



**CITY OF HAMILTON**  
**PUBLIC WORKS DEPARTMENT**  
**Environmental Services Division**

<b>TO:</b>	Chair and Members Public Works Committee
<b>COMMITTEE DATE:</b>	June 3, 2019
<b>SUBJECT/REPORT NO:</b>	Replacement of the Supervisory Control and Data Acquisition System at the Central Composting Facility (PW19042) (City Wide)
<b>WARD(S) AFFECTED:</b>	City Wide
<b>PREPARED BY:</b>	Catherine McCausland (905) 546-2424 Extension 4203
<b>SUBMITTED BY:</b>	Craig Murdoch Director, Environmental Services Public Works Department
<b>SIGNATURE:</b>	

**RECOMMENDATIONS**

- (a) That the single source procurement, pursuant to Procurement Policy #11 – Non-competitive Procurement to Maple Reinders Constructors Limited for the replacement of the Supervisory Control and Data Acquisition System at the Central Composting Facility as outlined in this Report be approved;
- (b) That the General Manager of the Public Works Department be authorized to negotiate enter into and execute any amendments to Contract dated December 21, 2005 with Maple Reinders Constructors Limited (C11-105-03) respecting the operations and maintenance of the Central Composting Facility to reflect recommendation (a), in a form satisfactory to the City Solicitor.

**EXECUTIVE SUMMARY**

The Central Composting Facility (CCF) has been operating since 2006 and still utilizes its original Supervisory Control and Data Acquisition (SCADA) system to monitor and control the process. This system is critical to ensuring the CCF operates in compliance with the City’s existing Environmental Compliance Approvals (ECA) issued by the Ministry of Environment, Conservation and Parks (MECP). As the current SCADA system is now approximately 14 years old, it is no longer supported by the supplier

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OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.

OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.

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which has resulted in it becoming unreliable and potentially exposing the City to an increased risk of operating out of compliance.

Like all technology, the SCADA system is software driven and operates much like a computer. Technology changes over time and it gets to a point where it is no longer supported for updates or upgrades and parts become harder to find.

Staff contacted other cities who operate similar composting facilities to Hamilton, including Ottawa Valley, City of London, City of Calgary and City of Guelph. All of the facilities use SCADA systems to monitor and control plant processes and all of those systems have been programmed by companies from Europe. Staff also learned the success of those systems relied heavily on the programmer's knowledge of composting processes when developing the framework. Maple Reinders Construction Limited (MRCL) has the experience, expertise and proven track record of successfully completing these projects. Hiring MRCL will ensure the work is completed successfully and will allow the City to continue to build trust with the community and the MECP with regards to the CCF.

**Alternatives for Consideration – See Page 5**

**FINANCIAL – STAFFING – LEGAL IMPLICATIONS**

Financial: Upgrade will be funded from the 2019 approved capital budget Project ID #5121949003 (CCF Lifecycle Replacement) at an amount of approximately \$500,000.

Staffing: The recommendations contained in this report will have no impact on City staffing levels.

Legal: Legal Services has been consulted during the preparation of this report. Pending approval from Council, an amending agreement to the contract dated December 21, 2005 with Maple Reinders Constructors Limited (C11-105-03) will be prepared for execution.

**HISTORICAL BACKGROUND**

The SCADA system is critical to ensuring that the CCF operates in compliance with the City's existing ECAs issued by the MECP and has not been replaced since the CCF began operations. Given that the system is 14 years old, it has exceeded end of life and needs to be replaced.

As part of the voluntary shutdown of the CCF in June 2018 and the subsequent restart of operations in February 2019, City staff has been in discussions with the MECP about

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amendments to the ECA. Going forward, the MECF would like data captured that exceed the capabilities of the existing SCADA system used to control and monitor the operations of the CCF. As a result of those discussions, staff determined that in order to satisfy the MECF requirements for the pending ECA amendment application, this replacement of the SCADA system would be a good opportunity to also meet the requirements of the MECF. The SCADA system has reached end of life and cannot be modified. When the system is replaced, the programming and replacement can be done in such a way as to capture the data that the MECF has requested as a condition of an amended ECA.

The contract between the City and MRCL places the operational responsibility on the operator. Any process risks rest with them. If the City were to hire a company not familiar with the CCF processes, operational risks could transfer to the City.

Staff recommends the SCADA replacement be sole sourced for the following reasons;

- Companies that have experience developing SCADA systems do not have the required experience with composting facilities
- There is little room for error on this project as the City continues to rebuild the trust of the community and the MECF
- As MRCL is the current contract operator of the facility until December 31, 2020, it reduces the risk that this project will not be completed to the required specifications
- Having completed SCADA work in other commercial, in-vessel composting facilities such as Guelph and Calgary MRCL will be able to perform this work more cost effectively as they will not be starting the process from scratch
- The facilities such as Guelph and Calgary are operated successfully demonstrating the quality of MRCL's work

It is the expectation of the MECF that the CCF is operated in compliance and in a manner that does not create adverse effects on the surrounding areas. With the recent closure and re-start of the CCF it is especially important to demonstrate the City's due diligence. By upgrading to a modern SCADA system, it will maintain the operational viability of the CCF, improve operational efficiency and allow for the introduction of additional infrastructure upgrades if required. It will also allow the City to continue to build trust with the surrounding community and the MECF.

## **POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS**

The City is currently in the process of an amendment to the CCF's existing waste and air ECAs for the CCF. The current SCADA system does not have the capabilities to perform the monitoring and process oversight requested by the MECF to operate in

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accordance with the proposed amended ECA. These new requirements can be incorporated into the new SCADA system.

By-law 17-064 Procurement Policy, Section 4.11, Policy #11 Non-competitive Procurements requires that Council approve a single source negotiation requests that are valued at \$250,000 or greater.

## **RELEVANT CONSULTATION**

City staff consulted with the following:

- Corporate Services Department, Legal Services Division,
- Corporate Services Department, Finance and Administration Division
- Corporate Services Department, Procurement Section has been consulted with respect to adherence to the City's Procurement Policy and have provided comment on this report
- Public Works Department, Hamilton Water Division, Plant Maintenance & Technical Services Section

## **ANALYSIS AND RATIONALE FOR RECOMMENDATIONS**

The reliability and risks of continuing with the current SCADA system outlined as follows;

- The current SCADA system operates using Windows XP which is no longer supported by Microsoft
- The system cannot be updated as no further versions of Windows XP are available
- The labview, which is the current SCADA software is also obsolete and no longer supported
- Increased risk of cybersecurity attacks due to continued deterioration
- Requires frequent reboots resulting in data loss, lack of reliability and potentially putting the CCF out of compliance with the ECAs
- Persistent system bugs that are occurring cannot be fixed or eliminated.
- SCADA system cannot be revised to reflect any operational or data requirement changes.
- Risk of complete system loss could affect the CCF's ability to maintain building pressure, monitor pasteurization, control biofilter health and manage process water

Monitoring the CCF operational parameters is a requirement of the existing ECA. The current SCADA system has become unreliable, resulting in data gaps and putting the City at risk of operating the facility out of compliance. The current ECA amendment application will also result in additional parameters that the MECP has indicated that they wish the City to track. By upgrading this system now, it places the City in a

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position to be able to respond to those required changes in a responsive and timely manner with a stable and reliable system.

**ALTERNATIVES FOR CONSIDERATION**

If Council chooses not to approve the recommendations in this report then City staff would conduct an open competitive procurement process (either a Policy #5.3 Request for tender process or Policy #5.4 Request for Proposals process). The concerns associated with this alternative relate to potential interference with on-going operations, potential lack of experience and knowledge with the facility and composting processes and project completion timelines associated with the Request for Tender process. This could also result in delays meeting the MECPs monitoring requirements for the current ECA amendment application as well as increased data gaps resulting from frequent reboots.

**ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN**

**Economic Prosperity and Growth**

Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

**Healthy and Safe Communities**

Hamilton is a safe and supportive City where people are active, healthy, and have a high quality of life.

**Clean and Green**

Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces.

**Built Environment and Infrastructure**

Hamilton is supported by state of the art infrastructure, transportation options, buildings and public spaces that create a dynamic City.

**Our People and Performance**

Hamiltonians have a high level of trust and confidence in their City government.

**APPENDICES AND SCHEDULES ATTACHED**

Not applicable.