PW-E2-1

Region of Peel
Working for you

REPORT
Meeting Date: October 25, 2012
Regional Council

DATE: October 12, 2012

REPORT TITLE: **CLARKSON WASTEWATER TREATMENT FACILITY EXPANSION PHASE 2- PRE-PURCHASE OF ONE COGENERATION UNIT DOCUMENT 2012- 557N, PROJECT 08-2915**

FROM: Dan Labrecque, Commissioner of Public Works

RECOMMENDATION

That the Region of Peel enter into direct negotiations with Gas Drive Global LP to pre-purchase one cogeneration engine in a containerized unit as a part of the Clarkson Wastewater Treatment Facility Phase 2 Expansion, in accordance with Purchasing By-law 63-2008;

And further, that the Director of Purchasing, upon successful negotiations with Gas Drive Global LP, be authorized to approve the award;

And further, that the required documents be executed by the duly authorized signing officers of the Regional Corporation.

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REPORT HIGHLIGHTS

- As part of the Clarkson Wastewater Treatment Plant Phase 2 Expansion, the Environmental Study Report identified the need to evaluate enhanced gas storage in conjunction with the existing cogeneration unit, or alternatively expand the cogeneration capability with additional gas storage.
- Currently an existing cogeneration unit at the Clarkson Wastewater Treatment plant is undersized and can no longer meet the needs of the plant. An investigation was undertaken by staff and the consultant to establish the cost to refurbish the existing cogeneration unit and building with the addition of gas storage versus the purchase of a new cogeneration unit with gas storage.
- A new cogeneration unit was determined as the optimal option compared to the refurbishment of the existing cogeneration system as significant capital cost savings and long term life cycle costs can be realized.
- The GE Jenbacher containerized cogeneration unit supplied by Gas Drive Global LP demonstrated a significant difference in cost savings in the long term life cycle costs based on high engine efficiency.
- By pre-purchasing a GE Jenbacher containerized unit, further cost savings are recognized through a shortened design time frame and reduced costs, expedited delivery and installation of the unit thereby utilizing the plant digester gas for energy production to supplement the Clarkson Wastewater Treatment Plant.
- A further incentive is funding of approximately 2.4 million dollars from the Ontario Power Authority (OPA), Process and System Upgrade Initiative (PSUI Program) for the design study, capital project construction and/or implementation to reduce the electricity consumption by the wastewater facility.

DISCUSSION

1. Background

The Clarkson Wastewater Treatment Plant Phase 2 Expansion addressed increases to the plant rated treatment capacity of 350 MLD by the year 2031 that will consequently increase the quantity of digester gas generated from the anaerobic sludge digestion process.

The existing digester gas handling system was assessed to ensure that the most efficient use of digester gas for energy use was realized and to ensure that sufficient flaring capacity is available for digester gas when the gas is not in demand by plant processes.

The existing cogeneration unit at the Clarkson Wastewater Treatment plant is undersized and can no longer meet the needs of the plant or the mandatory current Codes required. As a result, the digester gas is currently collected in the existing system and is being used as a fuel for the hot water boilers and excess gas is flared to the atmosphere via two waste gas burners.

To optimize the efficient use of digester gas for energy production at the Clarkson Wastewater Treatment Plant, an investigation was undertaken by staff and the consultant and three potential solutions were explored.

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2. Findings

The first solution reviewed was the refurbishment of the existing cogeneration unit but it was determined to be a high risk option that fails to meet the optimum energy production. The upgrade of the existing cogeneration unit presents significant technical challenges as the existing building that houses the unit requires upgrades to meet current Codes.

As a result, two other solutions were explored. A digester gas handling system with one new cogeneration unit enclosed in a new building and gas storage was deemed to produce optimal energy because excess digester gas would be used by the hot water boilers and the waste heat would be used to supplement the heating needs of the plant. However, the enclosure of new cogeneration unit in a new building bears significant capital costs along with longer design and construction periods.

The final option explored was the installation of a digester gas handling system with one new containerized cogeneration unit instead of in a new building which consequently results in significant capital cost savings that will be realized within a short pay back period while providing the same optimal energy production. This option is both technically and financially feasible which includes a complete turn-key installation that provides a smooth start up, operation and maintenance.

Solutions Reviewed	One Non- containerized Cogeneration unit (Housed in a new building)	One containerized Cogeneration unit (Housed within existing facility)
Capital Cost	**$9,810,000**	**$4,805,000**
Annual Savings	**$794,000**	**$1,002,000**
Payback Period	**9 years**	**3 years**
Energy Output	**2,900 kW**	**2,900kW**

* Exclusive of OPA funding

Through further investigation it was established that the purchase of a GE Jenbacher Cogeneration unit JMC 420 specifically, presents greater savings as a result of the higher energy outputs and engine efficiency as compared with the Toromont CAT Cogeneration unit.

Additional cost savings can be recognized through the pre-purchase of the GE Jenbacher containerized Cogeneration unit as there will be a reduction in design period and related costs as well as expediting the delivery and installation of the unit, thereby utilizing the plant digester gas for energy production and electricity use sooner and consequently accelerating the reduction in Clarkson Wastewater Treatment Plant's environmental footprint.

A further incentive is available through funding from the Ontario Power Authority (OPA), Process and System Upgrade Initiative (PSUI Program) for the design study, capital project construction and/or implementation to reduce the electricity consumption by a facility.

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Discussions with OPA, Enersource and staff are underway with a favourable outcome in receiving the grant as this project meets all or most of the PSUI requirements.

Staff are confident that the pre-purchase of a GE Jenbacher cogeneration unit is advantageous from a financial, operational and sustainability standpoint.

3. Proposed Direction

Staff propose to directly negotiate with Gas Drive Global LP for the pre-purchase of one GE Jenbacher containerized cogeneration unit with as part of the Clarkson Wastewater Treatment Plant Phase 2 Expansion in accordance with Purchasing By-Law 63-2008.

FINANCIAL IMPLICATIONS

Funding is available under Capital Project 08-2915 for all project costs.

Dan Labrecque
Commissioner of Public Works

Approved for Submission:

David Szwarc

D. Szwarc, Chief Administrative Officer

For further information regarding this report, please contact Wendy Teufel at extension 134 or via email at wendy.teufel@peelregion.ca.

c. Legislative Services
L. Morrow, Acting Director, Purchasing
Manager, Financial Support Unit (FSU)