



City of  
**Peterborough**

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**To:** **Members of the Committee of the Whole**

**From:** **Blair Nelson, Acting Director of Utility Services**

**Meeting Date:** **May 11, 2015**

**Subject:** **Report USEP15-003  
Report on Emergency Measures Taken and Establishment of a  
Budget for the Waste Water Treatment Plant Digester #3  
Structural Assessment**

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## **Purpose**

A report to inform Council of emergency measures taken to ensure the integrity of Digester #3 at the Waste Water Treatment Plant (WWTP) and to establish a budget to clean and structurally evaluate Digester #3.

## **Recommendations**

That Council approve the recommendations outlined in Report USEP15-003 dated May 11, 2015, of the Acting Director of Utility Services, as follows:

- a) That a 2015 Capital Budget in the amount of \$1,200,000 be created and funded from the Sanitary Sewer Reserve Fund for the cleaning and subsequent structural assessment plus reporting of condition and recommended repairs or rebuild of the Waste Water Treatment Plant Digester #3;
- b) That Carvajal Structural Engineers Inc. (CSE Inc.), 605-3500 Dufferin St. Toronto, Ontario, M3K 1N2, be authorized to conduct a structural assessment on Digester #3 at a cost of \$24,310.00 plus \$3,160.30 HST for a total of \$27,470.30; and
- c) That Maple Reinders Constructors Ltd.(MRCL) 2660 Argentia Road, Mississauga, Ontario, L5N 5V4, be authorized to empty and clean Digester #3, prepare the digester for full internal examination, and assist with lighting, scaffolding, safety

gear etc. at an estimated cost of \$930,000 plus HST of \$120,900 for a total cost of \$1,050,900 on a time and material basis.

## **Budget and Financial Implications**

Based on the estimated prices provided in this report, the budget required to clean Digester #3 and undertake a structural assessment is \$954,310 exclusive of taxes. When taxes are applied and a small contingency is included, the total budget requested is \$1,200,000 funds for which will come from the Sanitary Sewer Reserve Fund. After a draw of \$1,200,000, the Sanitary Sewer Reserve Fund will have \$5,969,607 remaining.

## **Background**

Anaerobic Digestion is a critical component of proper sewage solids treatment at wastewater facilities. This is a gas producing process that is regulated under both the Ministry of the Environment and Climate Change (MOECC) and the Technical Standards and Safety Association pressure control regulations. The City of Peterborough has two large Digester units (#3 & #4). Digester #4 was built in 2000 and is presently shut down for cleaning and any rehabilitation that may be needed after a detailed evaluation is completed.

Digester #3 was constructed in 1960 with additional work completed in 1993 to add external mixers. No structural upgrades or repairs have been performed on this digester vessel since its commissioning.

### **1. Situation with Digester #3**

On March 31, 2015 a rupture occurred on the outer structure of Digester #3 which resulted in a partial shut-down of the digester. A release of raw undigested sludge occurred, but was captured and caused no environmental impacts to the nearby Otonabee River. A Spill Report was written and the MOECC was notified. The MOECC was satisfied with the City's response and will continue to monitor the situation.

### **2. Staff Response (Short Term)**

The immediate response from staff was to remove insulation from the north draft tube of the digester to pin point the location of the leak. Two holes were discovered in the tube. The mixer was shut down and sand bags were placed to contain the spill. A sheet of rubber was placed over the holes and secured with ratchet straps to control any further leakage. The following day, the top layer of soil impacted by the spilled material was scraped off and the area was covered with sand. The sand bags have been left in place.

Section 13 of Purchasing By-law sets out guidelines for procurement during an emergency. An emergency is defined in the Purchasing by-law as a "...situation, or the threat of an impending situation, which may affect the environment,...". The spill from Digester #3 was not, by itself, an emergency situation but coupled with the fact that Digester #4 was off-line for cleaning it was felt imperative to react immediately to not only stem the leak but to ensure that this leak was not the first of others to come. Accordingly, in the opinion of the Director of Utility Services at the time, under Section 13.1.1.a.i of the Purchasing By-law he was authorized "... to approve the purchase of goods and/or services deemed necessary to remedy the emergency." which was the hiring of CSE Inc. to examine the exterior of the digester and provide a preliminary structural review of the digester based on the currently accessible areas of the digester. City staff is familiar with the work done by CSE Inc. and is aware that CSE Inc. has knowledge of Digester Vessels, and has performed structural assessments on other facility structures.

On April 9, 2015 CSE Inc. did attend on site and determined that a more detailed investigation needs to be performed based on the age of the digester tank, the environmental exposure of the interior concrete walls of the tank, the structural integrity concerns with the draft tubes and the poor condition of the roofing system over the tank roof.

The Purchasing By-law also requires the Department Director to report on the actions taken and reasons therefore after the emergency. This report is in response to this requirement.

### **3. Staff Response (Longer Term)**

It is imperative that a full detailed structural review (inside and outside) be undertaken once the digester is taken off-line and is fully cleaned so that access to the interior slab-on-grade, walls and roof underside can be obtained. This cannot be done until Digester #4 is put back in service.

### **4. Next Steps**

The next steps beyond constantly checking that no more spills occur are to:

- Establish a budget to clean Digester #3;
- Establish a budget to undertake a structural analysis of Digester #3;
- Award the cleaning and structural analysis work for Digester #3;
- Report to Council on the results of the structural analysis; and
- Undertake necessary repairs or replacement.

#### **4.1 Establish a Budget to Clean Digester #3**

Based on the estimated price to clean Digester #4 and the fact that Digester #3 is older and received more of the 2004 flood material than did Digester #4, the estimated cost to clean Digester #3 is \$730,000. This work will be conducted on a time and material basis and will be carefully monitored and managed to mitigate cost exposure.

An additional cost will be the procurement, erection and dismantling of scaffolding, lights, power equipment and safety/recovery gear, to allow the structural review to be undertaken both inside and outside of the building. The estimated cost for this equipment is \$200,000.

#### **4.2 Establish a Budget to Undertake a Structural Analysis of Digester #3**

Based on estimates supplied by the CSE Inc., a full structural analysis exclusive of any specification and plan preparation, contract administration or works by other engineering specialists would cost an estimated \$24,310 exclusive of taxes.

#### **4.3 Award the Cleaning and Structural Analysis Work for Digester #3.**

CSE Inc., under the emergency procurement clause of the Purchasing By-law has examined the outside of the digester. While there is now time to issue an RFP for firms to bid on the more detailed structural analysis, Section 9.1.2. i of Purchasing By-law 14-127 permits a non-competitive procurement when “a Consultant has been used to provide a service, and additional work is required that builds upon or is dependent upon the previous work undertaken, and when it could not reasonable be determined at the time the original work was approved additional services would be required”.

Inasmuch as CSE Inc. has undertaken the preliminary review and has identified the need to do a full detailed structural review of Digester #3 to determine the overall integrity of the building it is prudent to engage them to do the detailed review. The Director of Corporate Services, as required by the Purchasing By-law is in agreement with this.

The cleaning of Digester #4 was included with the Phase 4 construction presently underway at the WWTP and the Phase 4 contractor (Maple Reinders) was engaged to do this work. By using the onsite General Contractor to clean Digester #3, the City avoids having multiple contractors on the same site, with the potential for the City, under Ministry of Labour laws, to become the Constructor, a situation that should be avoided. Maple Reinders also have all appropriate MOL permitting, bonding, insurance, equipment, and human resources on the ground to conduct this portion of the work quickly and cost effectively.

For the same reasons, it is proposed under Section 9.1.2.d of Purchasing By-law 14-127 where it states “when it is necessary to ensure continuity of responsibility...” to use Maple Reinders, to clean Digester #3. The Director of Corporate Services, as required by the Purchasing By-law is in agreement with this.

#### **4.4 Report to Council on the Results of the Structural Analysis**

The structural analysis will not be possible until Digester #3 is cleaned and this cannot happen until Digester #4 is back on-line. It is estimated that a report to Council on the condition of Digester #3 will not be available until the late third quarter or early last quarter of 2015. This report will include the necessary steps to get Digester #3 back on-line and in good condition for many more years of operation.

#### **4.5 Undertake Necessary Repairs**

A further report on this matter will be submitted to Council once the full extent of the required repairs or possible replacement and cost associated with the repairs or complete replacement are ascertained.

### **5. Timelines**

If the recommendation is approved, the Projects will be confirmed via purchase orders to Maple Reinders Constructors Ltd., and CSE Inc. before the work commences.

Maple Reinders will commence the work on Digester #3 once Digester #4 is put back in service. The expected commencement of Digester #3 cleaning and assessment with associated recommendations on works required for Digester #3 is late June to early August 2015, with a target date of early September 2015 for the final report. City staff will provide an update report to Council at that time including refined costs for repair and/or rebuild of the Digester based on the recommendation of the Professional Structural Engineer.

Due to the sensitivity and potential environmental impacts, the Ministry of Environment will be briefed on all works associated with this project. This work will potentially generate noise levels that may irritate neighbours close to the plant and therefore a notice of such works will be delivered to households in the nearby vicinity of Digester #3.

## Summary

Digester #3 has been recently compromised and requires an immediate internal and external structural assessment. To perform such works significant preparation is required. Timing is critical and City staff will use resources presently on site and known to the City. Once the works are completed a follow-up report to Council describing next steps will be submitted.

Submitted by,

Blair Nelson, P. Eng.  
Acting Director, Utility Services

Contact Name:  
Patrick Devlin, HBSc.  
Manager, Environmental Protection  
Phone 705-742-7777 ext 2624  
Toll Free: 1-855-738-3755  
Fax 705-743-0091  
E-mail address: [pdevlin@peterborough.ca](mailto:pdevlin@peterborough.ca)