negotiations under specific circumstances outlined in Appendix 'C'. Section 1.1 of Appendix 'C' permits negotiations for goods or services to be supplied only by a particular supplier if no reasonable alternative or substitute goods exist due to the absence of competition for technical reasons. The By-law also requires Regional Council approval for any negotiated purchases of \$100,000 and greater in value.

- 5.2 It is recommended that staff be authorized to enter into a sole source agreement for the procurement of the Ephyra® technology as part of the proposed upgrade of Digester #2 at Courtice Water Pollution Control Plant, with an upset limit of \$2,150,000* and for post implementation operation and process optimization support with Royal Haskoning DHV for a period of five years with an upset limit of \$850,000*.
- 5.3 Financing for the implementation and licensing of Ephyra® technology will be provided from within the approved project budget for the Remediation at the Courtice WPCP (Project ID: D1920).

6. Relationship to Strategic Plan

- 6.1 This report aligns with the following strategic direction and pathways in the Durham Region's 2025 Strategic plan:
 - a. Connected and Vibrant Communities
 - C1: Align Regional infrastructure and asset management with projected growth, climate impacts, and community needs.
 - b. Environmental Sustainability and Climate Action
 - E1: Reduce corporate greenhouse gas emissions to meet established targets.

7. Conclusion

- 7.1 It is recommended that staff be authorized to award a sole source engineering services agreement to CIMA+ Canada Inc. for the detailed design and construction of the Ephyra® technology, with an upset limit not to exceed \$2,150,000 and to Royal Haskoning DHV for post implementation operational and optimization support for five years, at an upset limit not to exceed \$850,000 for use in Digester #2 as part of the Remediation at the Courtice Water Pollution Control Plant (Project ID: D1920).
- 7.2 This Report has been reviewed by the Finance Department, and the Commissioner of Finance concurs with the financial recommendations.

7.3 For additional information, contact: Sorin Manta, Manager, Engineering Support, at 905-668-4113 extension 3840.

Respectfully submitted,

Original signed by:

Ramesh Jagannathan, MBA, M.Eng., P.Eng., PTOE Commissioner of Works

Recommended for Presentation to Committee

Original signed by:

Elaine C. Baxter-Trahair Chief Administrative Officer