




# INFORMATION REPORT

<b>TO:</b>	Chair and Members Public Works Committee
<b>COMMITTEE DATE:</b>	October 19, 2020
<b>SUBJECT/REPORT NO:</b>	Feasibility of Accelerated Lead Water Service Line Replacement Options (PW19094(a)) (City Wide) <b>(Outstanding Business List Item)</b>
<b>WARD(S) AFFECTED:</b>	City Wide
<b>PREPARED BY:</b>	Ryan Doyle (905) 546-2424 Ext. 7455
<b>SUBMITTED BY:</b>	Andrew Grice Director, Hamilton Water Public Works Department
<b>SIGNATURE:</b>	

## COUNCIL DIRECTION

At Council's meeting on November 27, 2019, Council approved a motion that directed staff to report back regarding the feasibility of removing lead service water lines from the drinking water system which included:

- (i) Implementation of a by-law to impose the obligation to replace the private portion of lead water service lines where the public portion of a lead water service line replacement has occurred or is to be replaced; and,
- (ii) Options to accelerate the replacement of the public portion of all known lead services inclusive of a financing strategy for the City, with costs estimated to exceed \$100 million.

## INFORMATION

At the November 18, 2019 Public Works Committee staff presented an update on lead in drinking water in Report PW19094, which included updates on the lead water service line replacement program and the corrosion control program. The report highlighted that private lead water service line replacements are completed through both the

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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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substandard water service replacement program as well as coordinated with capital replacement projects. The substandard water service line replacement program is a citizen driven initiative and once a property owner has replaced the private portion of the lead water service line the City of Hamilton (City) will replace the public portion of the water service line. The public portion of lead water service lines are also replaced during watermain and road rehabilitation capital construction projects. However, report PW19094 highlighted that the partial replacement of a lead service does not provide the full benefit to the homeowner and in some cases can temporarily increase the levels of lead in drinking water through the disturbance of lead particles during construction and the interaction of dissimilar metals.

Additionally, report PW19094 highlighted the City's corrosion control program. In 2015, Council approved a phosphate based chemical addition process to control lead in drinking water and the system was fully implemented in November 2018. Community lead sampling as per legislated requirements continues to occur and the corrosion control program has reduced the percentage of samples above the maximum allowable concentration of 10 µg/L for lead in drinking water. Hamilton Water is conducting a pipe analysis study that will provide further insight into the maturity of the program. It should also be noted that Health Canada has revised the guidelines for Canadian Drinking Water Quality with a new maximum allowable concentration for lead of 5 µg/L. The Ministry of Environment, Conservation and Parks, which regulates drinking water in Ontario has not made any changes to reflect the Health Canada guidelines.

In November 2019, Council directed staff to explore the feasibility of program changes to eliminate lead services from the drinking water system. These measures would include by-law changes to mandate private lead water service line replacement if the public portion has been replaced or is to be replaced, greater accessibility to the lead water service line replacement loan program, as well as options to accelerate the substandard water service line replacement program.

On August 21, 2020, Council approved the amendments to the Property Standards By-law (PED20121/FCS20060), requiring the replacement of water supply line(s) on private lands which contain lead.

The remainder of this report is focused on the feasibility of accelerating lead water service line replacements and outlines:

- 1) Outreach, Education and Identification
- 2) Accelerated Program Costing Model
- 3) Staff and Equipment Requirements
- 4) Prequalified Contractor Model
- 5) Lead Water Service Replacement Loan Program

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**1) Outreach, Education and Identification**

The City currently offers a number of resources related to lead in drinking water. These include a dedicated webpage for lead water service line replacements, video instruction for water service line identification, as well as offering free inspections to property owners to help identify water service line type.

Developing a robust database of lead water service line locations is critical to accelerating the replacement program. It is generally accepted in the industry that homes built prior to 1955 were likely to have a lead water service line. This is a key statistic that has been and will continue to be utilized in outreach and education efforts (via water bill inserts, direct property mailings, community advertising, web material etc.), to notify property Owners and Occupants of the potential for their property to have a lead water service line.

Partial lead water services exist in the drinking water system as a result of the coordinated roads and watermain replacement program, or where a lead service has been replaced as the result of an emergency. Staff have identified gaps in the historical records for these situations and are currently working to validate addresses. Once complete additional outreach and education efforts will be required with these properties.

**2) Estimated Accelerated Program Costing Model**

Based on annual averages it will take 25 years to replace an estimated remaining 20,000 lead water service lines in the drinking water system at the current replacement rate. Staff have developed program costs for a 10, 15, and 20 year accelerated replacement strategy which is highlighted in Table 1.

**Table 1 – Blended Contractor and In-House Estimated Cost Model**

Capital Cost for Lead Service Replacement Program Duration (years)	Lead Service Replacement Costs	Municipal Law Enforcement Costs	Annual Cost (\$/year)	Percentage of Services Replaced by in House Crew	Percentage of Services Replaced by Contractor's Crew
10	\$135,889,744	\$1,504,913	\$13,739,466	18.2%	81.8%
15	\$130,689,534	\$1,600,043	\$8,819,306	28.2%	71.8%
20	\$125,393,686	\$1,670,843	\$6,353,227	38.9%	61.1%
25 (Current) Program	\$103,001,250	-	\$4,120,050	0.0%	100.0%

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The cost estimates in Table 1 leverage a mix of internal Staff and Contractors to replace lead water service lines. This is derived from Report FCS19059(b) presented to the Audit, Finance and Administration Committee on December 5, 2019 that recommended an annual savings of \$620,000 per year could be achieved by transitioning some of the substandard water service line replacement program to internal resources. In addition to the costs identified in Table 1 it is also important to consider the requirement for cathodic protection of cast iron watermain. In cast iron watermain the connected lead service water lines act as sacrificial anodes and corrode at a faster rate than the watermain. Accelerated lead water service replacements will require the addition of cathodic protection control which is estimated at approximately \$3 million.

### 3) Additional Staff and Equipment Requirements

This section details the staff and equipment costs associated with an accelerated substandard water service line replacement program. The additional staffing resources are highlighted in Table 2 and are required to provide the following services:

- Outreach and Education
- Administration (permits, scheduling, customer service)
- Construction (size and type inspection, replacements, replacement inspections)
- Enforcement

Table 2 - Additional Staff Requirements by Accelerated Program Duration

Staff Requirements	10 Year Accelerated Program Duration	15 Year Accelerated Program Duration	20 Year Accelerated Program Duration
	Quantity	Quantity	Quantity
Inspector	3.00	1.00	0.00
Water Distribution Operator	6.00	4.00	3.00
Backhoe Operator	1.00	1.00	1.00
Truck Driver	1.00	1.00	1.00
Labourer/Truck Driver	1.00	1.00	1.00
Hydrovactor Operator	1.00	1.00	1.00
Hydrovactor Labourer	1.00	1.00	1.00
Project Manager - Outreach and Education	0.50	0.50	0.50
Admin/Scheduler/Dispatcher	1.5	1.33	1.00
Municipal Law Enforcement Officer	0.5	0.35	0.25
Municipal Law Enforcement Admin Support	0.3	0.2	0.15

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Prosecutor (Tribunal)	0.2	0.15	0.1
Total Additional Staff Requirements	17	12.53	10

For each of the 10, 15, and 20 year accelerated program durations, varying levels staffing are required. At a high-level, Water Distribution Operators, Inspectors, Backhoe Operators, Truck Drivers, Labourers, and Hydrovactor Operators are required for the physical installation of inspection of new water service lines. From an administrative perspective a Scheduler / Dispatcher is required to coordinate appointments with homeowners and organize locate requests while a portion of a Project Manager role is needed to promote the program to increase participation to meet the accelerated delivery model. Furthermore, Municipal Law Enforcement requires staffing for administration and response to non-compliance's by property Owners.

Municipal Law Enforcement efforts were developed on the assumption of a 20% non-compliance rate with the mandatory private lead water service line replacement with a portion of these being appealed to the Property Standards Committee. Municipal Law Enforcement costs were developed for a full cost recovery model where enforcement would be guided by Public Works staff on a case by case basis.

In addition to staffing requirements an accelerated lead water service line replacement program requires additional fleet and construction equipment. The addition of equipment such as: an excavator, dump trucks, hydro excavator, float, enforcement and construction vehicles make up approximately \$4.6 million - \$8.1 million in one-time capital costs depending on the program duration.

#### 4) Prequalified Contractor Model

When considering an accelerated substandard water service line replacement program, the City is exploring the creation of a roster of qualified contractors to perform the private portion of the lead service line replacement. This roster could be provided to property Owners to assist them with the identification and selection of a contractor, and it may reduce the lead time associated with permit application review and approval. This prequalified contractor model is already employed within Hamilton Water to support the Protective Plumbing Program (installation of backwater valves and/or disconnection of downspouts from weeping system), and the Sewer Lateral Management Program.

There are some complexities in developing a fixed price prequalified contractor model for water service line replacements as the prices vary significantly from property to property. Property size, exterior surface features (e.g. grass, asphalt, trees, gardens, fences, porches/patios etc.), and interior features (e.g. finished or unfinished spaces) impact the cost of a water service line replacement. A variable price prequalified contractor model will be explored.

**5) Lead Water Service Replacement Loan Program**

On August 21, 2020, Council approved a new Water and Wastewater Infrastructure Support Community Improvement Project Area and Plan (PED20120 / FCS20055 / PW20047) that incorporates the lead water service replacement loan program. By doing so, loans under this program can be expanded to residential rental properties. This extension of the program supports the replacement of more private lead water service lines, which provides greater accessibility to decreasing the presence of lead in drinking water at the tap.

In May 2020, Council approved amending the lead service replacement loan program to provide access to interest free loans for eligible low-income residential property owners (Report FCS19025(a)). Interest free loans would be granted to property owners of owner-occupied dwellings who have qualified for low-income energy customer programs such as the Low-Income Energy Assistance Program or the Ontario Electricity Support Program.

Lead in drinking water is a major concern for older cities across North America including cities such as Hamilton. The City of Hamilton has robust strategies to control lead in drinking water including an active lead replacement program and a chemical based corrosion control program. As identified previously in this report, Hamilton Water is conducting a pipe analysis study to determine the maturity and effectiveness of the corrosion control program. Additionally, early stages of the corrosion control program has demonstrated reductions in the percentage of lead samples above the maximum allowable concentration of 10 µg/L for lead in drinking water. While lead in drinking water and the health of our residents are a top priority for the City, at this time, the significant operating and capital costs required to accelerate an already successful lead water service replacement program may be better suited for other priorities areas such as the replacement of critical and aging water and wastewater infrastructure.

**APPENDICES AND SCHEDULES ATTACHED**

N/A