



CITY OF HAMILTON
PUBLIC WORKS DEPARTMENT
Hamilton Water Division

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	November 14, 2016
SUBJECT/REPORT NO:	Sewer Lateral Cross Connection Program Extension (PW14028a) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Donald Young (905) 546-2424, Extension 6394 Nick Winters (905) 546-2424, Extension 1474
SUBMITTED BY:	Andrew Grice Director, Water & Wastewater Operations Hamilton Water Division
SIGNATURE:	

RECOMMENDATION

- (a) That approval be given for a permanent Sewer lateral Cross Connection Program; and,
- (b) That the two temporary (24 month) staff approved for the pilot program in Report PW14028 be made permanent to provide for the administration and management of the Sewer Lateral Cross Connection Program and be referred to the 2017 Water and Wastewater/Storm Rate Budget.

EXECUTIVE SUMMARY

In 2014 Council approved an acceleration of the Sewer Lateral Cross Connection Pilot Program as part of report PW14028. The accelerated program was fully implemented between September 2015 and August 2016, and has exceeded the 65% increase in productivity that was desired by Council. The program has been highly successful, resulting in approximately 112,000 litres of sewage each day being redirected from City watercourses and the natural environment and into the City's wastewater treatment facilities (equivalent to 40.1 million litres annually, or the volume of 16.4 Olympic swimming pools).

The program's focus is correcting complete cross connections within the public road allowance. The success of the pilot program can be attributed to the cooperative approach with homeowners, the Ministry of the Environment and Climate Change (MOECC), and the work of staff in identifying and fixing cross connections. A

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permanent program would build on that success and allow the program to expand to additional areas of the City. The environmental benefits of the program support Council's environmental and related strategic goals.

Two full time temporary staff positions were approved in 2014 for the accelerated pilot program, and these resources are necessary to maintain the environmental benefits and pace of the program. The table presented in Appendix A to Report PW14028a shows the positive impact that the additional staff resources have had in identifying and correcting cross connections. Any reduction of staffing would prevent or delay the program's reach to other parts of the City and the rate of the repairs that derive the environmental benefits. Staffing was the significant limitation identified in 2014 in dealing with cross connections, and at that time staff were directed to report back on the progress and success of the pilot program in 2016.

Interim reports have been received from a thorough review of the programs offered by other cities that have a similar wastewater collection system. A direct comparator is the City of Boston who have 3 FTEs fully dedicated to the program, a \$1 Million annual consulting assignment, and the support of numerous other staff from different levels as required. Despite a mature program the City of Boston has indicated that there is no end in sight to eliminate all cross connections in their system.

Alternatives for Consideration – See Page 6

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: In order to sustain the current pace of investigations and anticipated sewer lateral cross connection corrections, the program will require approximately \$900,000 annually. \$900,000 has been requested for the program as part of the 2017 Water and Wastewater/Storm Rate Budget, and this will be reviewed annually to ensure the funding model remains appropriate.

Staffing: Approval of the recommendations in this report will increase the Divisional complement by 2 FTEs on a permanent basis. At present, there are no opportunities to move FTEs from other programs within the Hamilton Water Division to support the Sewer Lateral Cross Connection Program. Please note that the FTEs are already included in the Divisional complement and budgeted, so there will be no resulting increase in FTEs from the 2016 Water and Wastewater/Storm Rate Budget.

Legal: In 2012, the MOECC struck orders they issued against the City in 2001 regarding the contamination of the City's area receiving waters. Since 2012, the MOECC has been monitoring the City's efforts toward the identification and elimination of sewer lateral cross connections. The MOECC has verbally indicated their satisfaction and their support of the City's efforts for this initiative. Based on the City and MOECC's history on this issue since 2001, staff do not anticipate any changes in legislative requirements extending from the existing program or from the recommendations presented in this report.

HISTORICAL BACKGROUND

Sanitary sewer lateral cross connections (cross connections) describe a condition whereby sanitary waste from homes and businesses discharge into the City's storm sewer systems and subsequently into downstream watercourses. Cross connections are relatively common and constitute a threat to the quality of receiving waters. It is a problem, to varying degrees, for all municipalities that operate storm sewer systems and the City of Hamilton is no exception.

In 2001, the Ministry of the Environment and Climate Change (MOECC) issued four orders to the City for discharging contaminants to the natural environment and more specifically the Red Hill Creek. To address the 2001 MOECC orders, the City initiated a sampling program at outfalls along the Red Hill Creek and upstream sewer sheds, outfalls along the West Mountain and upstream sewer sheds and outfalls within the Dundas sewer shed. Those sampling studies began in 2002 and concluded in the summer of 2004.

From 2004 to 2009, the City continued with field investigations to further refine areas where cross connections are predominant and identify individual homes that are suspected of being cross connected. Attempts were made to gain voluntary access to homes to conduct dye tests but for the most part were unsuccessful.

Beginning in 2009, the City initiated a Sewer Lateral Cross Connection Pilot Program that addressed the failed earlier attempts to gain access into homes to collect dye testing data. From 2009 to the present, the City has identified 232 homes with complete cross connections and have corrected 229.

At the December 6, 2013 GIC Water and Wastewater/Storm Rate Budget meeting, staff was directed to report back to the Public Works Committee on options and costs to accelerate the remediation of illegal cross connections.

In 2014 City Council dealt with Report PW14028 regarding an accelerated Sewer Lateral Cross Connection Pilot Program and approved the following recommendations:

- (a) That staff be directed to increase the Hamilton Water Division complement by two additional FTE to provide the administrative and technical support necessary for the Sewer Cross Connection Pilot Program (Program) to be delivered at an accelerated output relative to the existing Program;
- (b) That staff be directed to report back in 2016 respecting the success of the Program;
- (c) That Council approve the transfer of \$450K from the Water Capital Reserve (108015) to capital account 51614-60302, Emergency Repairs – Cross Connection Program to fund the accelerated Program in 2014. Program funding for subsequent years will be achieved through the annual Water and Wastewater/Storm Rate Budget approval process;
- (d) That a copy of this report be forwarded to the Joint Stewardship Board. This

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report is fulfils recommendation “b” above providing an update on the success of the program.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

There are no policy implications associated with the recommendations in this report.

RELEVANT CONSULTATION

Corporate Services Department – Financial Planning, Administration, and Policy Division

City Manager’s Office – Legal Services Division

ANALYSIS / RATIONALE FOR RECOMMENDATION

The additional resources allocated to the Sewer Lateral Cross Connection Pilot Program have significantly increased the program’s output and benefits as detailed below. However, it has also become clear that sewer lateral cross connections (cross connections) are unfortunately common throughout the City’s wastewater collection system and throughout North American Cities in general. As a result, an ongoing effort will be required for many years in order to investigate all of the storm sewers across the City and identify and eliminate cross connections.

In order to maintain the positive momentum and to sustain the program at current levels staff have made the recommendations for a permanent program and two FTEs.

Update on Pilot Program and Rationale for Making the Program Permanent:

Staffing issues initially delayed the progress of the accelerated program, but were resolved with full staffing achieved by September of 2015. This resulted in an immediate and substantial impact on productivity.

- 62.5 km of storm sewers have been video inspected since March 2014, achieving a 75% increase above the annual average from 2009 through 2013. It should be noted that the only output within direct staff control is the quantity of storm sewer video inspection and review.
- The number of cross connections identified in 2015 and 2016 (106), is quickly approaching the number identified during the 5 year period from 2009 through 2013.
- The number of corrected cross connections between 2014 and 2016 (116), has exceeded the number of corrections completed during the 5 year period from 2009 through 2013.
- Initial cross connection investigations have been completed for the Chedoke Creek catchment area.
- Video inspections began on the program’s next area of focus, the Upper Ottawa

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Outfall catchment area.

- Possible cross connections were identified in Upper and Lower Stoney Creek, Dundas, and Flamborough through other routine inspection programs and complaints to the Ministry of Environment and Climate Change (MOECC). Staff investigated, confirmed and corrected cross connections in each of these areas.
- Calder Engineering was retained to complete new rounds of investigative sewer sampling for E-coli and caffeine.
- CH2M was retained to complete an industry review and provide recommendations for improvements to the City's Sewer Lateral Cross Connection Pilot Program.

By all accounts the program has achieved or exceeded the goals set forward in the 2014 Council report. The table presented in Appendix A to Report PW14028a provides a summary of the program deliverables for the pilot program.

Currently, the Sewer Lateral Cross Connection Pilot Program has identified 232 complete cross connections and reversed 229 cross connections in Wards 5, 6, 7, 8, 9, 10, 13 and 15. The current focus of the program is confirming and correcting cross connections identified in the Chedoke Creek and Upper Ottawa sewer catchment areas. However, in the past 12 months cross connections have also been discovered in Flamborough, Stoney Creek and Dundas. The fact that sewer lateral cross connections have been identified in a number of Wards without actively looking for them, speaks to the widespread nature of the problem and the need to eventually expand the program across the entire City.

Staff are currently working with an engineering consultant (CH2M) to review the Sewer Lateral Cross Connection Program for potential improvements, including the completion of an industry review of similar municipalities and how they approach the cross connection issue. Interim reports have identified that the City of Boston (USA) is the recognized leader in addressing cross connections, and that their program has been in place for over 25 years. The City of Boston not only has a similar population to the City of Hamilton (~650 Thousand), it also has a very similar wastewater collection system. The City of Boston currently has 3 FTEs fully dedicated to the program, a \$1 Million annual consulting assignment, and the support of numerous other staff from different levels as required. Staff have spoken with representatives from the City of Boston and learned that despite their mature program, there is no end in sight for the total elimination of cross connections. They have identified that revisiting areas of the City for which investigations have already been completed results in the identification of cross connections that were not apparent during the initial investigations, and that each area of the City requires reinvestigation multiple times. To date the City of Boston calculates that they have eliminated 2.8 Million litres per day of sewage from their local watercourses, and their work continues. Similar calculations have been completed for the City of Hamilton, and the results follow:

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- Approximately 112,000 litres of sewage per day (equivalent to 40.1 million litres annually, or the volume of 16.4 Olympic swimming pools), has been redirected away from City watercourses and into the City's wastewater treatment facilities.
- 84,000 litres of sewage per day (equivalent to 30.7 million litres annually, or the volume of 12.3 Olympic swimming pools), has been removed from the Chedoke Creek catchment area alone. This catchment area located on the West Mountain represents 75% of the completed cross connection corrections to date. This catchment area also directly feeds into 2 of the City's most prominent waterfalls, Chedoke and Cliffview Falls, which eventually discharge into Cootes Paradise.
- For every 500m of storm sewer inspected, 1 cross connection has been confirmed. The ratio of confirmed cross connections to metres of pipe inspected has remained consistent throughout the life of the program, regardless of the catchment area.
- Only 10% of the City's separated storm sewer system has been inspected for cross connections to date.

The Program currently focuses on repairs in the roadway, which effectively correct complete cross connections. However, the issue of partial cross connections (single fixtures connected to the incorrect sewer pipe in the home), persists. For every 9 complete cross connections identified by City staff, 1 partial cross connection is also identified.

Partial cross connections can only be repaired on private property, and there is currently very little incentive for homeowners to undertake these repairs. As City staff identify partial cross connections they are recorded for future action, but the eventual resolution will require an innovative solution as the Program continues to develop over the next few years.

ALTERNATIVES FOR CONSIDERATION

Three alternatives were considered, but they are not recommended as they will all have a negative effect on the program progress. Options 2 and 3 would completely set back the program, and reverse the decisions made in 2014 to accelerate the remediation of sewer lateral cross connections across the City. There are many different legislations and regulations aimed at protecting City watercourses and the natural environment, and work with the Ministry of the Environment and Climate Change (MOECC) under the pilot program has helped to focus and support the City's efforts. Ending or limiting the program, as in options 2 and 3 will require Ministry consultation and may have consequences leading to further legal implications.

1. Approve a temporary extension of the FTEs for a period of time

Approving a temporary extension for the FTEs that support the program perpetuates the risk that contract staff will leave for permanent positions elsewhere. Operating a

multifaceted program with temporary staff has the potential for significant reductions in productivity and quality as staff turnaround is expected to be frequent.

2. Revert to previous resource levels and funds (Decelerate Program)

To revert back to the levels prior to September 2015, would cause a considerable reduction in the output of the program and essentially reverse the decision made to accelerate the identification and elimination of cross connections. Coordinating the multiple aspects of the program requires significant staff time dedicated to it. The previous resource level had no staff available to run it on a full time basis. Without having multiple FTEs in place to support the program, there is additional risk of having zero production as a result of illness or staff transitions such as in 2014 and the first half of 2015.

3. Discontinue the program

Discontinuing the program in its entirety and ceasing all effort toward the sewer lateral cross connection problem would likely raise significant concerns from the MOECC who have been monitoring and encouraging the City with regards to the program since the issue was publicized in 2009. Public awareness of the presence of sanitary sewage in City watercourse such as Chedoke Creek has also grown over the years, and this program has a measurable positive impact on addressing the problem.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

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.

Our People and Performance

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

APPENDICES AND SCHEDULES

Appendix A: Sewer Lateral Cross Connection Pilot Program Summary