

Clause embodied in Report No. 12 of the Works Committee, as adopted by the Council of the City of Toronto at its meeting held on July 24, 25 and 26, 2001.

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Deep Lake Water Cooling Project Energy Transfer Agreement

(City Council on July 24, 25 and 26, 2001, adopted this Clause, without amendment.)

The Works Committee recommends:

- (1) the adoption of the report dated June 22, 2001 from the Commissioner of Works and Emergency Services; and**
- (2) that Enwave District Energy Limited be requested to report back to the Works Committee by October 2001 on the development of partners.**

The Works Committee reports, for the information of Council, having requested the Interim Chief Financial Officer, in consultation with the Chief Administrator's Office, to report directly to Council for its meeting on July 24, 2001, on any adjustments to the arrangements that might minimize the taxes payable, while ensuring the City's protection and control of its water supply.

The Works Committee submits the following report (June 22, 2001) from the Commissioner of Works and Emergency Services:

Purpose:

To provide an update on the status of the Deep Lake Water Cooling (DLWC) project, to obtain approval for the expansion of the John Street Pumping Station (JSPS) to facilitate the project, and to obtain authorization for City staff to execute an Energy Transfer Agreement (ETA) with Enwave District Energy Limited (Enwave).

Financial Implications and Impact Statement:

Under the ETA, a new intake for the Island Filtration Plant (IFP) estimated to cost \$50 million will be constructed and upgrades to the IFP and JSPS will be implemented at no cost to the City. In order to facilitate project implementation, a \$6 million expansion to the John Street Pumping Station is also required and will be provided at no cost to the City.

Additional operating costs incurred by the City to enable the utilization of potable water for cooling purposes will be covered by Enwave.

The City will receive revenue through an Energy Transfer Fee (ETF) based on the amount of cooling energy transferred.

The City, as owner, will bear the cost of property rights for the new intake to be obtained from the Ministry of Natural Resources.

Financial commitments by the City of Toronto to date have been a total of \$400,000, net of GST rebate, previously authorized by Council based on equal cost sharing with Enwave for a pre-design study for the DLWC project.

All other project costs including detailed design, construction and commissioning of project works will be borne solely by Enwave.

An in-kind contribution by the City in the form of built infrastructure is essential to enable the project.

Following execution of the ETA, the City will be committed to complete the planned winterization of the IFP at its cost. Funding in the amount of \$8,639,000 has been allocated in the approved 2001–2005 Capital Works Program to undertake this project between 2001 and 2003. Authorization for the expenditure of these funds for the IFP modifications will be obtained through a separate report to Works Committee.

The Chief Financial Officer has reviewed the financial implications as outlined in this report and is in concurrence.

Recommendations:

It is recommended that:

- (1) approval be granted for the expansion of the John Street Pumping Station as set out in this report, at Enwave's cost, to facilitate implementation of the Deep Lake Water Cooling project, subject to successful completion of the site plan approval process; and
- (2) the appropriate City of Toronto officials be authorized to execute an Energy Transfer Agreement with Enwave District Energy Limited on the terms and conditions set out in this report and on other terms and conditions satisfactory to the Commissioner of Works and Emergency Services and in a form satisfactory to the City Solicitor.

Background:

At its meeting of June 7, 8 and 9, 2000, City of Toronto Council approved a report from the Works Committee, which provided an update on the status of the DLWC project and recommended that authority be granted for an additional expenditure of up to \$200,000, net of GST rebate, to enable completion of the pre-design study.

The report contained an outline of the project's background and the various benefits that would be realized if the project were implemented.

The project entails the year-round supply of water at 4 degrees Celsius from an 85-metre depth in Lake Ontario through a new intake constructed for the IFP. Following treatment at the Island

Plant, the potable water would be transmitted to JSPS where a portion would be diverted through an energy transfer loop (ETL) to heat exchangers to be located in a facility constructed as an expansion to the JSPS. The water would then be returned to the discharge mains at JSPS at no more than 13.3 degrees Celsius for distribution to the City consumers. The chilled water would be distributed through Enwave's district cooling network to consumers in the downtown core.

The project has many benefits. If the project proceeds as proposed, Toronto Water Supply will obtain a new intake for the IFP and an expanded JSPS with two diesel generators for back-up power supply. As the intake will be located further offshore, it will provide an improved raw water source that may result in reduced taste and odour occurrences in water supplied from this plant.

The project will produce significant environmental benefits. Using deep lake water as a cooling source will reduce the demand for electricity and enable removal of ozone depleting refrigerants from existing building cooling systems. Based on the estimated peak cooling capacity of 40,000 tonnes, carbon dioxide emissions would be reduced by approximately 30,000 tonnes per year, along with reduction in nitrous oxides, sulphur dioxide and fine particle emissions. There would also be economic benefits to consumers to the extent that district cooling using deep lake water is less costly than conventional cooling using electric chillers.

A major contribution by the City towards enabling this unique undertaking is the long-term commitment of built infrastructure in the form of the IFP, the watermain and tunnel to JSPS and a major portion of the JSPS. On-going operations of this significant component of the Water Supply infrastructure would be dedicated for dual purposes; the core potable water supply and the lake water cooling functions.

Metropolitan Council at its meeting on September 24 and 25, 1997, authorized staff to execute an ETA with Toronto District Heating Corporation (now Enwave), and authorized an expenditure of \$200,000 after municipal GST rebate to proceed with a pre-design study and Class Environmental Assessment (EA). A further \$200,000 was subsequently approved by City of Toronto Council in June 2000 to enable completion of the work. The pre-design study was required to confirm overall project viability and fully assess the impacts of this project to ensure the work will not compromise the security or quality of the water supply. The EA was required under the Class Environmental Assessment Program for Municipal Water and Wastewater projects. The cost of the pre-design study and EA was agreed to be shared with Enwave. Given that the project will significantly benefit the City, Toronto Water Supply shared in the risk of the project until project viability was fully established through the pre-design phase.

The terms and conditions described in the September 1997 report were to form the basis of an ETA proposed to be executed following mutual agreement by Toronto Works and Emergency Services and Enwave to proceed with the project following completion of the pre-design study.

As indicated in the June 2000 report, Enwave became a corporation regulated under the Ontario Business Corporations Act in 1999. At its meeting of September 28 and 29, 1999, City Council approved a plan wherein City of Toronto and Ontario Municipal Employees Retirement System (OMERS) would become shareholders of Enwave. Subsequently, the City and Borealis Funds

Management Ltd. on behalf of OMERS executed a letter agreement dated December 1, 1999, (attached) setting out certain terms for the ETA.

Comments:

Subsequent to the June 2000 report, a number of key activities have been undertaken which have impacted the project implementation plan. These are as follows:

- (i) An EA revision process was completed in September 2000 to enable consideration of additional options for intake construction to that identified in the 1998 EA report (tunnel from Island Plant to a depth of 70 metres). The two options comprised a tunnel from the Island Plant via Leslie Street Spit and large diameter, high-density polyethylene (HDPE) pipe from the Island Plant, both to a depth of 85 metres.
- (ii) Additional information has been obtained to assess the quality of water and temperature variations from various locations and depths.
- (iii) Additional geotechnical work was undertaken to assess the feasibility of intake options.
- (iv) Further engineering analyses of intake sizes and routes and refinement of cost estimates have been completed.
- (v) On the basis of these activities, the option of three HDPE pipes in parallel was determined to be the only viable intake option for this project.
- (vi) An evaluation of various scenarios representing a potential risk to continuous supply of water for cooling purposes and identification of mitigative action and development of contingency plans required to address the scenarios were undertaken.

An essential requirement to enable supply to the Island community in a contingent supply scenario is the construction of a watermain linking the Island distribution system to the mainland network. This has been included as part of the Capital projects to be implemented at Enwave's cost.

- (vii) An assessment was undertaken of the feasibility of constructing a building on a parcel of City-owned lands south of the JSPS to house equipment for the DLWC project, previously planned for the Enwave facility at the Metro Toronto Convention Centre or an alternative location.

Following a review by City staff of the potential requirement for the 0.2 hectare parcel of land for future expansion of the pumping station, it was concluded that additional pumping capacity was not required within and likely beyond a 30-year planning horizon. On the basis of preliminary engineering, Enwave and City staff have concluded that the site would adequately accommodate a facility to house DLWC equipment including the ETL, heat exchangers, booster pumps and back-up power supply systems. Enwave is prepared to have the building expansion, estimated to cost \$6 million, designed and

constructed at their cost following approval by City staff with title to the building transferred to the City upon completion.

Toronto Water Supply would receive an additional benefit from this arrangement in that two diesel generators with sufficient capacity to power two JSPS pumping units in a power failure scenario would be provided in the facility at Enwave's cost.

Approval to proceed with the expansion of the JSPS, which is an integral component of the DLWC project, is now required, subject to successful completion of the site plan approval process which is in progress.

The pre-design study and supplementary reports to address specific project issues are now essentially complete. These reports, together with the outcomes of the aforementioned activities, have confirmed project viability from both the technical and financial perspectives and have ensured that the project will not compromise the quality or security of the water supply. These deliverables form the basis on which detailed design has been initiated and has progressed to the 25 percent completion stage, enabling refinement of the project schedule and cost estimates.

Enwave has advised that an executed agreement is required before committing the Capital expenditures required for project implementation. On the critical path is an initial commitment to purchase HDPE pipe by this summer in order to guarantee deliveries required to meet the project schedule.

Accordingly, execution of the ETA is required immediately following authorization by City Council to enable the project's timelines for completion by the end of 2003 to be achieved.

A target date of August 1, 2001, has been proposed by Enwave to finalize and execute the ETA. Achievement of this objective would require a significant time commitment in July from City staff in the Finance, Corporate Services and Works and Emergency Services Departments.

In parallel with the pre-engineering activities outlined, staff from the City and Enwave have had on-going discussions regarding the draft ETA culminating in agreement in principle on all issues.

The terms and conditions of the ETA as proposed in the September 1997 report to Council continue to be valid for the most part. Those terms that remain unchanged are listed as follows:

- I (a) The City, using budgeted funds, obtains approval for and winterizes the Island Plant at its expense;
- I (b) Enwave and the City shall obtain all other required external approvals at Enwave's cost as appropriate;
- I (c) Enwave, at its expense, provides upgrades to the JSPS to enable diversion of water through heat exchangers;

- I (d) The City shall be permitted to monitor and inspect the operation of the heat exchange facility and have access to the central cooling plant at the Metro Toronto Convention Centre;
- I (e) Enwave shall be permitted to monitor and inspect the new intake, the IFP upgrades and the JSPS upgrades;
- I (f) Maintaining the security, quality and purity of the City's water supply will remain paramount. There shall be no connection between the cooling loop and the City water lines. A multi-level system of protection of the water supply system shall be provided that meets or exceeds the level of protection provided in heat exchangers of a type used in the food and beverage industry for several decades. The pressure in the water lines shall always be higher than the pressure in the cooling lines;
- I (g) Enwave and the City shall be protected from Force Majeure;
- I (h) Indemnification of each party is provided by the other with respect to the party's own negligence;
- I (i) Any unresolved disputes shall be settled under the Arbitration Act of Ontario;
- I (j) The maximum water available to Enwave under the agreement is based on the approved capacity of the IFP; and
- I (k) The City and Enwave agree to keep commercial information confidential for competitive reasons.

Modified terms and conditions are as follows:

- II (a) The agreement acknowledges the completion and mutual approval of a pre-design report;
- II (b) Enwave, at its expense, provides a new intake for the IFP to the City, using HDPE pipe which the City has approved for this project;
- II (c) Enwave, at its expense, provides upgrades to the IFP, upgrades to the JSPS to enable an ETL between the existing JSPS and expansion to JSPS;
- II (d) All works that convey City water will be owned by the City; as part of the agreement, the City will consider a lease to own arrangement as an alternative to ownership if feasibility is demonstrated by Enwave to the satisfaction of the City operationally, financially and legally;
- II (e) Enwave shall provide a performance bond and payment bond during construction of the project works;
- II (f) Enwave shall reimburse the City for all incremental operating, maintenance, repair and rehabilitation costs associated with the cooling project;

- II (g) Enwave shall limit the temperature of the return water from the heat exchangers to not more than 13.3 degrees Celsius;
- II (h) The City shall use best practices to minimize heat gain in the treatment and transmission of deep lake water from the intake to the energy transfer water loop; Enwave shall be responsible for costs above and beyond those required for winterization of the Island Plant;
- II (i) Enwave shall pay the City an energy transfer fee of 0.75 cents per tonne-hour of cooling transferred through the ETL, to be increased annually by inflation represented by the Consumer Price Index;
- II (j) The term of the agreement shall be 50 years; and
- II (k) If Enwave and the City do not obtain all external approvals for the project within two years of the date of the agreement and commence construction of the new intake within one year of receipt of the approvals of the new intake, Enwave or the City may terminate the agreement.

The following are additional terms and conditions as a consequence of the modified project approach in specific areas:

- III (a) The owner of the intake, proposed to be the City, will bear the cost of an easement fee which may be imposed by the Province of Ontario possibly in excess of \$50,000 annually for the intake to be located on the bed of Lake Ontario;
- III (b) The City and Enwave to be responsible for the operation, maintenance, repair and rehabilitation of project works as defined in the agreement;
- III (c) The City provides City-owned land south of JSPS at no cost to Enwave for expansion of the station at Enwave's cost;
- III (d) Enwave provides an expansion to JSPS in which Enwave will provide heat exchangers, booster pumps and the rest of the cooling system at its sole expense;
- III (e) JSPS expansion to be owned by the City;
- III (f) Enwave provides and installs two diesel generators dedicated for back-up power supply to two JSPS pumps, at its expense;
- III (g) The City provides use of JSPS expansion to Enwave for cooling project;
- III (h) The City provides use of existing power supply facilities at JSPS to enable installation by Enwave of power supply for DLWC equipment at JSPS expansion facility at Enwave's cost;

- III (i) The City and Enwave to implement the contingency plan to address scenarios representing a risk to continuous supply of water for cooling purposes;
- III (j) Enwave to bear incremental contingent supply costs applicable to a contingency scenario;
- III (k) Enwave to provide watermain linking Island distribution system to the mainland network, at its expense, for contingent supply;
- III (l) The City to make Harris Filtration Plant (HFP) available as emergency back-up to supply from IFP and for other scenarios provided operationally feasible and temperature of water is acceptable for cooling;
- III (m) Enwave to pay for any decommissioning at end of project life and any damage to City facilities as a result of their operation during the life of the project; and
- III (n) The City agrees not to enter into an agreement with any other party regarding provision of lake water cooling requiring capacity from IFP and HFP as committed to under this agreement.

Authorization to execute the ETA on the basis of the terms and conditions listed above is requested to enable the next phase of the project to proceed expeditiously to make DLWC a reality.

Conclusions:

Pre-engineering work has progressed to the point where both the City and Enwave staff are satisfied that the DLWC project can be implemented successfully. Approval to expand JSPS to facilitate the project and authorization to execute the ETA on the basis of the terms and conditions summarized in this report are required to enable project financing and implementation to proceed.

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The Works Committee reports, for the information of Council, having also had before it during consideration of the foregoing matter a communication (July 3, 2001) from Mr. Tony O'Donohue, President, Environmental Probe Ltd., advising that he has supported the Deep Lake Water Cooling project since it was first introduced in 1986; and that if properly implemented, it can be a very positive energy and environmental tool for Toronto.

The following persons appeared before the Works Committee in connection with the foregoing matter:

- Mr. Steven Zucchet, Chief Operating Officer, Enwave District Energy Limited;
- Mr. Tony O'Donohue, President, Environmental Probe Ltd.; and
- Councillor David Shiner, Ward 24 – Willowdale.

(The attachment referred to in the foregoing report was forwarded to all Members of Council with the Supplementary Agenda for the Works Committee meeting of July 4, 2001, and a copy thereof is on file in the office of the City Clerk, City Hall.)

(City Council on July 24, 25 and 26, 2001, had before it, during consideration of the foregoing Clause, the following report (July 16, 2001) from the Acting Chief Administrative Officer and Acting Chief Financial Officer:

Purpose:

To respond to a request of the Works Committee regarding the ownership of system modifications to the water system to facilitate the deep lake water cooling project.

Financial Implications and Impact Statement:

There are no immediate financial implications from this report. However, there is some potential to increase the value of Enwave and the City's shareholding through modified ownership structure of capital modifications, which is still being investigated.

Recommendations:

It is recommended that this report be received for information.

Background:

At its July 6th meeting, the Works Committee passed a motion that requested "...the Interim Chief Financial Officer, in consultation with the Chief Administrator's Office, to report directly to Council for its meeting on July 24, 2001, on any adjustments to the arrangements that might minimize the taxes payable, while ensuring the City's protection and control of its water supply."

Comments:

The DLWC project involves the construction of various physical assets, most significantly a new intake line, that will be used jointly by Enwave and the City's water system during the 50 year term of the Energy Transfer Agreement (ETA).

The draft ETA currently contemplates the transfer of title of the new intake line to the City once construction is completed, scheduled to take place in 2003. However, in recognition of the

potential value to Enwave of retaining ownership of the intake (and to the City as its shareholder), the City has committed to consider an amendment to allow Enwave to retain ownership during the term of the agreement. Should terms be identified that adequately protect the City's interests, the agreement will be amended accordingly. At the end of the ETA, it is essential that the City has ownership of these assets for its continued use for the potable water system.

A determination is expected once all tax, financing, legal, and operational considerations have been thoroughly understood. Enwave and City staff will be meeting and relying on expert advice as necessary to resolve this issue expeditiously.

Conclusions:

As part of the Energy Transfer Agreement, the City is reviewing its requirement to own certain shared assets constructed by Enwave, especially the new intake line, during the term of the agreement. Should the City's interests in terms of delivery of potable water be adequately protected, the agreement will be amended accordingly.)