

The Regional Municipality of York

Committee of the Whole
Environmental Services
November 7, 2019

Report of the Commissioner of Environmental Services

Engineering Consulting Services for Digester Upgrades at Duffin Creek Plant

1. Recommendations

It is recommended that:

1. Council approve the award of engineering consulting services for pre-design, detailed design, contract administration and site inspection for digester upgrades at Duffin Creek Plant to CH2M Hill Canada Limited, pursuant to Request for Proposal P-19-46 at a total cost of \$2,845,340.00, excluding HST, and authorize execution of the contract on behalf of York Region.
2. The Commissioner of Environmental Services be authorized to execute the contract on behalf of the Region.

2. Summary

This report seeks Council authorization to retain engineering consulting services for pre-design, detailed design, contract administration, and site inspection for digester upgrades at Duffin Creek Plant.

The Region's Purchasing Bylaw requires Council authorization to award Requests for Proposal over \$2,000,000.

Key Points:

- The digestion process at Duffin Creek Plant is comprised of Complexes 1 and 2, which have been in service since 1980 and 1990, respectively, and are in need of refurbishment and upgrading
- Design and construction activities are scheduled and budgeted through to final commissioning of the digester complexes in 2024
- An open-call Request for Proposal was issued to provide engineering consulting services for pre-design, detailed design, contract administration, and site inspection at Duffin Creek Plant

- CH2M Hill Canada Limited submitted the highest overall score proposal at \$2,845,340.00 and it is recommended that Council award the contract to this proponent

3. Background

Digestion process upgrades are a key component of the asset management program at Duffin Creek Plant

Duffin Creek Plant processes wastewater generated in both York and Durham Regions as part of the York Durham Sewage System. Duffin Creek Plant became operational in 1977 and, in 1997, was assumed from the province by The Regional Municipality of York and The Regional Municipality of Durham (the Regions).

The digestion process at Duffin Creek Plant takes part in Complexes 1 and 2, which have been in service since 1980 and 1990, respectively. Each complex consists of four above-ground concrete tanks (36 metres in diameter and 11 metres tall), including two primary digesters, a secondary digester and a sludge blend tank. The digestion process contains multiple sub-processes that operate within harsh environments and facilitate the reduction and conversion of biological matter within sewage sludge into energy in the form of heat, steam and digester gas. Major components of the subsystems include mixers supported by the digester tank steel roofs, gas collection and utilization systems, gas burners and associated steam and heat exchanger equipment, together with major electrical infrastructure.

The digestion process is a key step in the treatment of wastewater solids (biosolids) generated as part of the wastewater treatment process. The plant provides operational redundancy and resiliency within the biosolids treatment process. It is integral to ensuring existing process capacity for forecasted growth to 2031 and beyond within both Regions.

Required upgrades to Duffin Creek Plant Digester Complexes 1 and 2 including the mixing process, electrical infrastructure, building envelope and other miscellaneous facilities were identified through asset management planning involving condition assessment and conceptual design work. The scope of work captured within Request for Proposal P-19-46 is scheduled for construction and final commissioning through 2024 and includes pre-design, detailed design and administration of the construction contract(s) including site inspection services, as required to upgrade the plant.

Digester mixing upgrades result in Duffin Creek Plant energy benefits

The digestion process is a significant consumer and generator of energy at Duffin Creek Plant. Sludge digestion produces energy in the form of biogas and consumes energy in the form of heat and electricity. The digestion process is highly dependent upon effective mixing, to achieve optimum process performance. Previously completed conceptual design work identified that upgrading the mixing system to the latest technology, such as linear motion mixing, will generate an approximate 70% reduction in electricity demand by the mixing

process. This should result in significant savings compared to the approximate \$235,000 current annual mixing system electricity cost. In addition, improved process performance within the sludge digestion process will increase biogas generation that is used to heat the plant facilities including the digesters. Improved digester performance and biogas production also supports the viability of gas injection to the grid which is currently being investigated.

4. Analysis

Request for Proposal P-19-46 was issued in Q3 2019 for open public procurement

Request for Proposal P-19-46 for pre-design, detailed design, contract administration and site inspection services for digester upgrades at Duffin Creek Plant was published for open public procurement on August 27, 2019. The Request for Proposal was advertised through Biddingo.com and the Region's Bids and Tenders notification system.

Request for Proposal P-19-46 detailed the scope of work required, which included the following services:

- Detailed inspection and assessment of digester roofs and the digester complex facility to support development of the detailed scope of upgrades and pre-design
- Design for replacement of the digester mixer technology that currently uses a propeller style mixer with a more efficient mixing technology that uses large oscillating discs referred to as linear motion mixers to improve process performance and maintenance demand
- Design for major electrical replacements and upgrades to address obsolescence and to provide needed redundancy for the digester facility to ensure reliability of service
- Construction contract administration and site inspection services

Request for Proposal P-19-46 closed on October 8, 2019. Of the 14 proponents that obtained the Request for Proposal, four submitted proposals and two compliant proposals were received.

Proposals were evaluated using the two-envelope system

Proposals were evaluated using the two-envelope system with technical and financial information submitted in separate envelopes. The overall proposal score was evaluated based on a weighting of 80 points for the technical proposal and 20 points for the financial proposal. Technical proposals were evaluated prior to any knowledge of financial information.

The Region's proposal evaluation team reviewed technical proposals based on criteria listed in Request for Proposal P-19-46 that included:

- Corporate and team experience

- Demonstration of project understanding
- Comprehensiveness of the approach to delivering the scope of work

Technical components of the proposal must achieve a minimum technical score of 60% (48 points out of the potential 80 points) to have the financial portion of the proposal considered. If a proponent does not achieve this minimum technical score, its financial proposal is returned unopened. Technical and financial results are summarized in Table 1.

Table 1
P-19-46 Consultant Proposal Evaluation Summary

Proponent	Technical Score (out of 80)	Total Fee (\$) (excluding HST)	Financial Score (out of 20)	Total Score (out of 100)
CH2M Hill Canada Limited	70.0	2,845,340.00	20.0	90.0
Associated Engineering (Ont.) Ltd.	59.5	3,215,030.05	17.7	77.2
Green PI Inc.	*n/a	n/a	n/a	n/a
WSP Canada Group Ltd.	**n/a	n/a	n/a	n/a

* Proponent did not achieve the minimum technical score of at least 48 out of 80 (or 60%)

**Proponent's proposal was deemed non-compliant due to the inclusion of financial information in its technical submission

Evaluation of proposals revealed that CH2M Hill Canada Limited achieved the highest ranked proposal

Evaluation of proposals revealed that CH2M Hill Canada Limited achieved the highest overall score and is therefore recommended for this assignment. Had any of the other bidders achieved an overall score within five points of CH2M Hill Canada Limited's overall score, a dollar cost per technical point methodology would have been applied to determine the winning bid. In this case, the next highest overall score was not within the required five points.

The proposal submitted by CH2M Hill Canada Limited demonstrated a clear understanding of project requirements and provided an experienced team committed to working with Regional staff. The proposal submitted by CH2M Hill Canada Limited represents the best value for the Region.

Green PI Inc.’s technical proposal did not achieve the minimum score of 60%. Therefore, the financial proposal was not opened. The technical proposal submitted by Green PI Inc. did not demonstrate required understanding of the project scope. Green PI Inc. proposed approximately 80% fewer hours compared to other proponents. The project team proposed by Green PI Inc. did not meet the experience requirement listed in the Request for Proposal P-19-46 document and the company has no relevant experience working on large complex wastewater treatment processes. WSP Canada Group Ltd.’s technical proposal contained financial information, resulting in it being deemed non-compliant. Consequently, the submission by WSP Canada Group Ltd. was not evaluated.

The Procurement Office reviewed the evaluation summary and issued its report confirming that CH2M Hill Canada Limited be recommended as the successful overall proponent to undertake pre-design, detailed design, contract administration and site inspection services for digester upgrades of Complexes 1 and 2 at Duffin Creek Plant.

Digester upgrades support the Region’s Strategic Plan

This project aligns with the Region’s *2019 to 2023 Strategic Plan: Vision to Results* objective of ensuring reliable, responsive, effective, efficient and fiscally responsible service delivery. The project also aligns with the objective of managing the Region’s assets for current and future generations.

5. Financial

There is adequate Capital Spending Authority for this engineering assignment and estimated construction costs within the Environmental Services 10 Year Capital Plan (2019-2029). Preliminary construction cost estimates will be further refined as the project progresses through the detailed design stage. Any required adjustments to the Capital Spending Authority or budget will be brought forward as part of the annual approval process for future capital budgets. Table 2 details the estimated cost of the project.

Table 2
Estimated Cost of Digester Upgrades Project

Description	Cost/Estimate	York Region Share*	Durham Region Share*
Engineering (Current Request)			
Consultant Services	\$2,845,340	\$2,134,005	\$711,335
Construction (Estimated Future Costs)			
Construction Contracts	\$23,000,000	\$17,250,000	\$5,750,000
Total	\$25,845,340	\$19,384,005	\$6,461,335

*Approximate Funding Split: 75% York Region, 25% Durham Region

The project is rate funded and associated costs were included in asset management requirements of the Council-approved Rate Model and are accounted for in the 10 Year Capital Plan. Twenty-five per cent of total actual costs will be recovered from Durham Region as part of the existing Duffin Creek Plant joint ownership agreement between York and Durham Regions.

6. Local Impact

Duffin Creek Plant digestion complex receives wastewater solids generated at Regional treatment facilities located in York and Durham Regions and from private wastewater haulage companies.

Comprehensive upgrades to the digester mixers, electrical systems and miscellaneous aspects of Digester Complexes 1 and 2 will ensure the wastewater solids digestion process at Duffin Creek Plant meets process expectations through the forecasted growth period to 2031 and beyond. It will also ensure that digester gas production is enhanced and consistent, complementing digester gas utilization and commodification at Duffin Creek Plant into the future.

7. Conclusion

Four proposals from consulting firms were received and evaluated for the provision of engineering consulting services for digester upgrades at Duffin Creek Plant in accordance with the Region's Purchasing Bylaw. CH2M Hill Canada Limited submitted a proposal demonstrating they have the experience and qualifications to design and deliver digester upgrades within an operating plant and at a competitive price.

It is recommended that CH2M Hill Canada Limited be engaged to complete engineering consulting services for pre-design, detailed design, contract administration and site inspection for digester upgrades at Duffin Creek Plant at a fee of \$2,845,340.00, excluding HST.

For more information on this report, please contact Mike Rabeau, Director, Capital Planning and Delivery at 1-877-464-9675 ext. 75157. Accessible formats or communication supports are available upon request.

Recommended by: **Erin Mahoney, M. Eng.**
Commissioner of Environmental Services

Approved for Submission: **Bruce Macgregor**
Chief Administrative Officer

October 24, 2019
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