



Enwave DLWC – Proposed Heat Exchanger Amendment to the Energy Transfer Agreement

Date: September 25, 2019
To: Infrastructure and Environment Committee
From: General Manager, Toronto Water
Wards: Spadina-Fort York & Toronto-Danforth

SUMMARY

This report requests authority for the General Manager, Toronto Water, to enter into negotiations with Enwave Energy Corporation (Enwave) to amend the Energy Transfer Agreement between the City and Enwave dated January 18, 2002, as previously amended (the "ETA"), and to execute the necessary amending agreement, to permit the installation and operation by Enwave at its expense of three additional heat exchangers to the Energy Transfer Loop (the "ETL") at the John Street Pumping Station (the "JSPS") as part of the Deep Lake Water Cooling ("DLWC") system. Enwave has approached Toronto Water with a proposal to add these additional heat exchangers to the ETL, which are larger in size and different in type, to the 36 heat exchangers (18 pairs) currently in use. In addition to requiring an amendment to the ETA, Enwave's proposal would also necessitate an amendment to the City's Drinking Water Works Permit (DWWP) which amendment would require approval from the Ministry of the Environment, Conservation and Parks (MECP).

Back in 2013, City Council authorized the General Manager, Toronto Water, to enter into without prejudice negotiations with Enwave regarding Enwave's then proposed expansion of the DLWC system, which negotiations are on-going. That large-scale DLWC expansion proposal, which has been modified over the years by Enwave, seeks to significantly increase the size of DLWC, based on a new raw water diversion system originating at Toronto Water's Island Water Treatment Plant (WTP) and terminating at the JSPS. Should Enwave's expanded DLWC system eventually be realized and, ultimately, approved by City Council, it is contemplated that the three additional heat exchangers would eventually be disconnected from the ETL, rolled into the expansion and utilized as part of the expanded DLWC system infrastructure for raw water. Until such time as that occurs, Enwave is prepared to assume full responsibility under the ETA for the maintenance cleaning of all 39 heat exchangers, including all costs. However, in the intervening period, if it is subsequently determined by either Enwave or Toronto Water that an expansion of the DLWC system is no longer viable, it is proposed that Enwave and the City will negotiate in good faith a mutually acceptable maintenance cost arrangement for the future continued cleaning of all 39 heat exchangers. If the parties cannot do so within six months, Enwave will, at its own expense, remove the Enwave DLWC Heat Exchanger Amendment to ETA

three additional heat exchangers and the ETA will be further amended to revert maintenance cleaning responsibility and costs back to the City for the original remaining 36 heat exchangers. This report also seeks authority for the General Manager, Toronto Water, to enter into and to execute that amending agreement, if necessary.

Enwave has represented to Toronto Water staff that the addition of these new heat exchangers would provide it with sustained cooling capacity and overall operational efficiencies without in any way adversely impacting the City's water supply, Toronto Water's operations and plant capacity, flows, or the DLWC system design as contemplated by the ETA. In exchange, because Enwave would assume responsibility for the maintenance cleaning of all 39 heat exchangers, including all costs, the City would receive the benefit of a reduction in Toronto Water's annual operating expenditures. In addition, due to the operation of the additional heat exchangers, it is expected that the City would receive a minor increase in the Energy Transfer Fee (ETF) revenue paid by Enwave to the City under the ETA.

RECOMMENDATIONS

The General Manager, Toronto Water recommends that:

1. City Council authorize the General Manager, Toronto Water, to negotiate, enter into and execute an amending agreement to the Energy Transfer Agreement between the City and Enwave dated January 18, 2002, as amended by the amending agreement dated August 20, 2007 and the second amending agreement dated September 1, 2010 (collectively, the "ETA"), to permit the installation and operation by Enwave of three additional heat exchangers, larger in size and different in type, to the Energy Transfer Loop (the "ETL") at the John Street Pumping Station (the "JSPS") as part of the Deep Lake Water Cooling ("DLWC") system on terms and conditions acceptable to the General Manager, Toronto Water, and in a form acceptable to the City Solicitor, subject to the following conditions:
 - a. that the three new heat exchangers, and any upgrades or appurtenances necessary to fully and effectively operate and incorporate them into the existing infrastructure or operating DLWC system (the "Works"), shall be at Enwave's sole expense;
 - b. without limiting Recommendation 1(a), that Enwave shall be solely responsible for the installation, commissioning, operation, maintenance, warranty and repair of the Works, at no cost to the City whatsoever;
 - c. that the Works shall meet the City's technical and operational requirements as determined by the General Manager, Toronto Water, in his sole discretion;
 - d. on the City (Toronto Water) obtaining an amendment to its Drinking Water Works Permit (DWWP), and any other necessary approval(s) from the Ministry of the Environment, Conservation and Parks (MECP), to permit the use and operation of the Works, all at Enwave's sole expense;

e. that Enwave assume full responsibility under the ETA for the maintenance cleaning of the 39 heat exchangers, including all costs, to which the ETA applies, or will apply upon this amendment, including those portions of the heat exchangers through which the City's water passes, until such time as the ETA may be further amended to reflect any DLWC expansion approved by City Council, and otherwise provides for and governs the maintenance responsibility to clean, and pay the cost of cleaning the heat exchangers; or it is determined by either Enwave or the City, upon written notice to the other, that the DLWC expansion is no longer viable; and,

f. if the DLWC expansion is determined to be no longer viable, Enwave and the City will negotiate in good faith a mutually acceptable maintenance cost arrangement for the future continued cleaning of all 39 heat exchangers and, if the parties fail to do so within six months from delivery of the written notice specified in Recommendation 1(e), Enwave shall, at its own expense, remove the three additional heat exchangers and the ETA will be further amended to revert maintenance cleaning responsibility and costs back to the City for the original remaining 36 heat exchangers. In this latter event, the General Manager, Toronto Water, is hereby authorized to negotiate, enter into and execute the necessary amending agreement to the ETA on terms and conditions acceptable to the General Manager, Toronto Water, and in a form acceptable to the City Solicitor.

FINANCIAL IMPACT

Under the ETA, Enwave pays the City an ETF for the cooling energy transferred through the ETL. It is estimated that the addition of the proposed three new heat exchangers would increase the revenue generated by the ETF by approximately \$3,000 annually. Also, as Enwave is responsible to reimburse the City for any increase in electricity consumption costs at the JSPS Extension, including any costs associated with the City water pumps feeding the additional heat exchangers, there will be no adverse financial impact to Toronto Water's energy costs by the operation of the three additional heat exchangers.

Toronto Water, however, expends considerable time and resources in the coordinated maintenance effort to clean the existing 36 heat exchangers (specifically, the portions of the heat exchangers through which City water passes). In 2019, cleaning operations cost Toronto Water \$123,542 (net of HST recoveries), including labour, subcontractors, and parts and material costs. The proposed ETA amendment would transfer that operating cost from Toronto Water to Enwave, for all 39 heat exchangers (36 existing, plus 3 new), representing annual operating savings or resources that can be reallocated to other operational requirements as reflected in the 2020 Operating Budget Submission for Toronto Water. Toronto Water would continue to support only heat exchanger isolation when requested by Enwave and as determined by the City (as only licenced operators are legislated to perform this function in relation to a municipal water supply system). This proposed heat exchanger cleaning cost arrangement would remain in place until either the ETA is further amended to reflect any DLWC expansion approved by City Council and any future negotiated and approved maintenance cost arrangement

regarding the cleaning of the heat exchangers, or, it is determined by either Enwave or the City, upon written notice to the other, that the DLWC expansion is no longer viable as described in this report.

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

DECISION HISTORY

At its meeting on June 11, 12 and 13, 2013, City Council adopted, without amendment, Item PW23.5 entitled "Enwave - Deep Lake Water Cooling System Expansion Proposal" thereby authorizing the General Manager, Toronto Water, in consultation with the Chief Corporate Officer and the City Solicitor, to enter into without prejudice contract negotiations with Enwave regarding Enwave's proposal to further amend the ETA to expand the DLWC system capacity by increasing the flow of cool water and to report back following the conclusion of negotiations to seek further Council direction.

The City Council decision can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2013.PW23.5>

COMMENTS

The ETA governs the relationship between the City and Enwave in relation to DLWC. It is a 50 year agreement. The ETA was first executed on January 18, 2002 and, subsequently amended on August 20, 2007 and September 1, 2010. Since 2013, as authorized by City Council, the parties have been negotiating, on a without prejudice basis, an expansion of the DLWC system proposed by Enwave, and since modified, with a view to significantly increasing the size of the DLWC system, based on a new raw water diversion system originating at the Island WTP and terminating at the JSPS. Those contract negotiations continue and once concluded staff will report back to Council for further direction. In the interim, Enwave has requested a further amendment to the ETA to permit the installation and operation by Enwave, at its expense, of three additional heat exchangers to the ETL at the JSPS as part of the DLWC system.

By its proposal to add the three new heat exchangers, Enwave's objective is to maximize and sustain cooling capacity to the extent possible. To further this end, Enwave seeks to add the three heat exchangers which it believes will help to sustain cooling capacity and overall operational efficiencies without in any way adversely impacting the City's water supply, Toronto Water's operations and plant capacity, flow or the DLWC system design as contemplated by the ETA. Based on its technical analysis, Enwave maintains that these three additional heat exchangers will allow the DLWC system to operate with more consistency and stability at high flows, particularly in the peak-demand summer months, while affording the operational flexibility Enwave desires to achieve and providing predictability to maintenance cycles.

Also, with sustained high capacity DLWC flows, more heat will be transferred to the City's drinking water within the ETL and, as such, the City can expect to realize minor additional revenue from Enwave by way of the ETF. It is estimated that, at a minimum, Enwave DLWC Heat Exchanger Amendment to ETA

an additional 250,000 ton-hours of energy will be added to the ETL annually, equating to approximately \$3,000 in additional ETF revenue to the City. In addition, as Enwave is responsible under the ETA for any associated increase in electricity consumption costs at the JSPS Extension, including from the operation of the City water pumps feeding the additional heat exchangers, there will be no adverse impact to the City's energy costs.

In exchange for the City's agreement to add the three new heat exchangers, Enwave is also prepared to assume the responsibility for the maintenance cleaning of all 39 heat exchangers, including all costs, with Toronto Water only supporting the heat exchanger isolation when requested by Enwave and as determined by the City. This maintenance approach would benefit Enwave as it will allow Enwave to schedule and execute the heat exchanger cleaning at its convenience. It is proposed that this financial arrangement of the maintenance cost transfer to Enwave remain in place until such time as the three new heat exchangers are permanently disconnected from the existing ETL and relocated to any new raw water DLWC infrastructure forming part of an expansion of DLWC approved by Council, if any. Thereafter, all future heat exchanger cleaning costs would be addressed by a future amendment to the ETA governing the expansion. Alternatively, if it is subsequently determined by either Enwave or the City, upon written notice to the other, that the DLWC expansion is no longer viable, then the parties would negotiate in good faith a mutually acceptable maintenance cost arrangement for the future continued cleaning of all 39 heat exchangers. If the parties fail to do so within six months of delivery of the written notice, Enwave will, at its sole expense, remove the three new heat exchangers and the ETA will be amended to revert the maintenance cleaning responsibility and costs back to the City for the original remaining 36 heat exchangers.

Any amendment to the ETA to add the new heat exchangers would need to ensure that the City's technical and operational requirements are met as determined by the General Manager, Toronto Water. Measures to ensure the safety and security of the City's water supply would be of paramount consideration for the General Manager, Toronto Water, in his determination of the terms and conditions required by the City. Of primary concern is the need to ensure that the pressure in the water lines on Enwave's side of the heat exchangers is always lower than the pressure in the City's water supply lines passing through the heat exchangers, and that the City is able to maintain the pressure on the City-side to the former approved design value.

By its nature, the proposed addition of the three new heat exchangers to the ETL requires an amendment to the City's DWWP as issued by the MECP and, therefore, is subject to MECP approval. Should Council adopt the recommendations in this report, Toronto Water will have to prepare and submit the appropriate application in order to obtain this approval from the Province.

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SIGNATURE

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