

Organics Processing Facilities Update

Date: March 13, 2024

To: Infrastructure and Environment Committee

From: General Manager, Solid Waste Management Services

Wards: All

REASON FOR CONFIDENTIAL INFORMATION

The attachment to this report is about a position, plan, procedure, criteria or instruction to be applied to any negotiations carried on or to be carried on by or on behalf of the City of Toronto.

SUMMARY

The City's Green Bin program helps to keep waste out of landfill by collecting and processing organics from approximately 460,000 houses and more than half of apartment and condominium buildings as well as schools and City-owned buildings. The City of Toronto (City) owns and operates two anaerobic digestion organic processing facilities: the Disco Road Organics Processing Facility (Disco OPF) and the Dufferin Organics Processing Facility (Dufferin OPF). The Disco OPF is designed to process 75,000 tonnes of organics per year and the Dufferin OPF is designed to process 55,000 tonnes of organics per year, for a combined City-owned processing capacity of 130,000 tonnes per year. Solid Waste Management Services (SWMS) is currently collecting between 160,000 and 170,000 tonnes of organics per year and utilizing third-party contractors to process the excess organic waste.

With limited regional organics processing capacity and the need to plan for the growth of Toronto, SWMS identified increased organics processing capacity as a priority and accelerated the planning of a third organics processing facility (construction in 2026 – versus 2036). This initiative was approved by City Council and included within the capital budget.

As part of the planning work for a third facility, various studies were undertaken and it was determined that expanding the existing Disco OPF would be the most cost-effective way to increase the City's organics processing capacity versus building a new facility. Expansion of the Disco OPF would take advantage of existing infrastructure and known

technology, reducing both risk and costs of the project. The expansion will allow the City to increase its organics processing capacity at the Disco OPF from 75,000 tonnes per year up to 140,000 tonnes per year.

The purpose of this report is to seek authorities to expedite the expansion of the Disco OPF and enhance performance at the Dufferin OPF.

RECOMMENDATIONS

The General Manager, Solid Waste Management Services recommends that:

1. City Council grant authority to the General Manager, Solid Waste Management Services to amend Purchase Order No. 6052895 with GHD Limited (GHD) awarded through Request for Proposal No. Doc2659801647 to provide detailed design and construction oversight services to expand the Disco Road Organics Processing Facility (Disco OPF) based on the pricing information presented in the Confidential Attachment to the report.
2. City Council authorize the General Manager, Solid Waste Management Services and/or designate, to negotiate and enter into any new agreements, amendments of existing agreements or related documents - including on the basis of a non-competitive procurement under Municipal Code Chapter 195, Purchasing - necessary to operate, maintain and undertake capital improvements to continue to process organics at the Disco Road Organics Processing Facility, for a term up to an additional five (5) years, based on the pricing information presented in the Confidential Attachment to the report, on terms and conditions satisfactory to the General Manager, Solid Waste Management Services and in a form satisfactory to the City Solicitor.
3. City Council authorize the General Manager, Solid Waste Management Services, and/or designate, to negotiate and enter into any new agreements, amendments of existing agreements or related documents with CCI Bioenergy Inc. (CCI) to supply a BTA ® Waste Pulper, two (2) anaerobic digester equipment packages and required ancillary equipment to expand the processing capacity of the Disco Road Organics Processing Facility, based on the pricing information presented in the Confidential Attachment to the report, on terms and conditions satisfactory to the General Manager, Solid Waste Management Services and in a form satisfactory to the City Solicitor.
4. City Council authorize the General Manager, Solid Waste Management Services, and/or designate, to negotiate and enter into any new agreements, amendments of existing agreements or related documents with GHD Ltd. (GHD) to provide engineering design and contract administration services for improvements to the Dufferin Organics Processing Facility, based on the pricing information presented in the Confidential Attachment to the report on terms and conditions satisfactory to the General Manager, Solid Waste Management Services and in a form satisfactory to the City Solicitor.
5. City Council authorize the General Manager, Solid Waste Management Services and/or designate, to negotiate and enter into any new agreements, amendments of existing agreements or related documents - including on the basis of a non-competitive

procurement under Municipal Code Chapter 195, Purchasing - necessary to design and supply pre-processing equipment to continue to process source separated organics at the Dufferin Organics Processing Facility, based on the pricing information presented in the Confidential Attachment to the report, on terms and conditions satisfactory to the General Manager, Solid Waste Management Services and in a form satisfactory to the City Solicitor.

6. City Council authorize the General Manager, Solid Waste Management Services, and/or designate, to negotiate and enter into any new agreements, amendments of existing agreements, or related documents or acknowledgements - including on the basis of a non-competitive procurement under Municipal Code Chapter 195, Purchasing - necessary in connection with the efforts to design, supply, install and operate additional Renewable Natural Gas infrastructure with Enbridge Gas Inc. (EGI) at the Disco Road RNG facility with a term of fifteen (15) years from the date of total completion of construction estimated to be in Q4 2029, based on the pricing information presented in the Confidential Attachment to the report, on terms and conditions satisfactory to the General Manager, Solid Waste Management Services and, if necessary, the Executive Director, Corporate Real Estate Management, and in a form satisfactory to the City Solicitor.

7. City Council authorize the General Manager, Solid Waste Management Services and/or designate, to negotiate and enter into any new agreements, amendments of existing agreements, or acknowledgements - including on the basis of a non-competitive procurement under Municipal Code Chapter 195, Purchasing - necessary in connection with the efforts to produce, manage, market, distribute, use and sell Renewable Natural Gas and other environmental attributes associated with Renewable Natural Gas production, on terms and conditions satisfactory to the General Manager, Solid Waste Management Services and, if necessary, the Executive Director, Corporate Real Estate Management, and in a form satisfactory to the City Solicitor.

8. City Council direct that the Confidential Attachment to the report March 13, 2024 from the General Manager, Solid Waste Management Services, remain confidential in its entirety indefinitely, as it relates to a position, plan, procedure, criteria or instruction to be applied to any negotiations carried on or to be carried on by or on behalf of the City of Toronto.

FINANCIAL IMPACT

Financial impacts resulting from Recommendations 1, 2, 3, 4, 5 and 6 are outlined in the Confidential Attachment.

There are no immediate financial impacts that would result from Recommendation 7 and no financial impacts that would result from Recommendation 8.

The Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

At its meeting on November 24, 2021, the Bid Award Panel granted authority to award a contract to GHD Limited (GHD) for Professional Engineering and Consulting Services required for the Design, Build and Commissioning of a new Organics Processing Facility for a period of seven (7) years from date of award.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2021.BA165.1>

At its meeting on December 17 -18, 2019, City Council adopted Item EX11.3 entitled "2020 Rate Supported Budgets - Solid Waste Management Services and Recommended 2020 Solid Waste Rates". As part of the 2020 Rate Supported Budget process, SWMS identified development of a third anaerobic digester to process organic waste as priority, due to potential Provincial/Federal funding programs, maturation of multi-residential Green Bin Program and long-term contract opportunities to accept organic waste from private entities and other municipalities. City Council also authorized the Chief Financial Officer and Treasurer and the General Manager, Solid Waste Management Services and/or designate, to negotiate and enter into any new agreements, amendments of existing agreements or acknowledgements, including on the basis of a non-competitive procurement under Municipal Code Chapter 195 (Purchasing), necessary in connection with the efforts to produce, manage, market, distribute, use and sell Renewable Natural Gas and other environmental attributes associated with Renewable Natural Gas production on terms and conditions satisfactory to the General Manager, Solid Waste Management Services and each in a form satisfactory to the City Solicitor and the Executive Director, Corporate Real Estate Management.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.EX11.3>

At its meeting on June 18 and 19, 2019, City Council authorized the General Manager, Solid Waste Management Services and/or designate to negotiate and enter into any agreements necessary to operate, maintain, or undertake capital improvements to continue to process source separated organics at the Disco Road Organics Processing Facility, for terms up to 10 years at the sole discretion of the General Manager, Solid Waste Management Services based in part on the pricing information for operational costs adopted by City Council on July 23, 24, 25, 26, 27 and 30, 2018, on terms satisfactory to the General Manager, Solid Waste Management Services and the Chief Financial Officer and Treasurer and each in a form satisfactory to the City Solicitor.

The City Council Decision documents can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.IE.5.11>

At its meeting on July 4, 5, 6, and 7, 2017, City Council adopted item PE19.4 titled "TransformTO: Climate Action for a Healthy, Equitable and Prosperous Toronto - Report 2 - The Pathway to a Low Carbon Future" and directed the General Manager, Solid Waste Management Services in consultation with the Director, Environment and Energy

to review the viability of the proposed Zoo Share biogas organics waste to electricity project at the Toronto Zoo, assess opportunities for organics energy projects at the former Beare Road Landfill and to report back to the Public Works and Infrastructure Committee in the fourth quarter of 2017 as part of the "Next Steps for Developing a Third Anaerobic Digester" report.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.PE19.4>

At its meeting on December 13, and 14, 2016, City Council considered item EX20.23 titled "2017 Rate Supported Budgets - Solid Waste Management Services and Recommended 2017 Solid Waste Rates" and directed the General Manager, Solid Waste Management Services to report back to the Budget Committee in the second quarter of 2017, on the next steps for developing a third anaerobic digester to process organic waste, given the business case for planning and securing additional capacity with an earlier timeline due to potential Provincial/Federal funding programs, maturation of multi-residential Green Bin Program and long-term contract opportunities to accept organic waste from private entities and other municipalities.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2016.EX20.23>

At its meeting on July 12, 13, 14, and 15, 2016, City Council adopted Item PW14.2 entitled "Final Long Term Waste Management Strategy" and approved the Long-Term Waste Management Strategy, including recommended options and implementation plan, as presented in Attachment 1 to the report (June 2, 2016) from the General Manager, Solid Waste Management Services.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2016.PW14.2>

At its meeting on June 7, 8 and 9, 2016, City Council adopted Item PW13.8 entitled "Authority to Enter into Renewable Natural Gas Projects". City Council authorized the General Manager, Solid Waste Management Services, to enter into Renewable Natural Gas Projects and agreements on such terms that are satisfactory to the General Manager, Solid Waste Management Services, based on the environmental/business case presented in Attachment 1 to the report (April 29, 2016) from the General Manager, Solid Waste Management Services and in a form satisfactory to the City Solicitor and that the General Manager, Solid Waste Management Services be authorized to execute these projects up until December 31, 2021.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2016.PW13.8>

COMMENTS

Background

Disco Road Organics Processing Facility Expansion

On November 24, 2021, the Bid Award Panel granted authority to award Ariba Document Number 2659801647 to GHD Limited (GHD) for Professional Engineering and Consulting Services Required for the Design, Build and Commissioning of a New Organics Processing Facility for Solid Waste Management Services (New OPF Project).

Engineering Studies were completed by GHD to investigate facility design parameters and other project development considerations. This included a Candidate Site Study, an Organics Characterization and Tonnage Forecast Study, a Contract Format Assessment Study, a Biogas Utilization Study and a Pre-processing Technology Assessment Study.

The Candidate Site study recommends expansion of the Disco OPF as the best option to increase the City's organics processing capacity. Sites considered in the study included the Disco OPF, the Dufferin Waste Management Facility, the Ingram Transfer Station, the Beare Road Landfill and others. The recommendation considered the following criteria: available space, sensitive receptors, utilities and services, existing development plans, natural heritage elements, wetlands, floodplains, water bodies, operating and capital expenditures, carbon intensity of operations and other site-specific considerations.

The study concluded that the cost to expand the Disco OPF would be lower compared to expanding the Dufferin OPF and compared to the construction of a new facility at any of the reviewed locations. Expansion at the Disco OPF takes advantage of a well-functioning facility using known technology. Through the use of existing infrastructure, such as the weigh scales, tip floor, odour control system, digestate management system and residue management system, the expansion will reduce the overall costs and risks associated with the project. Other advantages include a smaller development footprint, the potential to realize better energy efficiency and economy of scale and a lower carbon intensity compared to other options. The expansion will allow the City to increase its organics processing capacity at the Disco OPF from 75,000 tonnes per year to up to 140,000 tonnes per year.

The Contract Format Assessment Study was completed by P1 Consulting Inc., a consulting firm specializing in procurement and facility management to determine the best strategy to successfully procure a contractor to build and operate a new organics processing facility. For expansion of the Disco OPF, the design-bid-build procurement approach (DBB) was recommended as the best procurement strategy. The DBB model is optimal for projects where the owner has an established, known design. It is a model widely used by the City and allows the City to utilize the established experience of GHD Ltd. (GHD) and CCI BioEnergy (CCI) to facilitate the design, which will significantly reduce the construction and operational risks of the expansion. This model also

mitigates cost escalation risk since the timeframe between the selection of the builder and construction is reduced compared to a design-build-operate-maintain (DBOM) procurement approach, which was used to procure the contractors to build the Disco OPF and expand the Dufferin OPF.

GHD has been awarded the work to complete the design of a new organics processing facility up to the 50 per cent design level. This level of design considered a DBOM procurement approach, whereby the final portion of the design is completed by the same contractor hired to execute the construction of the project. Since the DBB was recommended as the best procurement strategy, the design must be taken to 100 per cent prior to procuring a contractor. Staff are seeking an increase to GHD's scope of work to include detailed design up to 100 per cent design and subsequent construction oversight to ensure engineering specifications are met. This is an increase in GHD's scope of work, however, it does not increase the overall project cost as the design would have had to be completed at a later stage under the DBOM procurement model by another firm. If the 50 to 100 per cent design is awarded to another engineering consultant, it would introduce risk and inefficiencies and delay the schedule. Having the same consultant finish the work allows for continuity and accountability of the design engineer. It also allows for no delay in the project timeline as additional time to procure a new consultant and allow them to familiarize themselves with the details of the project would not be required.

Staff are planning to issue a public procurement through the DBB model in 2025 for the capital delivery of the project. The DBB approach will simplify the procurement process, shorten the procurement period and is anticipated to reduce project costs. A shortened procurement period will help to mitigate construction cost escalations, which have been an impediment to major infrastructure development in Canada over the last several years.

Further to expanding the capacity of the Disco OPF, the expansion project will include work to upgrade and/or renew facility infrastructure. This will include replacing residue compactors, adding a backup power system and modernizing the SCADA (supervisory control and data acquisition) system as was recommended through a recent technical study. The work to renew and/or upgrade infrastructure at the Disco OPF is required regardless of the expansion project and can be completed more efficiently by including it in the expansion work.

Operating Agreement for the Disco Road Organics Processing Facility

The Disco Road Organics Processing Facility was commissioned at the end of June 31, 2014. The site is operated under contract by Veolia Water Canada (Veolia) until June 30, 2029. The current operating contract includes a budget for completing major maintenance and small capital improvements, with City approval, over the term of the contract. Since commissioning, this facility has consistently processed 75,000 tonnes of organic waste per year.

It is estimated that an expansion of the Disco OPF could be completed in 2028, which is close to the end of Veolia's current operating term (June 30, 2029). Extending the operating term up to an additional 5 years would ensure that the Disco OPF maintains a

consistent and experienced operator while the facility is undergoing a major change. Transitioning to a new operator at such a pivotal time presents a risk to the Disco OPF expansion, since it will require an experienced operator to identify and resolve any potential issues related to integrating the expansion. The current operator is best positioned to ensure successful integration and operation of the expanded facility during the initial operating years. As Veolia has operated the Disco OPF since it was commissioned in 2014, no other operator has the facility-specific knowledge to be able to spot and troubleshoot issues related to the facility expansion. Further, the pre-processing technology used at the Disco OPF, BTA® Waste Pulpers, is not widely used in Canada and knowledge of their operation and maintenance will be limited among operators outside of Veolia.

It is expected that a contract extension will generate efficiencies to reduce operating costs during and post expansion through developing acceptable risk sharing and mitigation measures and by implementing a collaborative approach to the design of the expanded facility. If negotiations do not result in terms acceptable to the City, as described in the Confidential Attachment, the City will enter into a competitive procurement process toward the end of the current operating term to procure a new operator.

Schedule for the Disco Road Organics Processing Facility Expansion

Preliminary designs for the Disco OPF expansion are currently underway. Construction is expected to begin in 2026 and be completed in 2028 with operations beginning that same year.

Pre-Processing Technology for the Disco OPF

A Pre-Processing Technology Assessment Study was completed as part of the New OPF Project. Pre-processing is a necessary step to transform the organic waste, which is delivered in plastic bags and contains some inorganic material, into a pulp that is free of film plastic and other unsolicited material.

Three different pre-processing technologies were considered in the study: density separation (i.e., pulpers), hydraulic presses, and hammermills. The evaluation considered processing capacity, organics capture performance, pulp quality, average biogas and methane production, digestate quality and quantity, operation downtime, and performance reliability. The study recommends that density separation technology currently operating at the Disco OPF (i.e., the BTA® Waste Pulper) be used for the expansion. This pre-processing technology will match the existing technology currently installed, which has performed well and consistently since the Disco OPF was commissioned in 2014.

Installation of a different pre-processing technology at the Disco OPF would create operational difficulties and increased operational costs. The operators of the Disco OPF have extensive training and experience with maintaining and operating the current technology. The addition of a second pre-processing technology would add significant complexity to site operations and significantly increase training requirements and daily

operation, maintenance tasks and costs. Further, a second pre-processing technology would require an entirely new set of spare parts to be purchased and maintained at the facility. As a result, substantial efficiencies can be realized with the use of the same pre-processing technology.

Staff are seeking authority to negotiate and award a sole source purchase of a BTA® Waste pulper and associated ancillary equipment at an estimated cost detailed in the Confidential Attachment.

Disco OPF Renewable Natural Gas

The City, working with Enbridge Gas Inc. (EGI), is installing infrastructure at the Disco OPF that will allow it to upgrade the biogas created from processing organics into renewable natural gas (RNG). The facility is expected to be online by the end of Q2, 2024 and is estimated to produce up to 4.6 million cubic metres of RNG per year that will be used by the City to help fuel its vehicles and heat its buildings.

The Disco OPF expansion will yield additional volumes of biogas available for conversion to RNG. The current Disco RNG infrastructure will not be able to process the additional biogas produced by the expanded OPF facility and the gas would need to be flared. The expansion of the biogas upgrading system in parallel with expansion of the Disco OPF will allow additional biogas produced to be utilized upon commissioning. This would allow the City to realize the full value of the biogas produced and maximize the return on the City's investment in expanding organics processing capacity. The expansion of the biogas upgrading system and RNG injection system will be completed as part of a separate project. Staff are seeking the authority to negotiate and amend the existing agreement with EGI to execute the expansion of the biogas upgrading system and RNG injection system currently under construction.

EGI is the only provider for injection services and infrastructure as these services are regulated services under the Ontario Energy Board (OEB). Similar to the methodology used for the original installation, EGI will be responsible for all aspects of project delivery, integration of new infrastructure with original equipment, maintenance, operations over a 15-year term and ultimately gas transportation, distribution or storage, and facilitation of any end-use option. The end-use of the additional RNG from the expansion is yet to be determined. SWMS will evaluate the following options from an economic, environmental, and social lens:

- self-consumption, which aligns with the current strategy for RNG produced at the Dufferin OPF and Disco OPF
- sale to a third-party consumer to create a revenue stream which could be reinvested in green infrastructure projects.
- a hybrid of the two options listed above.

SWMS will also continue to collaborate with the City's Environment and Climate and Corporate Real Estate Management Divisions to establish the best recommended end-use option based on the City's progress towards its TransformTO goals, economic feasibility and the priorities of the City leading up to the completion and commissioning of the facility.

Dufferin OPF Improvements

Dufferin Organics Processing Facility Improvements

The expanded Dufferin Organics Processing Facility (Dufferin OPF) reached substantial performance on July 9, 2021, marking the start of a three-year Operate and Maintain contract set to expire this year. The procurement for a new operator is currently underway.

Since its commissioning, this facility has not been able to meet performance specifications as set out in the Design, Build, and Commissioning Contract. As a result, the City was provided with a letter of credit to compensate for the deficiency. The contractor was given the opportunity to make improvements to the facility and earn all or a portion of the letter of credit back subject to a final performance test of the facility. As the contractor did not advance improvements to the facility, the City will receive the letter of credit funds. In order to meet the City's desired performance specifications, improvements are required. The City will utilize funds from the letter of credit and capital budget to make improvements to the facility and resolve deficiencies. The project is anticipated to be completed using the DBB procurement approach. Improvements planning, design, tendering and construction can take place over the course of the next operating term, initiating in 2024.

Pre-processing Equipment

One aspect of the Dufferin OPF requiring improvement is the pre-processing of organics. The pre-processing technology currently installed at the Dufferin OPF is unable to meet the performance specifications set out in the operating agreement for the facility. With an improved pre-processing system, the Dufferin OPF will be able to recover a higher percentage of the organics processed at the facility and be able to produce a larger volume of biogas. It is also anticipated that the upgraded equipment will increase the processing capacity of the site.

Dufferin Renewable Natural Gas

The City has installed infrastructure at the Dufferin Solid Waste Management Facility that allows it to create renewable natural gas (RNG) from organics and inject it into the natural gas pipeline to help fuel City vehicles and heat City buildings. The City began utilizing the RNG produced at this facility in November of 2022.

While fully operational, the Dufferin RNG facility is not yet meeting the designed capacity for RNG production, due to the Dufferin OPF not being able to process organics at the rated capacity. The Dufferin RNG facility has the potential to produce approximately 3.3 million cubic metres of RNG per year. As of January 2024, SWMS has produced 1.1 million cubic metres of RNG and utilized 822,700 cubic metres in the natural gas grid to help power City vehicles and heat City facilities. The remaining RNG produced is currently being stored for future utilization. Expediting the work to improve the Dufferin OPF would allow the City to begin work immediately to increase organics processing capacity and in turn increase RNG production.

GHD has been involved with the Dufferin OPF since 2013, from preliminary design through operations and has established special knowledge, skills, expertise and experience with respect to the project. As a result, staff are recommending that GHD be awarded the scope of work to complete engineering studies, predesign, detailed design, procurement support, contract administration, testing and commissioning and post construction support for improvements to the Dufferin OPF. Working with GHD would allow the City to realize cost savings as they would be able to begin work immediately and avoid costs associated with another firm reviewing facility design drawings and philosophy, operating manuals, and current operating challenges. Additionally, an expedited resolution to the challenges the facility is experiencing will save on operational costs, increase the amount of organic waste diverted from landfill, and benefit the output of the Dufferin RNG Facility.

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SIGNATURE

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