

TO:	CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON MAY 14, 2012
FROM:	JOHN BRAAM, P. ENG. ACTING EXECUTIVE DIRECTOR, PLANNING, ENVIRONMENTAL AND ENGINEERING SERVICES & CITY ENGINEER
SUBJECT:	RENEWABLE ENERGY PRODUCTION FROM THE GREENWAY FLUIDIZED BED INCINERATOR

RECOMMENDATION

That, on the recommendation of the Acting Executive Director Planning, Environmental and Engineering Services and City Engineer, this report **BE RECEIVED** and reported to Municipal Council for their information.

PREVIOUS REPORTS PERTINENT TO THIS MATTER
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BACKGROUND

The City of London annually produces 17,000 dry tonnes of biosolids from the six wastewater treatment plants. These solids are dewatered and incinerated at the Greenway Plant in a fluidized bed incinerator. The incineration process produces a large amount of waste heat, some of which is recovered to sustain the process but a significant amount is not captured. Staff are evaluating utilizing this waste heat to generate renewable hydro with GHD Consulting. GHD agreed to do a preliminary investigation on the cost feasibility of a heat recovery/generation system followed by a more detailed process and cost analysis if warranted.

The preliminary report has been completed and evaluated two options for a generation system, conventional steam and an Organic Rankin Cycle (ORC) turbine/generator. The ORC system is based on the same principles as a steam system but an organic fluid is used in place of water. This allows the system to operate more efficiently at lower pressures and the turbines are less susceptible to pitting in comparison to steam systems; steam also requires a stationary engineer with specific licenses while an ORC system does not. Steam systems are well proven while ORC generation systems have been in operation over the last 5-10 years, mainly in Europe. The challenge for both systems will be the design of the heat exchanger used to recover the waste heat as ash contained in the exhaust gas is abrasive. Both steam and ORC generation systems are commercially available.

The preliminary evaluation determined that a traditional steam generation system is unfeasible, however; GHD has determined that an ORC system has the potential to generate approximately \$633,000 (700kW) worth of electricity at current market rates at an estimated capital cost of \$7.5 million. \$167,400 in additional heat may also be available although a beneficial use for this heat has not been identified. With potential annual revenues of \$800,000, the project could have a payback of 7-10 years including capital amortization and operating costs. These numbers are considered conservative.

Given the promising initial results, GHD will proceed with the more detailed process and cost analysis. We will also investigate opportunities to utilize the additional waste heat recovered in addition to any premiums and funding which may be available for the project.

Agenda Item #

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This report was prepared within the Wastewater Treatment Operations Division by Georgie Gauld, Division Manager.

SUBMITTED BY:	RECOMMENDED BY:
GEORDIE GAULD DIVISION MANAGER WASTEWATER & TREATMENT OPERATIONS	JOHN BRAAM, P.ENG. ACTING EXECUTIVE DIRECTOR, PLANNING, ENVIRONMENTAL AND ENGINEERING SERVICES AND CITY ENGINEER

May 9, 2012