



City of  
**Peterborough**

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

**From:** **W. H. Jackson, Director of Utility Services**

**Meeting Date:** **November 2, 2015**

**Subject:** **Report USEP15-009  
Update on Digester #3 and Establishment of a Budget for  
Repair of the Digester**

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## **Purpose**

To inform Council of the results of the structural analysis of Digester #3 at the Waste Water Treatment Plant (WWTP) and to establish a budget to repair the digester.

## **Recommendation**

That Council approve the recommendation outlined in Report USEP15-009 dated November 2, 2015, of the Director of Utility Services, as follows:

That a 2015 Capital Budget in the amount of \$6,590,000 be created and funded from the Wastewater Reserve Fund supported debentures for design, tender, contact administration and repair of the Wastewater Treatment Plant Digester #3.

## **Budget and Financial Implications**

Based on the estimated prices provided in the report from CSE Structural Forensic and Rehabilitation Services (CSE Inc.) the budget required to provide consulting services to design, tender and administer the repair of Digester #3 as well as the actual repair are shown in Table 1.



**Table 1: Estimated Costs to Design, Tender, Contract Administer and Repair Digester #3.**

Item	Estimated Cost
Demolition/Re-Construction and Mechanical/Electrical Restoration	\$4,730,000
Engineering Design and Contract Administration	\$ 743,000
Contingency	\$1,000,000
Taxes Payable by the City	\$ 113,925
<b>Total</b>	<b>\$6,586,925</b>

The cost of \$6,586,925 net of HST rebate will be funded from the Wastewater Reserve Fund supported debentures..The current uncommitted balance of the Wastewater Reserve Fund is \$6,825,576.

## Background

Anaerobic Digestion is a critical component of proper sewage solids treatment at waste water 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 and #4). Digester #4 was built in 2000 and was recently cleaned and rehabilitated.

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. Background to Present Situation

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 continues to monitor the situation.

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.



Under the emergency procurement guidelines of Purchasing By-law 14-127 the services of a consulting firm (CSE Inc.) was secured to ascertain the next steps to be taken. On April 9, 2015 CSE Inc. did attend on site and determined that a more detailed investigation needed 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.

Based on this assessment, Council, at its meeting of May 19, 2015 in considering Report USEP15-003 authorized the establishment of a budget to clean and undertake a detailed structural analysis of Digester #3.

## **2 Results of Structural Analysis**

The structural analysis has now been completed and the resulting report has detailed what needs to be done to get Digester #3 back on-line and in good condition for many more years of operation.

The analysis revealed that the digester's primary structural components were in good to very good condition. Very little effort will be required to restore the primary structural components of the digester.

Most of the restoration/repair work will be associated with the non-structural components which include the replacement of the masonry exterior cladding, the side mixers, the interior piping, the mechanical appurtenances, the waterproofing and the gas proofing systems. Most of the pipes and mechanical appurtenances will be replaced.

The Digester's roof waterproofing will be re-designed to provide a new roofing membrane system with new insulation which is protected by an exposed concrete topping. In addition, an emergency second exit from the roof which leads directly to ground level will be included in the design.

It is anticipated that the design of the works to restore Digester #3 to full service will consist of three stages: the Demolition Stage, the Re-Construction Stage and the Mechanical/Electrical Systems Restoration Stage.

The Demolition Stage basically strips the Digester down to its primary structural components. Re-Construction will include a new roofing/waterproofing membrane system. Once these two stages are complete, the Digester will be fully restored from a structural perspective including new/repared mechanical systems, side mixer platforms, new cladding and insulation, and damp proofing below grade areas as well as sealing all exposed concrete surfaces.



### **3. Cost Analysis**

The estimated cost to undertake the required work including engineering and contingencies is \$6,586,925 net of HST rebate.

The cost includes a substantial contingency of \$1,000,000. This contingency will cover any additional work that may need to be done for both engineering and restoration. Until both aspects of the project are tendered (Consulting services to design, tender and contract administer as well as Contractor services to repair Digester #3), these costs are the best available estimates based on what is known now using 2015 construction related costs.

### **4. Timelines**

If the recommendations of this report are approved, a consultant will be hired under a Request for Proposals and ultimately a repair contractor will be hired under a Request for Tenders.

It is expected that this work will take a total of 8-12 months.

### **5. Compliance with Environmental Compliance Approval**

During the time that Digester #3 is not operating, the City may have to transport sludge via truck to other facilities if our WWTP cannot maintain compliance with MOECC regulations. If this occurs as a regular event, a further report will be submitted to Council for information.

## **Summary**

Digester #3 needs to be repaired. A detailed structural analysis has been prepared and the necessary repairs will be undertaken as expeditiously as possible.

Submitted by,

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