



Halifax Regional Water Commission

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June 24, 2019

By Email: friisda@gov.ns.ca

Nova Scotia Utility and Review Board
P.O. Box 1692, Unit "M"
Halifax, NS B3J 3S3

Attention: Doreen Friis, Regulatory Affairs Officer/Clerk

Dear Ms. Friis,

Re: Regulatory Filings for 2018/19

In compliance with previous directions of the Board with respect to annual reporting requirements, we offer the following information in response:

Halifax Regional Water Commission (HRWC) 2018/19 Cost Containment Report

The NSUARB Decision M06540 dated April 14, 2015, at paragraph [62] directed that the cost containment report for the Halifax Regional Water Commission be filed annually, no later than June 30th of each year.

Halifax Regional Water Commission 2018/19 Lead Service Line Replacement Program

The NSUARB Decision M07891 dated August 22, 2017, at paragraph [53] directed that HRWC provide an annual update on the lead service line program progress and costs by June 30th of each year.

Capital Cost Contributions (CCC) Financial Status Information 2018/19 Report

HRWC is obligated to provide an accounting of all funds received and all costs incurred with respect to approved CCC infrastructure improvements.

Attached please find the Cost Containment, Lead Service Line and CCC Financial Status reports for the fiscal year ended March 31, 2019, that were submitted to the HRWC Board on June 20, 2019.

Yours Truly,



Cathie O'Toole
General Manager HRWC

TO: Darlene Fenton, Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: *Original Signed By:*

Reid Campbell, P. Eng., Director Water Services

APPROVED: *Original Signed By:*

Carl Yates, M.A.Sc., P.Eng., General Manager

DATE: June 13, 2019

SUBJECT: **2018/2019 Lead Service Line Replacement Program**

INFORMATION REPORT

ORIGIN

August 22nd, 2017 NSUAR Decision - HRWC Lead Service Line (LSL) Replacement Program (M07891).

BACKGROUND

In October 2016, the Halifax Water Board approved a business plan for a new approach to LSL replacement, consistent with the National Drinking Water Advisory Council (NDWAC) recommendations to the USEPA. On August 22, 2017, the Nova Scotia Utility and Review Board issued an order granting Halifax Water authority to undertake emergency LSL renewals to the water meter at utility cost and to provide a 25% rebate (up to a maximum of \$2500) to homeowners undertaking an LSL replacement. This report will provide an annual update to the Halifax Water Board and the Nova Scotia Utility and Review Board on the LSL replacement program.

Program Overview:

Halifax Water's new approach to manage its customer's exposure to lead is designed to be consistent with the NDWAC recommendations, which have been endorsed by the American Water Works Association, to the degree they can be applied in Canada and do not conflict with local regulatory requirements. The 5 pillars of the new approach and progress made to date are described below:

1) Lead Service Line Inventory

Halifax Water is currently working to consolidate all existing records pertaining to service line composition in an effort to identify all lead service lines. There are 25,851 service connections within the lead boundary area, 17,011 in Halifax (14,459 domestic services where lead could have been used) and 8,840 in Dartmouth. To date, efforts have been focused on the following tasks:

- **Digitizing existing service card records for electronic access;**
There are a total of 17,051 service records that have been identified in Halifax within the existing lead service line boundary. This includes commercial and larger services that are greater than 2 inches which would not have been constructed of lead. As of May 2019, approximately 96 percent of the 17,051 service records have been digitized, while all service records in Dartmouth remain to be digitized. Dartmouth records will be digitized once the existing lead service line boundary is refined in fall 2019.
- **Creating a LSL Information Database:**
In the fall of 2018, Halifax Water's GIS division completed upgrades to Halifax Water's existing drinking water service lateral database (Forms) to allow for lead related information (i.e. replacements, maintenance, inspections, observations, etc.) to be stored and queried. The next phase of this project, began in May 2019, and involves the review of all service records within Halifax Water's existing lead service line boundary to ensure all pertinent information is present for each record. This involves the review of the digital records and comparing them to existing physical records (i.e. service cards, drawings, etc.) and corporate knowledge with the intent of filling any data gaps to facilitate the determination of service line material, with the goal of making the digital record the authoritative source for lateral information, eliminating the need to keep maintaining paper service cards. A term position started working on this project in May 2019 and it is expected to take at least one year to complete records within the west lead boundary.
- **Customer Connect Project:**
As part of the Customer Connect Advanced Metering Infrastructure (AMI) project, staff of our installation contractor, Neptune TG will be inside the premise for each of our approximately 83,000 customers. The AMI project will be used as an opportunity to obtain information on private service material in each home. This data will be incorporated into the digital database as part of the authoritative source determination discussed above. As of May 12th, 2019 there have been a total of 1187 lead service lines identified by meter installation visits. Neptune TG conducted a QA/QC check on a portion of their records and concluded a 90% confidence in their service material identification. With the majority of installations completed within Halifax Water's existing lead service line boundary, it is anticipated that fewer than 100 additional private lead service lines will be identified via the AMI project.

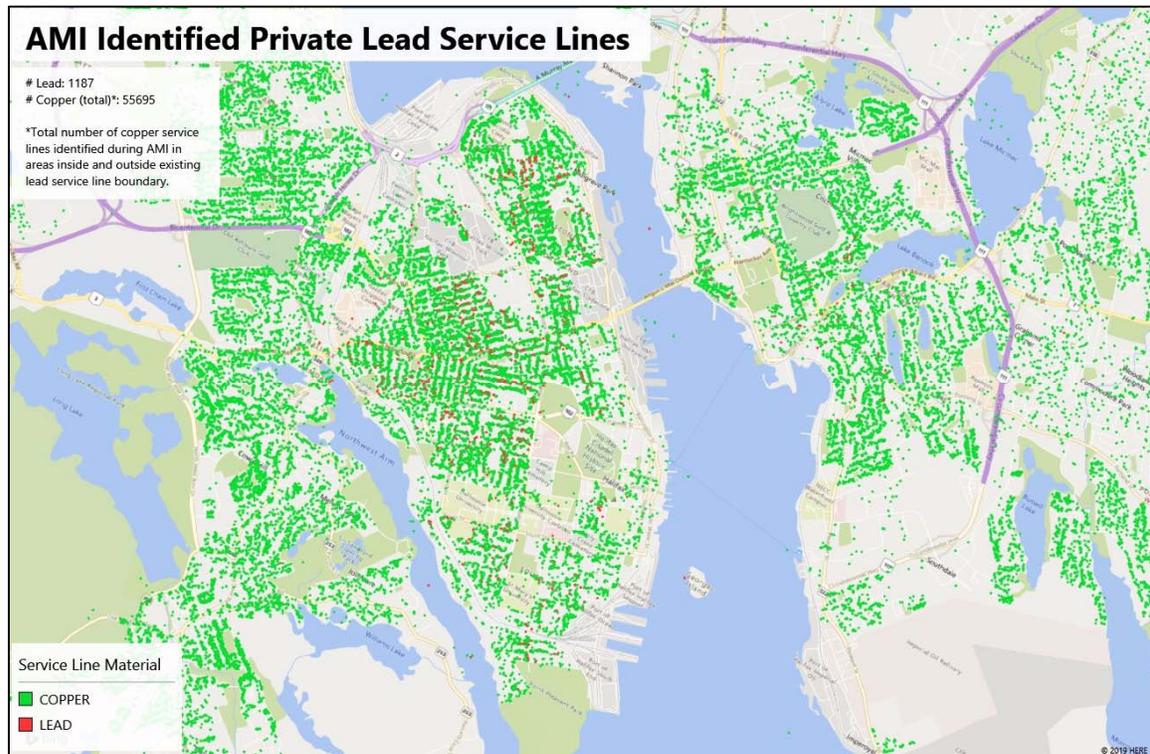


Figure 1 – Lead service lines identified in the home as part of the Customer Connect Advanced Metering Installation project as of May 12, 2019.

2) Lead Service Line Replacement

Halifax Water is working to increase both public and private replacements by:

- Removing barriers to private replacement, which involves informing the public about the health implications of lead service lines, simplifying the process for homeowners, and providing financial assistance mechanisms.
- Engaging in capital projects, meter replacement projects, and HRM paving projects and by increasing overall public engagement.
- Starting this year, Halifax Water is working with HRM to maximize lead service line replacements in conjunction with paving projects. Below are some of the highlights and challenges encountered through this effort to integrate with HRM:
 - Several meetings have been held over the past year with HRM capital project staff to discuss ways of reaching out to homeowners prior to HRM street work and to identify HRM projects for integrating with Halifax Water for lead service line renewal.

- Halifax Water’s policy of not conducting partial replacements for public health reasons poses significant challenges for smooth integration. This is because the replacement of the private portion is often the limiting factor in replacement of the public portion. HRM and Halifax Water would both like to see all public lead services renewed during paving projects. Achieving high levels of customer compliance, however, can be challenging since, if the customer is not motivated to participate for public health reasons, there is no mechanism to compel participation in the integrated project. This can lead to several problematic scenarios:
 - i. The homeowner may decide to renew after paving is complete leading to cuts in new pavement, or
 - ii. There is a missed opportunity for cost savings on large integration projects due to challenges with timing and lack of participation from homeowners.
- With no mechanism or incentive (beyond the standard rebate and loan process) to renew along the timelines of the paving project, integrating with HRM is difficult. To maximize the number of customers who renew with paving projects, further tools are required to incentivize private replacement. Discussions are ongoing internally on mechanisms that can help maximize the number of renewals.
- For the 2019 paving season, Halifax Water has hydro-excavated service boxes for any suspected public lead services where Halifax Water has agreed to integrate with a HRM capital project. A series of letters have been sent out to homeowners in these areas, informing them of their lateral composition and the renewal process in an effort to get commitments prior to paving.
- For the 2020 paving season there are several proposed projects with a significant number of public lead services. Halifax Water is focusing efforts on targeting these projects for integration in the next construction season. This will include hydro-excavating the service box this summer and contacting homeowners with lead services this fall to provide as much advance notice of the project as possible.
- Emergency Full Renewals –There were seven emergency renewals conducted in the 2018/19 fiscal year. Four were the result of a leak on the public service line resulting in a disturbance of a private lead service line. The remaining three were the result of a lead line replacement on the public when records indicated that the private was copper but was found to be lead once excavation began.

- Halifax Water is working to reduce an inventory of approximately 200 customers who have a public lead service line but copper private service line. To make this process more efficient, Halifax Water now hydro-excavates the service box prior to renewal to confirm material, as past practice has shown that sometimes copper is found despite lead being shown on records. This practice reduces costs as it avoids unnecessary excavation and it also eliminates the possibility of creating an emergency renewal as described above.
- Halifax Water implemented the LSL rebate program immediately after the NSUARB Order of August 22, 2018.
 - In the 2017/18 fiscal year, there were 18 customers that took part in this program for a total rebate cost of \$14,108. The mean rebate cost was \$738, with a min and max of \$201 and \$1,565, respectively.
 - In the 2018/2019 fiscal year, there were 105 customer that took park in the program for a total rebate cost of \$102,333.04. The mean rebate cost was \$974, with a min and max of \$143 and \$2,500 respectively.
- Figure 2 shows the number of replacements that have occurred as part of the program since 2011/12. This period encompasses the introduction of authorized contractors to replace the public portion in 2016/17 which allows for the entire LSL to be replaced in a single day, minimizing public health impacts and simplifying the process for the homeowners.

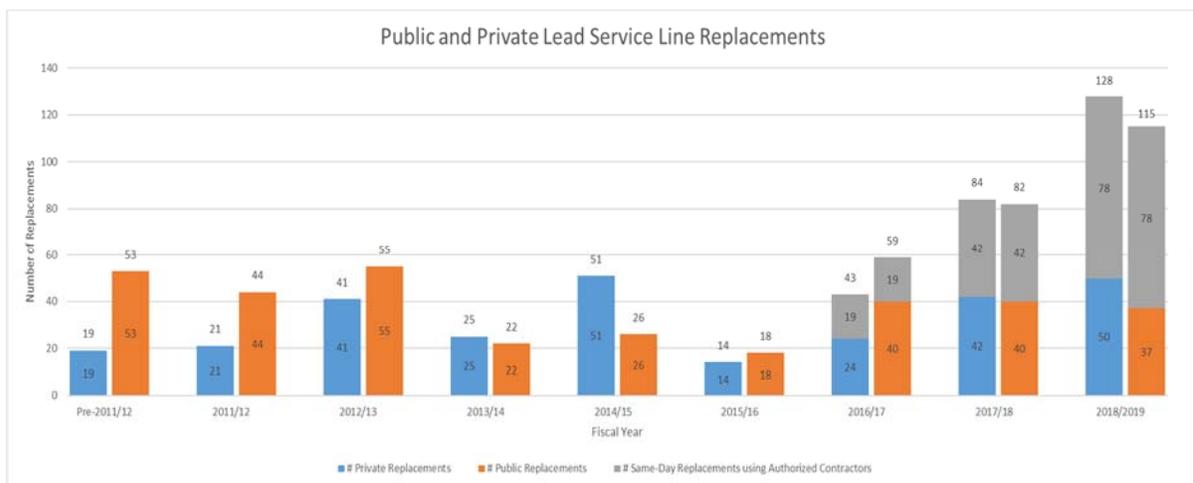


Figure 2 – Number of public (orange) and private (blue) service lines replaced by fiscal year. Grey bars indicate residents who used the same day authorized contractor program to renew both public and private service lines in the same day.

- Historical data prior to 2017/2018 is currently under review to confirm renewal status. For the 2019/2020 report, we expect to see changes in historical renewal numbers due to historical record keeping practices. A new database for storing information in one location has been created. During the review this year, some clerical errors were rectified in the 2017/2018 renewal records resulting in an increase in public and private renewals from last year's report.
- Halifax Water has been exploring the feasibility of lining existing lead service lines as an alternative to replacement. The Water Research Foundation had done a study and determined that there were three technologies that appeared promising. It had been Halifax Water's intent to conduct a pilot study of one or more of these technologies in 2019.
- Halifax Water had been in discussion with a company that held the license for two of the technologies. In January of 2019, this company appears to have abandoned efforts to develop lead service lining as a business opportunity. We have been in contact with a local contractor who has a business relationship the third company. While this company has expressed some interest in doing a pilot project, they have not responded to requests for cost and technical information.
- As a result, we have put plans to conduct a pilot project in abeyance and will monitor market development to look for future opportunities.

3) Public Outreach

Halifax Water is working on increasing customer awareness and engagement in the lead service line replacement program, particularly with respect to health implications of lead and processes for renewal, including the rebate and loan program. The following tasks have been conducted to increase awareness and engagement:

- Upon application by a homeowner for a LSL renewal, they are contacted by program staff. At this time, they are advised of sampling programs, provided with information on the renewal, post renewal maintenance and provided with a National Sanitation Foundation [NSF] certified pitcher filter for temporary use for cooking and drinking during the period of increased lead, post renewal. They are also provided with 7 replacement filters. Filter kits are also provided when Customer Connect installations (see below) require a new or repaired connection on a lead service line.

Table 1 – Number of filter kits provided to residents either as part of LSL replacement or the AMI program in the last two fiscal years.

	2017/18	2018/2019
Number of LSL Renewal Filter Kits Provided	138	157
AMI Filter Kits Provided	2	19

- Halifax Water has created a LSL program brand identity, consistent with Halifax Water’s brand identity. The brand identity is now used on all information and promotion material for the LSL program.
- An improved web page has been created on Halifax Water’s new website, www.halifaxwater.ca.
- Three videos are available to view on the LSL program website. These videos include information on how to test your water for lead, how to identify a lead service line, and how to replace your lead service line.
- A web application allows for customers to determine if they are in the lead boundary area. This application has been posted on the lead website.
- If a lead line is present during meter upgrades as part of the Customer Connect installation, contractor staff leave a letter which informs the customer of line material, provides information on lead and our programs, and provides flushing instructions.
- In the 2018/19 Fiscal year we received 300 lead inquiries from homeowners or tenants. In 2018/19 letters outlining sampling and flushing procedures were replaced with easy to follow instructions to make the process easier for homeowners.

4) Corrosion Control and Water Quality Monitoring

Halifax Water and Dalhousie University continue to conduct research to optimize and monitor corrosion control treatment. Outcomes of research have led to greater effectiveness and reduced cost for corrosion control treatment at both JD Kline and Lake Major treatment plants. Further research is underway into seasonal optimization of corrosion control and the use of less expensive, bulk commodity chemicals for corrosion control. Following is a summary of routine corrosion control sampling.

- **Distribution Coupon Monitoring**

Since 2002 Halifax Water's (HW) water quality group has maintained 10 coupon racks throughout the Pockwock Lake and Lake Major distribution systems. There are six coupon racks in the Pockwock distribution system and four in the Lake Major distribution system. Each rack has a metal coupon for lead, copper, and mild steel, and are sampled quarterly.

- **Distribution Corrosion Control Monitoring**

Corrosion monitoring has been taking place throughout the Pockwock and Lake Major distribution systems since 2004. Parameters measured are alkalinity, aluminum, manganese, iron, zinc, phosphate, o-phosphate, sulphate, turbidity, pH, free chlorine, temperature, conductivity, and oxidation reduction potential (ORP).

- **Lead Rack Monitoring**

In December 2018 Halifax Water began monthly sampling at four "Lead Racks" in our distribution system. Each Lead Rack consists of 4 segments of lead pipe harvested from lead service line renewals, configured to permit sampling of the stagnated water in each pipe running on a 6 hour stagnation cycle. The goal of the lead racks is to be able to monitor full scale response to changes in corrosion control and seasonality of corrosion control. The racks are located in the Halifax and Dartmouth distribution system, in areas where lead service lines are known or suspected to exist. The Halifax racks are currently located in the basement of the N building at Dalhousie and the Robie reservoir chamber. The Dartmouth Racks are located in the MicMac chamber and Park Ave waste water pumping station. Water Quality staff are currently looking into moving the Dalhousie Rack to the waste water pumping station on Barrington St. due to disruptions in water flow to the racks at Dalhousie.

5) Customer Sampling

Halifax Water has several customer sampling programs for lead in drinking water. These programs are outlined below:

- **Customer Request Lead Sampling**

Halifax Water provides complimentary lead testing for customers who have a known or suspected lead service line, and who live in a house built prior to 1960 within the lead service boundary, consistent with Health Canada protocols. Results are sent to the customer once they are available. Figure 3 describes the number of addresses where customer request kits that have been analyzed since 2016. Due to AMI, last year saw repeat samples for several single addresses to track recovery following the creation of a new connection. For the 2018/19 fiscal year 150 sample kits were analyzed for 119 addresses.

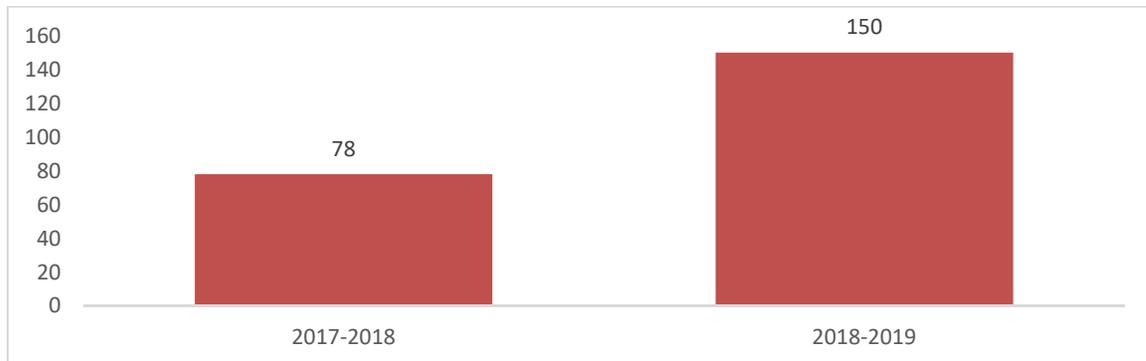


Figure 3 – Customer request lead sample kits analyzed in the last two fiscal year

- **Lead Service Line Replacement Monitoring program**
This program, carried out in conjunction with Dalhousie University, monitors lead levels prior to and after a lead service line replacement. Samples are taken prior to replacement and following replacement at 72 hours, 1, 3, and 6 months. Homeowners are encouraged to participate in the monitoring program following a service line replacement, as it allows them to have a better understanding of the lead levels in their home. When a permit is issued for a private lead service renewal, the homeowner is contacted by email or phone to encourage their participation in the LSL monitoring program and inform them of the Filter Program (see Public Involvement above). In 2018/19, there was a total of 24 LSLR participants and 9 participants associated with the Water Research Foundation 4713. Project [see description below].
- **Annual Health Canada Residential Monitoring Program**
Halifax Water conducts an annual residential sampling program to monitor the effectiveness of the corrosion control program by sampling lead and copper levels in customers' homes throughout the distribution system as per Health Canada protocol. Once per year, 100 homes are tested on a volunteer basis. This program will likely change in 2020/21 in response to recent changes to the Health Canada guideline for lead and anticipated requirements from Nova Scotia Environment which has yet to be released.
- **Water Research Foundation Project 4713**
This project aimed to understand the impacts of, and develop an optimized protocol for conducting high velocity flushing after lead service line replacement to minimize lead exposure. Halifax Water committed to conducting in depth sampling for 10 full service line replacement as a partner in this project; 10 sites were enrolled in the program and 9 sites completed the program requirements. This program is complete and we are awaiting the final report.

- Nova Scotia Environment/Dalhousie University Lead Survey**
 Halifax Water participated in a lead survey conducted last year by Dalhousie University on behalf of Nova Scotia Environment. Halifax Water agreed to arrange for 60 samples along with 6 other communities across Nova Scotia to assess the use of new proposed Health Canada sampling protocols. In total, Halifax Water arranged for sampling at 30 sites in Halifax, and 17 sites in Dartmouth. Despite several mail out recruitment programs, participation in Dartmouth remained low. In total, 42 sites had full analysis. Dalhousie has prepared a report for Halifax Water and the program is completed.

Financial

Table 2 – Summary of money spent on aspects of the lead program from April 1, 2017 to March 31, 2019. Public lead service line replacement is a capital cost and all other costs are operational.

	2017/18	2018/19
Customer Request Lead Sampling	\$4,914	\$13,305
LSL Replacement Monitoring Program	\$12,285	\$14,636
Pitcher Filter Kits	\$10,271	\$11,759
Communications	\$11,900	\$2,607 ¹
Staff	\$148,758	\$228,016
Public Lead Service Line Replacement	\$550,112	\$1,124,473
Lead Service Line Rebate	\$14,107	\$102,333
Total	\$752,347	\$1,497,129

¹ The majority of communications development was done in house in 2018/19.

Summary

Table 3 - Summary of the statistics of the lead program for 2017/2018 and 2018/2019.

	2017/18	2018/19
Public replacements	82 ¹	115
Private replacements	84 ¹	128
Rebates	18	105
Emergency replacements to the meter	2	7 ²
Lead program inquiries	263	300
Filter kits issued	140	158
Customer request lead sample kits analyzed	78	150
	Average cost	Average cost
Public replacement	\$8,067 ⁴	\$11,468 ³
Private replacement (based on rebates)	\$3,188	\$3,940
Rebate	\$738	\$974.00
Emergency replacement	\$14,860	\$11,413.45 ²

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	Total Cost	Total Cost
Public replacement	\$550,112	\$1,124,473
Private replacement	\$88,318	\$429,529.26
Rebate	\$14,108	\$102,333
Emergency replacement	\$29,720	\$79,894.18

- ¹ Numbers are different than report provided to UARB in 2018 due to review of historical records.
- ² One renewal was the result of issues encountered during an AMI meter replacement. Neptune covered the cost of the renewal therefore the cost is not included in this table.
- ³ Based on review of 70 contractor invoices.
- ⁴ Based on review of 48 contractor invoices.

Report Prepared by: <i>Original Signed By:</i> _____ Wendy Krkosek, Water Quality Manager, 902-483-4432
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