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Management of Lead Service Line Replacements

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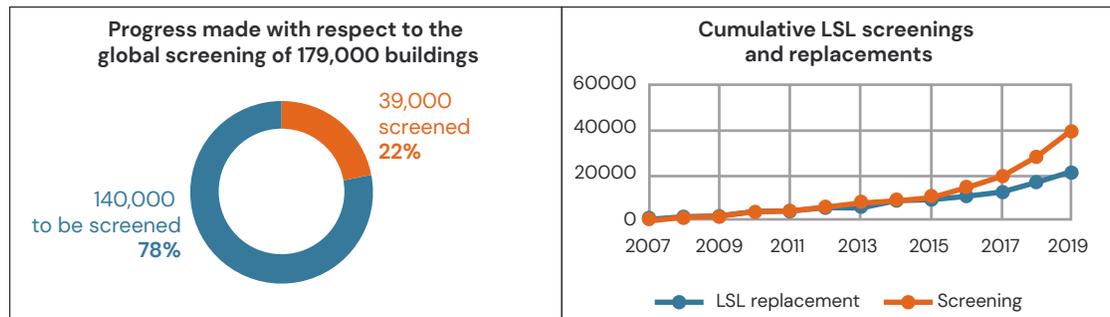
Auditor General of the Ville de Montréal

Management of Lead Service Line Replacements

Background

In 2007, in order to meet the government's drinking water quality and public health requirements regarding lead in drinking water, the Ville de Montréal (the City) filed a plan to replace all lead service lines (LSLs), which called for the elimination of all LSLs (estimated in number at 69,000) by 2026. In 2019, in response to Health Canada's change in the standard for the allowable concentration of lead in drinking water, and at the request of the Québec government, the City tabled a revised Action Plan (AP) to eliminate all LSLs by 2030. This revised plan provides for new actions, including accelerated screening. Lead is a metal known to have harmful effects on human health.

It is estimated that, as of December 31, 2019, approximately 21,000 of the 69,000 LSLs had been replaced. Between 2007 and January 2020, close to 39,000 buildings were tested. The 2019 AP calls for the screening of another 100,000 buildings. However, this number has increased considerably since the revised AP was approved, to reach somewhere around 140,000 buildings. In addition, there are approximately 21,000 buildings for which the public section of the LSL has been replaced and that need to undergo an analysis to determine whether there are any LSLs in the private section.



Purpose of the Audit

The purpose of our audit was to ensure that the implementation of the lead service line replacement (LSLR) activities is progressing in accordance with the 2007 AP that was revised in 2019 and that the municipal by laws regarding replacement work are being enforced as intended.

Results

While the initial AP was approved in 2007 by the Québec government, we note that the information available on the progress of the elimination of LSLs does not provide us with an overall picture of the situation that could be used to make informed decisions and to properly inform the public. Thus, we note that the replacement of LSLs has not progressed as planned in the AP. In addition, we did not find evidence that the regulations respecting the elimination of LSLs were systematically applied as required. In order to fully implement the AP, considerable work remains to be done and, as a result, the City must review existing management practices to accelerate the pace of LSL screening and replacement activities.

Main Findings

Roles and Responsibilities

- The roles and responsibilities of the various stakeholders involved in LSL screening and replacement operations have not all been clearly defined, communicated and implemented.

Implementation of the Action Plan

- The 2019 revised AP has not been updated to incorporate all relevant sectors of activity and new data to ensure that all LSLs are eliminated and that the health risks to the population exposed to LSLs are controlled.
- Not all of the activities provided for in the AP were accompanied by more specific timelines, targets and indicators, and not all of them were subject to periodic performance evaluations as part of the implementation of the AP, in order to make the required adjustments, if necessary.

Follow-up of the Implementation

- The monitoring mechanisms in place are not sufficient, causing problems in the collection, compilation and validation of data, particularly concerning LSLR operations. This poses a risk regarding the reliability and exhaustiveness of the data.

Monitoring of the Application of the Regulations

- The monitoring mechanisms in place do not provide the assurance that the adopted regulations and guidelines have been applied.

Means Used to Communicate with Citizens

- The interactive map and website do not provide information to citizens about the replacement of LSLs or about the progress of AP activities overall.

Accountability

- There is no reporting system to periodically and formally inform the elected officials and the managers concerned about progress with respect to the implementation of the AP.

In addition to these results, we have made various recommendations to the business units, which are presented in the following pages. These business units were given the opportunity to agree to the recommendations.

List of Acronyms

AP	Action Plan
CC	city council
CDN-NDG	Côte-des-Neiges– Notre-Dame-de-Grâce borough
DRSP	Direction régionale de santé publique
L	litre
LSLR	lead service line replacement
LSLs	lead service lines
m	metre
MDDEP	Ministère du Développement durable, de l'Environnement et des Parcs
MELCC	Ministère de l'Environnement et de la Lutte contre les changements climatiques
MHM	Mercier–Hochelaga–Maisonneuve borough
µg/L	micrograms per litre
PRR	<i>Programme de réfection routière</i>
SE	Service de l'eau
SF	Service des finances



Table of Contents

1. Background	167
2. Purpose and Scope of the Audit	171
3. Audit Results	172
3.1. Roles and Responsibilities	172
3.2. Implementation of the Action Plan	175
3.2.1. Implementation	175
3.2.2. Timetables, Targets, Indicators and Progress Assessment	180
3.3. Monitoring the Implementation of the Action Plan	183
3.3.1. Monitoring the Action Plan	183
3.3.2. Data Collection, Compilation and Validation	184
3.3.3. Monitoring Regulations and Guidelines	187
3.4. Means Used to Communicate with Citizens	190
3.5. Accountability	193

4. Conclusion	195
5. Appendices	197
5.1. Objective and Evaluation Criteria	197
5.2. Illustration of a Service Line (Public and Private Sections)	198

1. Background

It is recognized that lead service line pipes are usually the most significant source of lead in drinking water. Since lead was considered an acceptable material in the manufacturing of pipes that supplied water to homes until 1975, there is a risk that lead will gradually be released into the water, thus exposing those who consume the water containing this contaminant.

The drinking water distributed by the municipal water system on the territory of the Ville de Montréal (the City) is of excellent quality. However, some buildings are supplied by a lead water line. The lead can dissolve and end up in the water, especially after long periods of stagnation. In this situation, there is a risk that the concentration of lead in the tap water will exceed the regulatory threshold.

The service lines are connected to the secondary water system. They are mainly located under the streets, connected to the secondary pipes and made up of a public section (for which the City is responsible) and a private section (for which the owner is responsible). This is the underground pipe that connects a building's system to the water system network. Appendix 5.2. of this report provides an illustration of these two sections connected to the secondary system pipe.

Service lines can be more than 95% lead-based (referred to as a lead service line [LSL¹]), significantly exposing building occupants to a source of lead. Moreover, according to the Ministère de la Santé du Québec,² the issue of lead in the water on the Montréal territory is mainly associated with the presence of LSLs, which makes this situation a public health issue. Lead is a metal known to have harmful effects on human health. It can have a variety of health consequences, including:

- damaging multiple organ systems in various ways;
- affecting the health of infants and children under six years of age by hindering their intellectual development;
- affecting the fetus of pregnant women;
- affecting cardiovascular health and causing renal dysfunction in adults.

¹ A service line has a public section, which the Ville de Montréal is responsible for maintaining or replacing, and a private section, which is the responsibility of the building's owner.

² Gouvernement du Québec, Ministère de la Santé et des Services sociaux, Direction régionale de santé publique de Montréal.

Lead was banned in 1980, eliminating its use in LSLs and making way for other materials, such as copper, for piping. Although efforts have been made to reduce lead exposure in recent decades, there are still a number of LSLs left on the City's territory. According to the Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC), it is possible that LSLs were installed as late as 1967 in the Montréal area. On the Montréal territory, the buildings with the highest probability of being supplied by an LSL are:

- buildings with 8 dwellings or fewer built before 1970;
- buildings constructed between 1940 and 1950, commonly referred to as "wartime housing".

According to the City's estimates, there are LSLs present in 16 of the 19 boroughs. In the boroughs of L'Île-Bizard–Sainte-Geneviève, Pierrefonds–Roxboro and Saint-Léonard, it is very unlikely to find LSLs, as the buildings in these boroughs were built more recently.

In 2004, after conducting its first lead sampling program, the City found that 69% of post-war homes had lead concentrations in their drinking water that exceeded the federal and provincial standards of 10 micrograms per litre (µg/L). To remedy the situation, the City developed an Action Plan (AP) that included the elimination of LSLs over a 20-year period as part of its secondary water main replacement program.³ The goal of the AP was to eliminate, by 2026, the approximately 69,000 LSLs that were still present in the City according to another sampling program in 2006. The AP was approved in February 2007 by the Ministère du Développement durable, de l'Environnement et des Parcs (MDDEP).⁴

In 2013, to enable the boroughs to replace LSLs, city council (CC) delegated lead service line replacement (LSLR) to the boroughs by by-law⁵ as part of their local *Programme de réfection routière* (PRR) during complete reconstruction work of road infrastructure.

³ This is the local water system in the neighbourhoods that supplies the buildings with drinking water.

⁴ Decision-making record no. 1070593002, Ville de Montréal – MDDEP letter dated February 23, 2007.

⁵ *Règlement intérieur de la Ville sur la délégation de pouvoirs du conseil de la Ville aux conseils d'arrondissement*, city council, *By-law 02-002* adopted December 18, 2001, section 1, paragraph 4.1. One of the *By-law's* objectives is to streamline the procedure for approvals by City officials. Since the replacement of the LSLs is under the jurisdiction of CC, the delegation of authority to the borough councils will make it possible to reduce the time required to obtain the approval of City officials, since the borough council will be able to give its approval.

In the context of reviewing a by-law,⁶ the Commission permanente sur l'eau, l'environnement, le développement durable et les grands parcs (hereinafter the Commission) produced a report in 2014 that touched on the LSL issue, in which it mentioned that in total:

[TRANSLATION] "5,250 public-section water lines were replaced, 250 of which were in wartime housing. It was indicated that few citizens have performed the replacement of their section [private] of the line, resulting in a partial replacement configuration (Pb private/Cu public) in the case of 50% of the replacements performed by the City."⁷

The Commission made a number of recommendations, including achieving the objectives of the AP approved in 2007, accelerating the *Programme de remplacement de la section publique des entrées de service en plomb* and accelerating LSLR activities (with respect to private sections) using different approaches. As a result, starting in 2016, the City entered into partnership agreements to accelerate LSL screening and enable testing. Since 2008, 39,000 buildings have been tested.

To accelerate LSLR activities with respect to private sections (located on citizens' property), CC adopted a *By-law*⁸ in 2017 allowing it to replace the private sections of service lines. However, this by-law is only applicable in cases where a building's wall is located within a distance of 1.5 metre (m) of the public sidewalk. Prior to the adoption of this by-law, the City only replaced the public section of LSLs, leaving the decision to replace the private section up to the owner. The Service de l'eau (SE) then adopted directives for the boroughs and departments involved to speed up the LSLR work, particularly during certain roadworks.

⁶ *Règlement sur la canalisation de l'eau potable, des eaux usées et des eaux pluviales (chapter C-1.1 of the Règlement refondu de l'ancienne Ville de Montréal)*, city council, effective August 24, 2001.

⁷ Decision-making record no. 1144527002, Ville de Montréal.

⁸ *Règlement relatif au remplacement par la Ville de la section privée des entrées de service d'eau en plomb*, city council of the Ville de Montréal, *By-law 17 078* adopted August 21, 2017. The main objective in adopting the new by-law is to preserve municipal infrastructure and to harmonize practices throughout the City.

In March 2019, Health Canada lowered the guideline for the acceptable concentration of lead in drinking water from 10 µg/L to 5 µg/L – one of the most stringent standards in the world. In October 2019, the Québec government announced that it would amend its regulations to comply with this new Canadian guideline and, at the same time, change the sampling procedures for lead in drinking water. In doing so, it asked Québec municipalities to develop an AP to reduce lead in drinking water, following Health Canada’s recommendations. Thus, each municipality must cover the following points in its AP:

- areas of the municipality where buildings are likely to have an LSL;
- a timeline for identifying these areas;
- the period required to replace all LSLs on its territory;
- the cost of the process;
- the establishment of work priorities.

As a result, the City revised its 2007 AP and has a revised AP that will enable it to eliminate all LSLs on its territory by 2030. This revised AP, which was approved by the Québec government on October 11, 2019, and by the Direction régionale de santé publique (DRSP) on October 15, 2019, includes the following 6 actions:

- make an online map available to citizens to view information about the presence of lead in their building;
- accelerate screening to accurately locate all LSLs on the territory. The City will have tested tap water in approximately 100,000 buildings by 2022, with priority given to buildings housing family daycare and childcare centres, single-family homes, duplexes and triplexes;
- provide a filtration device at the time of screening when the presence of an LSL is confirmed;
- continue to accelerate the replacement of public-section LSLs. The City will have replaced all LSLs (approximately 48,000) by 2030;
- make the replacement of the private section of LSLs mandatory;
- prioritize the replacement of LSLs in wartime housing, single-family dwellings, duplexes and triplexes.

The 2020 budget that was approved by the City’s executive committee in November 2019 provides a total of \$557 million in investments that are planned over a 10-year period for the implementation of the *Programme de remplacement des entrées de service* in order to accelerate the implementation of the program and thus meet the recommendations issued by Health Canada in connection with the new standard for lead concentration in drinking water (5 µg/L).

Since December 2019 in particular, the SE has made a change in its organizational structure in order to organize its teams to deal with LSL screening, inspection and replacement operations in particular.

As of December 31, 2019, according to the City's estimate, approximately 21,000 LSLs had been replaced out of the total 69,000 LSLs estimated in 2007.

The boroughs of Côte-des-Neiges–Notre-Dame-de-Grâce (CDN-NDG) and Mercier–Hochelaga–Maisonnette (MHM) are among the boroughs that were particularly concerned by the LSLR. As of December 31, 2019, these two boroughs had the most LSLRs, i.e., 2,822 and 2,621, respectively.

2. Purpose and Scope of the Audit

Under the provisions of the *Cities and Towns Act* (CTA), we completed a value-for-money audit mission on the management of lead service line replacements. We performed this mission in accordance with the *Canadian Standard on Assurance Engagement* (CSAE) 3001, described in the *CPA Canada Handbook – Certification*.

The objective of our audit was to ensure that the implementation of the LSLR is progressing in accordance with the 2007 AP that was revised in 2019 and that the municipal regulations regarding replacement work are being enforced as intended.

The role of the Auditor General of the Ville de Montréal is to provide a conclusion regarding the objectives of the audit. To do so, we collected a sufficient amount of relevant evidence on which to base our conclusion and to obtain a reasonable level of assurance. Our assessment is based on criteria we have deemed valid for the purposes of this audit. They are presented in Appendix 5.1.

The Auditor General of the Ville de Montréal applies *Canadian Standard on Quality Control* (CSQC) 1 from the *CPA Canada Handbook – Certification* and, accordingly, maintains a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements. In addition, it complies with the independence and other ethical requirements of the *Code of ethics of chartered professional accountants*, which are founded on fundamental principles of integrity, professional competence and due diligence, confidentiality and professional conduct.

Our audit focused on the period from the approval of the City's 2007 AP by the Québec government, in February 2007, to February 28, 2020. However, for certain aspects, data from before and after this period were also taken into consideration. Our work was mainly carried out between March 2020 and January 2021. We also took into account information that was sent to us up to March 2021.

Most of the work was carried out within the following business units:

- the Service de l'eau;
- the Côte-des-Neiges–Notre-Dame-de-Grâce borough;
- the Mercier–Hochelaga–Maisonnette borough.

At the end of our work, a draft audit report was presented for discussion to the relevant managers in each of the audited business units. The final report was then sent to the management of each of the business units concerned to obtain an AP and a timeline for implementing the recommendations concerning them, as well as to the director general, the deputy director-general, Mobilité et attractivité, the deputy director-general of the Service aux citoyens and the director of the Service de concertation des arrondissements.

A copy of the final report was also sent, for information purposes, to the directors of the boroughs not directly concerned by our audit work to enable them to implement the recommendations where the situation warrants it.

3. Audit Results

3.1. Roles and Responsibilities

Several parties are involved in the screening and replacement of lead service lines (LSLs) necessary to implement the AP to eliminate LSLs. Table 1 summarizes the roles and responsibilities of the different business units audited.

Given the City's administrative structure, core activities such as implementation of the AP and communication with other levels of government are carried out by the SE. It also performs the vast majority of LSL screening operations and planning for LSLR work. In 2017 and subsequent years, the SE produced guidelines asking boroughs to accelerate their LSLR operations across a range of roadwork categories.

In the boroughs, we note a difference in screening operations, where the CDN-NDG borough has been conducting some screening operations since 2018, in contrast to the MHM borough, which has not. Both boroughs, however, are involved in issuing contracts for LSLR work.

For water fountains in parks and in municipal buildings,⁹ the SE considers that screening and replacement of LSLs is mainly the responsibility of the boroughs or of the Service des grands parcs, du Mont-Royal et des sports or of the Service de la gestion et de la planification des immeubles, depending on the type of park. Although the SE is not specifically responsible for LSLR activities involving water fountains, it nevertheless provides support to the boroughs and these central departments, including preparing screening protocols and providing testing equipment and training. However, in the two audited boroughs, no screening work¹⁰ related to water fountains in parks has yet been undertaken because the information

⁹ The water fountains in the City's parks and municipal buildings may contain lead, including in service lines.

¹⁰ The SE had tested 333 water fountains during the summer of 2019. However, in June 2020 a memo was sent to the boroughs with a new testing protocol attached, so that all water fountains would be tested including those that had already been tested in 2019. During the summer of 2020, the MHM, Lachine and LaSalle boroughs tested nearly sixty water fountains.

obtained from the SE to do so dates back to the spring of 2020 and no guidelines regarding the activities to be carried out for replacing these water fountains' LSLs have been communicated to them so far.

We therefore note a discrepancy in the roles played by the boroughs in detecting LSLs. This is due to the fact that there is no complete and accurate documentation in either AP (2007 and 2009 versions) to define all of the roles and responsibilities of the parties involved in the elimination of LSLs. Also, there is a grey area as to who is actually responsible for LSL screening and replacement operations for the water fountains in the City's parks. This grey area is due to the fact that this source of lead exposure in parks was never addressed in the 2007 AP nor in its revised version in 2019.

The fact that roles and responsibilities are not clearly defined for all of the activities relating to the elimination of LSLs does not facilitate their communication and creates a risk that responsibilities may not be assumed for activities or assets that are affected by the elimination of LSLs.

TABLE 1

Roles and Responsibilities of the Audited Business Units in the Elimination of Lead Service Lines

Activities	Service de l'eau	Boroughs	
		Côte-des-Neiges-Notre-Dame-de-Grâce	Mercier-Hochelaga-Maisonneuve
Interlocutor for the Ville de Montréal with the Ministère de l'Environnement et de la Lutte contre les changements climatiques and the Direction régionale de santé publique	Self-assigned due to the department's activities	None	None
Implementation of the Action Plan		Participation	Participation
Screening		A little since 2018	None
Lead service line replacements	Planning of the replacements	Awarding of contracts for the work	Awarding of contracts for the work
Water fountains in the parks	Screening	Support to the boroughs and performance of part of screening operations	None
	Lead service line replacements	None	None

3.1.A. Recommendation

We recommend that the Service de l'eau ensure that the roles and responsibilities of all relevant stakeholders are clearly defined, documented, communicated and approved by the Direction générale to facilitate enforcement and to promote effective implementation of the Action Plan for eliminating lead service lines.

3.2. Implementation of the Action Plan

3.2.1. Implementation

Since screening operations began, 39,000 buildings have been tested (see Table 2). The AP that was revised in 2019 and approved by the MELCC and the DRSP called for screening 100,000 buildings (see Table 3). However, our audit work revealed that, once the AP had been approved, the number of buildings to be tested and analyzed increased for the following two reasons (see Table 3):

- Firstly, because it could not explain why approximately 40,000¹¹ buildings had been identified as not having LSLs in a real estate assessment roll review at the time, the SE was forced to reconsider them as buildings to be tested.
- Secondly, approximately 21,000 buildings are to undergo an analysis even though, since 2007, the public section of the LSL has been replaced, because the City does not know whether the private section of the ESP is made of lead and, if so, whether it has also been replaced. Indeed, when the public sections of LSLs were replaced, few citizens replaced their portion. According to the SE personnel with whom we met, based on visual observations of part of the private sections of LSLs during work to replace the public sections, approximately 35% of these 21,000 service lines may contain lead, which represents a significant number of buildings. In addition, it is only since 2018 that the City also replaces the private section when it replaces the public section, provided that the building is located within 1.5 m of the sidewalk.

TABLE 2

Number of Buildings Tested Since 2007

Between 2007 and 2016	2017	2018	2019	Total as of December 31, 2019
13,396	4,922	8,889	11,547	38,754

Source: Ville de Montréal, Service de l'eau.

In the original AP, as in the revised version, the SE estimates that 69,000 LSLs need to be replaced on the City's territory (see Table 3). At the end of 2019, still according to the AP, 48,000 LSLs were to be replaced, i.e., close to 70% of the original target. However, considering that the service lines of about 40,000 additional buildings are to be tested, a situation subsequent to the revised AP, the estimate of the number of LSLRs in the revised AP should be reviewed and confirmed.

¹¹ The figure of 40,000 buildings to be screened is still under review and is subject to change.

TABLE 3

2019 Action Plan Objectives and Status of Lead Service Line Screening and Replacement

2019 Action Plan Objective	Status
Screening component	
100,000 buildings to be tested by 2022	Close to 39,000 LSLs screened as of January 24, 2020. 100,000 buildings to be tested (included in the 2019 Action Plan).
	Approximately 40,000 new buildings to be tested (not included in the Action Plan and discovered in 2019 once the Action Plan approved).
	Approximately 21,000 buildings – analysis to be done (identification of lead service lines in the private section due to the public section having been replaced).
	No mention of screening in the Action Plan for water fountains in parks.
Replacement component	
Replacement of 69,000 lead service lines by 2030	Estimated 21,000 ESPs replaced between 2007 and December 31, 2019.
	Water fountain lead service lines to be replaced: unknown number (not included in the 2019 Action Plan).
	As of December 31, 2019: estimated 48,000 public-portion lead service lines to be replaced pursuant to the Action Plan (including 16,800 private-section lead service lines to be replaced by the City [estimate as of October 23, 2019]).
	As of October 23, 2019: Replacements required in 154 “post-war” buildings.
	No mention in the Action Plan of replacing the lead service lines of the water fountains in the parks. The winter 2020 communication plan in connection with the replacement of lead service lines states “ <i>Plan d’action pour les fontaines et les bâtiments municipaux encore inconnu</i> ”.

Source of the figures: 2007 Action Plan, 2019 Action Plan and Service de l’eau, Ville de Montréal.

Considering that less than two years after the approval of the revised AP, additional work has already been identified for screening and for water fountains in the parks and that this will most certainly have an impact on LSLRs, it seems essential to us that the AP be updated again.

Since 2007, in addition to the APs, the SE has adopted various strategies to achieve and accelerate the replacement of LSLs, including the following:

- 2007: LSLRs carried out during the reconstruction of drinking water lateral mains;
- 2008: LSLRs added during the rehabilitation of drinking water mains;
- 2013: CC adopts regulation to delegate LSLR operations to the boroughs in the event of complete reconstruction of the road infrastructure within the framework of the local PRR;
- 2016: One-off contracts concluded (also called LSLR contracts) dedicated to LSLRs following requests from citizens and for “post-war” buildings;
- 2017: Guidelines issued by the SE to the boroughs and departments concerned for LSLR during road reconstruction or pulvo-stabilization contracts¹² and contracts involving the reconstruction of more than 50% of the sidewalks;
- 2018: Memorandum issued by the SE to recommend that boroughs replace LSLs during pavement resurfacing work;
- 2018: CC adopts a by-law for the City to replace, at the owners’ expense, the private section in the case of buildings located within 1.5 m of the sidewalk.

Despite the use of these different strategies since 2007—and especially since 2016—there remains a great deal of work to be done in order to comply with the provisions of the AP in terms of LSL screening and replacement. Since 2007, LSLR operations have not evolved in a sufficiently sustained manner. It is only since 2017, i.e., 10 years after the AP began to be implemented, that LSLR operations have accelerated (see Table 4). Yet, although the SE has been encouraging the boroughs to replace LSLs through guidelines and memorandums since 2017, it is only recently that the two audited boroughs have accelerated LSLR operations.

¹² The pulvo-stabilization technique consists of scarifying the pavement and mixing it in with the underlying aggregate in a single operation. A binding agent is injected in order to obtain a reinforced foundation with the materials present on site.

TABLE 4

Number of Lead Service Lines Replaced Since 2007 (and Before)

2007 and before	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 estimé	Total
304 (822 before 2007)	758	869	583	257	1,245	511	1,787	1,482	1,407	2,244	4,449	4,669	21,387

While the SE has resorted to a host of strategies over the years to accelerate LSLRs, we have not been able to track down any documented evaluation of the contracts and works as a whole to determine which ones require the involvement of the boroughs, are more conducive to LSLRs and have the least impact on the boroughs’ assets. Nor did we find any documented analysis that examines whether the replacement prescribed and proposed in the directives and memorandums, within the framework of the various works, for example concerning the contracts identified as “LSLR,” is harmonized with the by-laws respecting LSLRs, notably *Règlement O2-002 sur la délégation de pouvoirs du conseil de la Ville aux conseils d’arrondissement*, which could create some sort of confusion or lack of understanding of the approach that the boroughs are required to follow.

One of the activities provided for in the 2019 AP is to “[TRANSLATION] mandate the replacement of the private section of lead service lines.” The City currently has an issue with the private sections of LSLs for which the public section has already been replaced. No strategy has been communicated to the citizens in that respect to date, and there are approximately 21,000 buildings for which the City must conduct an analysis to determine the status of the private section of the service line for which it has already replaced the public section. As mentioned previously, the SE estimates that the private section of up to 35% of these service lines could be made of lead, i.e., nearly double the number of LSLs replaced by the City in 2019. Since the replacement of the public sections for these 21,000 buildings has been completed, replacing the private sections is now the citizens’ responsibility. They will have to carry out the required work at their own expense. It is therefore important that a strategy be developed to guide the deployment of this activity provided for in the 2019 AP and that it be issued in such a way that citizens understand all of the issues (e.g., health risk, notice of infraction if the replacement is not done) that will affect them in the event that the presence of an LSL has been confirmed on their property.

At the time the revised AP was approved in October 2019, the DRSP had requested that the City provide

[TRANSLATION] “...temporary protection measures for the citizens concerned until their LSL has been replaced in full, in order to reduce financial barriers to the application of these voluntary measures with a view to reducing social inequalities with respect to health. Such measures would be particularly relevant for pregnant women, infants and young children but would also reduce risks for the rest of the population.”

The SE had committed in its AP to respond to this request from the DRSP by implementing additional mitigation measures, including the distribution of water jugs, filters and other filtration devices, as of October 23, 2019, to citizens as well as daycare centres having tested positive. At the time of our audit, these filtration devices had not yet been distributed to all categories of citizens affected by a positive screening. Only 321 water jugs had been distributed out of 564 jugs requested as of May 2020 by low-income individuals eligible for the temporary mitigation measures. As of July 2020, the personnel responsible for the delivery of these devices had not yet been fully hired to ensure the distribution to the remaining affected population.

Also at the time the revised AP was approved, the MELCC, like the DRSP, had made various recommendations to the City, including:

[TRANSLATION] "...list all non-replaced private service lines, record them in a publicly accessible database, and ensure the execution of the work to be completed."

To this effect, the City makes an interactive map available to citizens on its website. However, a review of this map showed that it does not yet include the replacement work or the private LSLs replaced and therefore does not provide accurate and up-to-date information to citizens.

It is important that the SE take these recommendations made by the DRSP and the MELCC into consideration as part of the AP and see to their implementation. The City, in filing its AP with the DRSP and the MELCC, has made the commitment to the Québec government to eliminate LSLs. The additional recommendations made by the DRSP and the MELCC further demonstrate the importance of eliminating LSLs for public health reasons.

3.2.1.A. Recommendation

We recommend that the Service de l'eau, in collaboration with all of the boroughs concerned, revise the Action Plan so that it includes all the aspects related to the elimination of lead service lines, as well as new data concerning the number of tests to be performed, and that it take into consideration the recommendations of the Direction régionale de santé publique and of the Ministère de l'Environnement et de la Lutte contre les changements climatiques. We also recommend that it determine the most appropriate strategy to accelerate the screening and replacement of lead service lines, with a view to meeting the 2030 deadline.

3.2.1.B. Recommendation

We recommend that the Service de l'eau, in collaboration with all the boroughs concerned, provide a framework for the deployment of the various steps to be carried out pursuant to the obligation for citizens to replace the private section of their lead service line for which the public section has been replaced, the goal being to ensure that citizens understand all the issues affecting them when the presence of a lead service line has been confirmed.

3.2.1.C. Recommendation

We recommend that the Service de l'eau complete the implementation of the recommendation in the Action Plan concerning mitigation measures and evaluate the effectiveness of these measures in order to adjust them as needed to reduce public health risks.

3.2.2. Timetables, Targets, Indicators and Progress Assessment

Timetables

An overall timetable for the elimination of LSLs by 2026 was established in the 2007 AP. In the revised 2019 AP, the target date was changed to 2030. In addition, while the 2007 AP did not include a specific timetable for screening, the 2019 AP has one to ensure that accelerated screening for the remaining 100,000 buildings is completed by 2022. However, since this revised AP was adopted, the number of required screenings has increased to approximately 140,000, which raises questions about how realistic this specific timetable is. In addition to this, there is also the work of analyzing the private section of the 21,000 service lines for which the public section has already been replaced by the City.

While a specific timetable has been established for screening, no date is specified for the completion of several other operations in the revised AP. Thus no specific timetable has been set for:

- inserting replacement data in the interactive map made available to citizens;
- implementing protective and mitigating measures (e.g., water jugs);
- replacing the LSLs of single-family homes, triplexes and duplexes, including daycare centres, on a priority basis.

As with screening, we believe it is important that specific timetables be established for these activities. For example, updating the interactive map is an activity that must be carried out as quickly as possible in order to inform citizens about the required replacement or not of their building's LSL. The MELCC recommended that the City establish a registry of non-replaced LSLs for the purpose of informing the public.

A specific timetable for screening is important since replacement work is planned accordingly. The sooner all buildings are tested, the easier it will be to plan LSLR operations. It is therefore important that the screening timetable be reviewed in light

of the new number of buildings to be tested. A detailed timetable would allow for better monitoring of the progress made with respect to each of these activities while providing a clearer picture of what has been achieved and what has not.

Targets

The revised AP aims to conduct approximately 33,000 screenings per year in order to reach the goal of 100,000 buildings tested by 2022. Considering that the number of buildings to be tested has since increased to approximately 140,000, this target is no longer adequate unless the timetable is adjusted. Furthermore, to meet the goal of replacing 48,000 LSLs by 2030, the revised AP aims to replace approximately 5,000 LSLs per year. These are the only two targets in the revised AP that can help the SE set a certain pace to meet its targets by the given deadline. No target has been set for the other activities in the revised AP, including:

- replacing the LSLs of priority buildings (e.g., single-family homes, triplexes and duplexes, and daycare centres);
- the City replacing the private section of LSLs (on citizens' property);
- citizens replacing the private section of their LSL (mandatory measures) in cases where the City did not replace the private section when the public section was replaced.

As with the screening and replacement of LSLs, we believe it is important that specific timetables be established for these activities. This would allow for more detailed monitoring of the progress made on each of these activities while providing a tool to measure the results of the interventions.

Indicators

The SE has developed indicators to assess the results of activities relating to screening and the distribution of water jugs. Nevertheless, at the time of our audit, we were unable to track indicators to assess progress in achieving targets for the following activities:

- compiling or updating the interactive map;
- the City replacing the public and private sections of LSLs;
- citizens replacing the private sections of LSLs and activities related to measures taken to make it mandatory for citizens to replace the private sections of their LSLs.

Both of the observed indicators provide little detailed information on progress toward achieving the target. As an example, we obtained a document showing the progress of the screening in 2019 based on indicators. The indicators used are worded as follows: *[TRANSLATION]* "monthly target" and "number of screenings." The indicators measure only the number of screenings achieved per month. They do not refer to the total number of buildings to be tested. Consequently, from this

document, we are not able to determine the progress of the screening activity with respect to the total number of buildings to be tested.

It is essential that more and better indicators be developed to measure the results and progress of all AP activities.¹³ The absence of specific indicators does not allow the performance of the activities carried out and of the AP as a whole to be monitored or evaluated. As a result, decision-makers do not have access to quality information on the degree of progress – in connection with the evaluation of the performance of the actions that are implemented – to be able to make informed decisions.

Performance Assessment of the Implementation of Action Plan Activities

We traced documents that reported an evaluation of certain activities regarding the implementation of the revised AP, including:

- the progress of LSL screening activities for the year 2019;
- the monitoring of the distribution of water jugs under the *Programme des personnes à faible revenu* for the period from January to May 2020;
- the response time to emails in the lead file for the period from October 2019 to May 2020.

A review of these documents, however, shows that the performance assessments are only for the year 2019 and part of 2020. With respect to assessing the progress of the screening, the document does not present any assessment in terms of the total number of tests completed and to be completed. It is therefore not possible to know the progress achieved with respect to screening since the beginning in terms of the total number of buildings to be tested. We did not locate any other performance assessment documents related to screening activities.

Although LSLR is one of the most important activities of the AP, we were unable to track any performance assessment for this activity or for the implementation of the AP in its entirety. The absence of a performance assessment of the AP makes it impossible to determine whether the measures put forward for each activity are effective or to clearly identify problems in order to make the required corrections to help the implementation of the AP move forward. There is a risk that the AP will not progress and be achieved as planned.

3.2.2.A. Recommendation

We recommend that the Service de l'eau revise the target in relation to the established screening timetable to reflect the new number of buildings to be tested, the goal being to ensure that the screening of lead service lines is completed as soon as possible to provide a complete picture of the lead service lines that will need to be replaced.

¹³ Since the end of the period covered by our audit, i.e., since February 2020, the Service de l'eau has reportedly begun to develop new indicators to monitor progress in implementing the Action Plan. These indicators were only used starting in August 2020 for the July 2020 balance sheet.

3.2.2.B. Recommendation

We recommend that the Service de l'eau include timetables, targets and indicators for all of the activities in the Action Plan to replace the lead service lines, the goal being to allow for follow-up, measure the results obtained, assess the progress of the Action Plan and make any necessary adjustments.

3.2.2.C. Recommendation

We recommend that the Service de l'eau adopt a documented mechanism and periodically assess the performance of the implementation of all of the activities in the Action Plan to replace lead service lines, the goal being to identify problems and make any necessary adjustments.

3.3. Monitoring the Implementation of the Action Plan

3.3.1. Monitoring the Action Plan

Our audit revealed that employees from different sections and divisions within the SE are assigned to monitor the implementation of the various AP activities. In the boroughs also, employees are involved in monitoring LSLR activities mainly.

While various documents are used for monitoring purposes, for example, an Excel file used to track the number of LSLs replaced per borough and a document used to track the replacement reports filed for 2019, we observed that certain aspects of the monitoring work lacked rigour. Indeed, before 2019, these reports were requested from the people in charge of carrying out work on the City's territory only at the end of the year, i.e., once the work had been completed. There was therefore a risk that the SE would not receive all of the reports and, as a result, would not be able to update the situation, particularly on the interactive map intended to inform citizens, and that it would not be able to report on the progress made in implementing the AP.

Thus, the situation in relation to the SE's knowledge of LSLR work was as follows:

- For the year 2020¹⁴: data are not yet available;
- For the year 2019: replacement reports are still missing (almost 4%);
- For the year 2018: although the reports may have been recovered, they have not yet been accounted for and the missing data in these replacement reports has not yet been assessed. Such an exercise would provide a picture of the number and type of missing or erroneous information in order to improve the monitoring when the people in charge of carrying out the work enter the information in the replacement reports;
- For the years 2007 to 2017: the proportion of missing reports is not known, as the SE had not counted the LSLR reports obtained during this period.

¹⁴ The scope of our work in 2020 covers the months of January and February only. LSLR work is not carried out during this winter period. It is therefore expected that data would not yet be available.

Regarding the replacement of water fountain LSLs, although the SE had conducted tests during the summer 2019 period, no follow-up had been carried out by the SE or the boroughs during the period covered by our audit.

In addition to the difficulty that the SE has in obtaining LSLR reports, there might also be issues related to the coordination of LSLR work in certain contract categories, human resource requirements in the boroughs for screening and the involvement of more boroughs in LSLR work. However, we did not track any specific documented follow-up on such issues that are nevertheless related to activities required to implement the AP. Monitoring the AP cannot be reduced to technical aspects alone. Implementing the AP activities involves a certain level of complexity and several stakeholders. Not taking these issues into consideration in a follow-up does not foster effective implementation of the AP.

3.3.1.A. Recommendation

We recommend that the Service de l'eau monitor lead service line replacement activities, including the review of lead service line replacement reports, to address specific issues and situations that may have an impact on the implementation of the Action Plan.

3.3.2. Data Collection, Compilation and Validation

The Collection and Compilation Process

Screening is the activity that consists of testing drinking water for each selected building to determine whether or not lead is present according to the current standard or guidelines. Once the analysis has been performed using the prescribed equipment, the results obtained must be recorded in a file kept for this purpose. It is on the basis of this data that it is possible to assess the progress made in implementing the AP, to make the necessary decisions regarding the follow-up on its implementation and to ensure appropriate accountability.

With the exception of training documents for screening trainees and screening protocols, we could not locate any policy or guidance regarding the collection and compilation of screening results. The staff of the SE with whom we met told us that technological tools and a new computerized application were used to improve the collection and compilation of screening results.¹⁵

The staff we met in the CDN-NDG borough said that, in general, data regarding screening activities carried out in the borough is sent to the SE. However, we were told that the borough did not always provide all of the data related to the screening activities that it had carried out. We believe it is important that all screening data be collected and compiled seeing as the lack of such data has an impact on the means of communication intended for citizens, particularly the interactive map.

¹⁵ The new application, in use primarily since 2020, is still in development.

We conducted tests on the screening data in relation to the data collection and compilation processes. LSLR reports from the two audited boroughs for the year 2019 were used to select the samples in order to compare the data from the SE's screening files with the interactive map data. We sampled 15% of the addresses included in these reports for each borough. It is important to note that LSLR reports provide the actual condition of the service line at the time the work is carried out, i.e., whether the service line is made of lead, while the screening confirms the presence of an LSL without the replacement work having been carried out. For the combined data from both boroughs, the tests show that 27% of the data presents different problems in the collection and compilation processes. In the course of these tests, we noted that there is a risk of confusion for citizens due to the information disclosed on the interactive map for the following reasons:

- In 9% of cases, when the Excel file of the screening data indicates no analysis, i.e., no screening, the replacement report and the interactive map indicate the presence of an LSL;
- In 5% of cases, when the Excel file of the screening data indicates no analysis, the interactive map indicates that there is no LSL, whereas in the field, the replacement report indicates the presence of an LSL;
- In 3% of cases, when the Excel file of the screening data does not include information, the replacement report indicates the presence of lead and the interactive map indicates the possible presence of lead;
- The remaining 10% of cases are individual cases where the information provided in the three locations is inconsistent and sometimes contradictory. For example, the Excel file of screening data indicates the absence of an analysis, the replacement report indicates the presence of an LSL and the interactive map indicates the absence of an LSL.

LSLR activities also generate data, as they involve work done to replace the LSL with a new line made of an approved material. However, this data is not added to the interactive map, making it currently impossible for a citizen to know whether the City has actually replaced the LSL at a given address.

As with the screening data, we looked for the existence of a framework used to collect and compile the data resulting from LSLR work. We tracked a guideline produced in March 2017 and revised in December 2017 which includes provisions for the collection and compilation of data regarding LSLR work. It had been sent to the stakeholders involved in the LSLR, asking them to collect and compile data in a specific database. However, this database ceased to be used in 2019 and was permanently closed in January 2020. For the period of our audit, this guideline was still in force. It had not been modified to explain the new procedure for collecting and compiling information.¹⁶

¹⁶ A new guideline was produced in July 2020 by the Service de l'eau. It includes a new approach to data collection and compilation.

In April 2019, a memorandum was sent to the stakeholders involved in LSLR work in order to standardize the use of LSLR reports. However, as described above, our audit revealed problems with the follow-up in terms of retrieving LSLR reports.

With respect to LSLR work carried out by citizens themselves, we did not find any procedure used to collect and compile data related to such work. Also, we were unable to trace any data logs of private sections of LSLs replaced by citizens. We obtained screening reports from the CDN-NDG and MHM boroughs indicating that citizens at certain addresses had themselves had their part of the LSL replaced. These reports also indicate that several private sections of LSLs had been replaced. However, the SE still does not keep a register of data on the private sections of LSLs. As a result, it is not possible to obtain the complete list of the data regarding the replacement of private sections of LSLs.

The lack of a specific framework for collecting and compiling data on all AP activities poses a risk to the accuracy and completeness of the data, as data reports are missing even after several years. Furthermore, there is no mechanism to provide the assurance that all reports and data have been retrieved. This has a significant impact because it is currently not possible to insert all the LSLR data into the interactive map created to inform citizens and therefore enable them to make informed decisions. Nor is it possible for the people in charge of the work to have access to all the data to more easily plan the work.

Although activities have been carried out to improve the data collection and compilation process, additional efforts will be required to ensure that all of the required data is collected and compiled and that this process is documented.

The Validation Process

With respect to screening activities, we did not find evidence of a documented data validation exercise or of documents confirming the reliability of the data. For example, there is no record of how the 2007 data on buildings that may have an LSL had been extracted. After the adoption of the revised AP in 2019, the SE re-examined the real estate assessment roll using criteria such as “[TRANSLATION] built before 1970” and “[TRANSLATION] 8 dwellings and less” while taking care to exclude large buildings such as shopping centres and warehouses. This exercise results in approximately 40,000 new buildings to be tested for the possible presence of an LSL. Despite the experience of not having documented the methodology in 2007, the methodology for 2019 was not documented either. The absence of such documentation does not allow employees who must subsequently act in this matter to fully understand what has been done, especially since the replacement of LSLs is governed by a timetable that now extends from 2007 to 2030.

With respect to LSLR work, the SE staff members we met with said that they had conducted a verification exercise on the 2018 data. For the years 2007 to 2017 and 2019, a verification exercise of the replacement data is reported to be currently under way. However, we found no evidence that this entire verification process was documented, including for the year 2018 for which the SE staff we met with confirmed that all replacement reports had been obtained. Also, we could not locate any document to support the reliability of the LSLR data. In the audited boroughs,

although there is reportedly a process for validating data on LSLR work, no evidence of the process or its implementation could be provided to us.

We found that one member of the SE's staff developed a checklist for validating LSLR data reports. However, the SE staff told us that the validation process performed is limited to the Excel files received. The staff does not field check to determine whether the person in charge of carrying out the work or the site supervisor has collected, compiled and validated the data.

Our audit allowed us to observe that several employees of the City, the boroughs and the construction site supervision firms are involved in the processes of collecting, compiling and validating LSLR data. In such a context, the absence of a mechanism to oversee the validation process means that data may be missing and that the reliability of existing data cannot be confirmed. Since this data is used to plan replacement work, is and will be communicated to citizens to enable them to make decisions concerning them and is used for accountability purposes, the City must ensure its completeness and accuracy.

3.3.2.A. Recommendation

We recommend that the Service de l'eau establish a mechanism to oversee the processes for collecting, compiling and validating data related to the screening and replacement of lead service lines and document the application of these processes to demonstrate the thoroughness of the approach used, to provide assurance of the completeness and reliability of the data and to demonstrate this assurance as required.

3.3.3. Monitoring Regulations and Guidelines

In order to speed up LSLR work in particular, CC adopted two by-laws and the SE issued guidelines and memorandums over the years

As a result of *By-law O2-002*,¹⁷ when a borough contracts for the complete reconstruction of pavement infrastructure as part of a local PRR, it will be required to replace the LSLs, if applicable. A review must therefore be conducted on a contract-by-contract basis to determine whether the conditions for the application of the by-law are met and whether the by-law therefore applies.

¹⁷ *Règlement intérieur de la Ville sur la délégation de pouvoirs du conseil de la Ville aux conseils d'arrondissement*, city council of the Ville de Montréal, *By-law O2-002* adopted December 18, 2001, section 1, paragraph 4.1. Amendments to the By-law on July 4, 2013, September 23, 2013, August 21, 2017, and June 15, 2020, regarding LSLs.

Under *By-law 17-078*,¹⁸ the City may perform LSLR work on private property when specific conditions are met. However, this by-law only applies in cases where a building's wall is located within a distance of 1.5 m of the public sidewalk. Upon completion of a roadwork or LSLR contract, a review should be conducted to determine whether the by-law applies to the private sections of LSLs in order to replace them, if necessary. The replacement of the private section of the LSL is at the owner's expense.

Application of *By-law 02-002*

In the case of the two audited boroughs, contracts were carried out under the local PRR. However, these documents do not specifically refer to *By-law 02-002* or to a review of contracts to determine whether or not the conditions for the application of the by-law are met with respect to the replacement of LSLs.

The CDN-NDG borough only started carrying out LSLR work in 2018, while the by-law was adopted in 2013, and, for the years 2013 to 2017, the borough carried out several local PRRs. For 2018, the borough has included LSLRs in two local PRRs. However, it is not clear from the documents reviewed whether all of these local PRRs, for the year 2018, have been reviewed to determine whether the by-law applies. Consequently, even for the year 2018, there is no evidence that shows that the by-law was perfectly applied. For 2019, the borough replaced LSLs primarily in another form of project and not through local PRRs specifically. As a result, two contracts were awarded that were solely for replacing LSLs. For these contracts, we have no evidence that they were reviewed to determine whether the by-law applies.

Documents obtained from the MHM borough show that it carried out LSLRs under local PRRs between 2014 and 2019. However, for 2017 and 2018, the nature of the information contained in these documents does not support the conclusion that the local PRRs included the LSLRs. For 2017, a decision-making record awarding a contract under the local PRR for the reconstruction of the pavement and sidewalks on six local streets does not include a review of *By-law 02-002* in connection with the LSLR. For 2019, the borough included LSLRs in local PRRs as well as pursuant to contracts.

Based on these findings, the City does not have the assurance that all local PRRs were completed in accordance with the by-law.

¹⁸ *Règlement relatif au remplacement par la Ville de la section privée des entrées de service d'eau en plomb*, city council of the Ville de Montréal, *By-law 17-078*, adopted on August 21, 2017. The by-law took effect in January 2018. Amendment to the *By-law* on June 18, 2018. *By-law 17-078* was repealed by *By-law 20-030* in June 2020, which incorporated the provisions of *By-law 17-078*. *By-law 20-030* was in turn amended in December 2020 and the replacement of the private section is no longer limited to LSLs located within 1.5 m. Work on the replacement of the private sections of LSLs (full program) has not yet begun.

Application of *By-law 17-078* (replaced by *By-law 20-030* in June 2020)

We were unable to locate any document indicating that the CDN-NDG borough reviewed *By-law 17-078* in 2018 in connection with contracts or work to replace the public sections of LSLs to determine whether there are any private sections of LSLs that need to be replaced. The borough states that it did not replace private sections of LSLs. For 2019, there are replacement reports for buildings that confirm that the public sections of LSLs were replaced and that the distance of the LSL from the private section was assessed to determine whether it was within 1.5 m of the public sidewalk. However, we found no evidence that all contracts or work done in 2019 were subject to such reviews regarding the application of *By-law 17-078*. Based on our review of the decision summaries for contracts awarded for work including LSLRs for the years 2018 and 2019, we noted that these contracts have not taken into consideration the *By-law 17-078* and the LSLR of the private section.

For the MHM borough, there exists a summary table of LSLR work for the years 2014 to 2019 which refers to this by-law. Reports also exist for 2019 indicating that the private sections of LSLs were replaced as part of local PRR work. However, since there were several question marks entered in the 2018 summary table regarding the application of the by-law, we do not have evidence that the regulation was applied for all contracts and work carried out in 2018.

The by-law provides that the cost of replacing the private section of an LSL and connecting it to the water system is charged to the owner. The SE is responsible for compiling the LSLs that are replaced on private property and sending this data to the City's Service des finances (SF) in order to bill the citizens concerned. Yet the 2018 data file, i.e., the first year after the by-law took effect, was sent to the SF in February 2020. It was therefore more than a year after the LSLRs before the City was able to bill the owners for the work completed pursuant to this by-law.

Guidelines and Memorandums of the Service de l'eau

With respect to the guidelines and memorandums produced by the SE, we did not find evidence of documented follow-up by the SE. This does not provide the assurance that the guidelines and memorandums were applied by all of the stakeholders. In the absence of documented follow-up, it is more difficult to accurately assess problems with the implementation or application of these guidelines and memorandums. Nor have we traced any evidence that a person has been officially appointed in this regard.

It is important that mechanisms be developed to provide the assurance that guidelines and memorandums are followed up and documented. This would make it possible to better identify implementation or application problems and make the necessary corrections to achieve the objectives of the AP with respect to replacing LSLs.

3.3.3.A. Recommendation

We recommend that the boroughs of Côte-des-Neiges–Notre-Dame-de-Grâce and Mercier–Hochelaga–Maisonneuve set up documented follow-up mechanisms to ensure that all by-laws concerning the replacement of lead service lines, whether they are under the direct jurisdiction of the borough through a delegation of powers or otherwise, have been applied and to help identify problems related to the application of these by-laws to allow for the necessary corrections to be made.

3.3.3.B. Recommendation

We recommend that the Service de l'eau implement mechanisms to ensure data is processed for the purpose of billing the replacement of the private sections of lead service lines so as to enable the Ville de Montréal to recover the costs it incurred as quickly as possible.

3.3.3.C. Recommendation

We recommend that the Service de l'eau document the implementation of the guidelines and memorandums related to the replacement of lead service lines by the stakeholders in order to facilitate the identification of implementation problems and to make the necessary corrections as soon as possible.

3.4. Means Used to Communicate with Citizens

The issue of LSLs is a public health concern for which the City is not solely responsible. Since service lines are composed of both a public section and a private section, citizens are also responsible. It is therefore important to provide these citizens with information to enable them to make informed decisions, especially when it comes to LSLR.

In order to inform citizens about LSLs and the health risks they pose, the City has set up various means of communication, particularly the interactive map and the City's website.

The Interactive Map

The interactive map available on the City's website is intended to inform citizens whether or not there is an LSL at a given address. The occupant affected by the presence of an LSL can therefore purchase a water jug (e.g., a lead filtration system) until the replacement work is carried out on the public section and the building owner has the private section of the LSL replaced.

As of February 19, 2020, we noted that¹⁹:

- The City is making an online map available on which it is possible to consult the results of the LSL screenings carried out on its territory;
- These results are based on all testing conducted between 2007 and 2019 as well as on assumptions used by the City (e.g., year of construction and number of units) for buildings that were not tested;
- Data on the replacement of the public sections of LSLs was not available for consultation;
- The most recent update to the interactive map was made on November 21, 2019.

For a given address, four different messages can be displayed when the interactive map is consulted:

- *It is possible that there is at least one lead service line on the lot at this address;*
- *Tests conducted by the City confirm the presence of at least one lead service line at this address;*
- *The building located at this address was built after 1970 and/or consists of more than 8 units. The presence of an LSL is therefore unlikely;*
- *There is no LSL located at this address.*

This map gives citizens access to only partial information as it is not populated with data on LSLRs. If citizens cannot know whether or not the LSL at a given address has been replaced, they are unable to make informed decisions regarding their health or that of the building's occupants and the work to be done, if required. Furthermore, the message on the website leading to access to the map, which says that "[TRANSLATION] ...data regarding the replacement of the public sections of LSLs will be integrated at a later date", does not allow citizens to fully understand the importance of this data for the decision-making process that may affect them. Citizens are not necessarily specialists in this field, but they should nevertheless be able to understand and easily assess the consequences of the absence of LSLR data. LSLR work has been carried out since 2007 and, although the data exists, citizens do not have access to it. The map therefore does not reflect the actual situation. Additional information is necessary to help citizens understand the issues surrounding the absence of data.

Between the months of June and August 2019, the SE conducted 333 tests to detect the presence of lead in the City's water fountains in parks. However, although the last update of the map was after this period (November 21, 2019), the data does not appear on the interactive map. According to the SE, data regarding water fountain

¹⁹ An update to the interactive map was made on December 8, 2020. Results of screening conducted during the year 2020 were inserted in the map. Information regarding LSLRs is not yet available on the map. Information about water fountain screening is not yet available on the map.

screening is not yet included in the interactive map or any other similar map. Although this information concerns City property, citizens drink water from the fountains in the City's parks. They are therefore affected by the test results.

As previously mentioned, we assessed the concordance between the data provided in the LSLR reports obtained from the two boroughs, the data found in the SE's screening Excel files and the information provided on the interactive map. In the case of 25% of the addresses sampled from the replacement reports, the information on the interactive map does not match the information provided in the other documents. In most cases, the LSLR report indicates the presence of lead whereas the interactive map indicates the absence of lead or the possibility of lead. Based on the information made available by the City through this map, there is a risk that citizens will make erroneous decisions regarding the replacement of their LSL or their drinking water consumption – with consequent impacts on their health.

The Website

The City's website at the time of our work on February 17 and 19, 2020, had a tab entitled "*Problématique du plomb*" [TRANSLATION] "*Problem of lead*" and various subsections including one on "*Plan d'action remplacement*" [TRANSLATION] "*Replacement Action Plan*" outlining the 2019 AP and the six actions implemented by that plan and "*Avez-vous une entrée de service en plomb?*" [TRANSLATION] "*Do you have a lead service line?*" describing various precautionary measures to be taken before consuming water if lead is present. However, this tab of the City's website did not present any information regarding the LSLs connected to the water fountains in the City's parks and buildings.

As a result of our audit, the City's website has been modified to include information regarding the LSLs connected to the water fountains in the City's parks and buildings. However, not all water fountains have yet been tested or had their LSLs replaced. It is therefore important that the website be updated to provide periodic information on the progress of these activities.

In addition, the website provided more limited information regarding the status of all aspects of the LSL replacement AP. This goes against the recommendation of the DRSP which asked the City in October 2019:

[TRANSLATION] "*...to act transparently by informing the public of the presence of LSLs on its territory and the progress of its intervention plan.*"

As a result of our audit, new information has also been added regarding the progress of AP activities, including mitigation measures and the replacement of private sections of LSLs by the City. However, these activities have not yet been completed. The website will therefore need to be updated in order to present information on a regular basis on the progress and implementation of all of the activities provided for in the AP.

The City's website is a means of communication that provides the public with quick and easy access to information on LSLs at any time. Although efforts have been made to provide citizens with a certain amount of information about lead on the City's website, this remains a public health issue. The public has a right to know about the progress of the AP measures as it is affected, in particular by the replacement of LSLs and the implementation of mitigation measures. It is important that the website provide more complete information on the lead issue and on the progress made with respect to the implementation of the LSLR AP.

3.4.A. Recommendation

We recommend that the Service de l'eau ensure that the interactive map is updated with data on the replacement of lead service lines and the screening of water fountains on a regular basis, and that the information leading to access to the interactive map regarding the absence of replacement data be more explicit so that members of the public can make informed decisions to eliminate or reduce the risk to their health.

3.4.B. Recommendation

We recommend that the Service de l'eau ensure that the website is regularly updated with information on the progress of water fountain lead service line screening and replacement as well as with information on the progress made with respect to all aspects of the lead service line replacement Action Plan.

3.5. Accountability

Our audit allowed us to observe that there is no formal and periodic reporting to CC, the executive committee or the borough councils for the two boroughs aimed at informing them of the degree of progress made with respect to all of the activities provided for in the LSLR AP. Also, there is no periodic and formal reporting to the Direction générale of the City. The City does, however, report to the MELCC on the number of LSLs it replaces.

Nevertheless, there is information on LSLRs provided in the budget documents for the City as a whole and those more specific to the boroughs. These documents are available to elected officials, managers and even the general public since they can be found on the City's and boroughs' websites. However, this information is very sketchy and, for example, refers only to the total number of LSLRs for a single year and the total budget allocated for the replacement of LSLs.

In 2013 and 2014, during its review of the *By-law C-1.1 "Règlement sur la canalisation de l'eau potable, des eaux usées et des eaux pluviales"*, the Commission expanded its mandate to include the LSL issue. The SE reported on the LSL issue to the Commission during its work. The Commission's report, filed in 2014, included recommendations regarding, among other things, the progress made with respect to the AP approved in 2007 and to which the City's executive committee provided written responses to the Commission. We did not find any accountability

in subsequent years produced by the SE to formally inform the decision-making bodies of the progress made with respect to all aspects of the LSL replacement AP.

One consequence of the lack of formal and regular reporting to decision-making bodies is that decision-makers do not have access to all of the information they need to make informed decisions regarding the replacement of LSLs.

With regard to reporting on the progress of LSLRs within the SE and the two audited boroughs, managers are informed during informal meetings. Documents are sent and made available to managers regarding LSLRs. Managers are also informed of the replacement of LSLs through decision summaries that they are required to approve. However, in the absence of specific and detailed indicators regarding the implementation of the AP, managers do not have the benefit of detailed and complete reporting on all AP activities. This situation is not conducive to informed decision-making.

3.5.A. Recommendation

We recommend that the Service de l'eau, Côte-des-Neiges-Notre-Dame-de-Grâce and Mercier-Hochelaga-Maisonneuve boroughs to regularly and formally report on the progress made in carrying out the activities of the lead service line replacement Action Plan to promote informed decision-making by policy makers, elected municipal officials, project managers and the public.

4. Conclusion

The lead service line replacement (LSLR) Action Plan (AP) approved by the Québec government in 2007 aims to eliminate the source of lead contamination in drinking water, as lead poses a risk to human health, even at low doses. Lead service lines (LSLs) have been identified as the main source of lead in water on the Montréal territory. These LSLs are part of the water mains that supply drinking water to citizens. In 2019, Health Canada amended its recommended concentration standard, making it even more restrictive. This led the Québec government to react and ask the Ville de Montréal (the City) to develop a revised AP that takes this new, more restrictive standard into consideration. In its revised AP, the City pushed back the timetable for the replacement of all LSLs from 2026 to 2030.

Since 2007, actions have been taken to reduce the public's exposure to lead in drinking water through LSLs, including by:

- screening 39,000 buildings to determine the presence or absence of lead (as of January 24, 2020);
- replacing approximately 21,000 LSLs on the City's territory (as of December 31, 2019);
- making an interactive map available to the public indicating whether or not lead is present in buildings.

We note that the information available on how the replacement of LSLs is managed does not provide an overall picture of the situation to help make informed decisions and to properly inform the public.

We conclude that the replacement of LSLs has not progressed as planned in both the initial (2007) and revised (2009) APs. Given the lack of formal mechanisms and more complete documentation, we conclude that the City does not have the assurance that the municipal by-laws and administrative guidelines regarding the replacement of LSLs have been implemented. Despite the efforts made over these many years, the City will need to review the management practices in place with respect to the AP and multiply its efforts to replace all LSLs on the Montréal territory. To that end, we have made the following recommendations to the City:

- Better define the roles and responsibilities of the various stakeholders involved in lead service line screening and replacement activities and ensure that they are communicated and enforced;
- Revise the LSL replacement AP to ensure that it is updated to include all sectors of activity and new data, the goal being to eliminate all LSLs and to control any risk to the public from lead in drinking water;
- Revise the strategy regarding the replacement of private sections of LSLs to ensure that it includes all aspects so that the most appropriate solutions can be developed;
- Include timetables, targets and indicators for the AP activities to measure results and periodically assess the progress of the implementation of all AP activities so that any necessary adjustments can be made;

- Provide guidance on the data collection, compilation and validation processes related to the screening and replacement of LSLs to ensure the completeness and reliability of the data used to monitor the implementation of the AP;
- Develop documented tracking mechanisms for the by-laws and guidelines to provide the assurance that they are followed;
- Improve the means of communication to inform citizens about the LSLR work and the progress made with respect to all AP activities, in particular the interactive map and the website;
- Improve accountability in order to provide decision-making bodies with a more complete and comprehensive picture of the progress made with respect to all AP activities and thus enable them to make better decisions.

Although the issue of LSLs was raised with the City in 2007 with the first AP and represents a public health concern, eliminating all LSLs from the Montréal territory remains a major challenge for the City, with close to 140,000 buildings still to be screened for LSLs, approximately 48,000 LSLs to be replaced and approximately 21,000 private sections of service lines to be analyzed following the replacement of their public sections by the City

5. Appendices

5.1. Objective and Evaluation Criteria

Objective

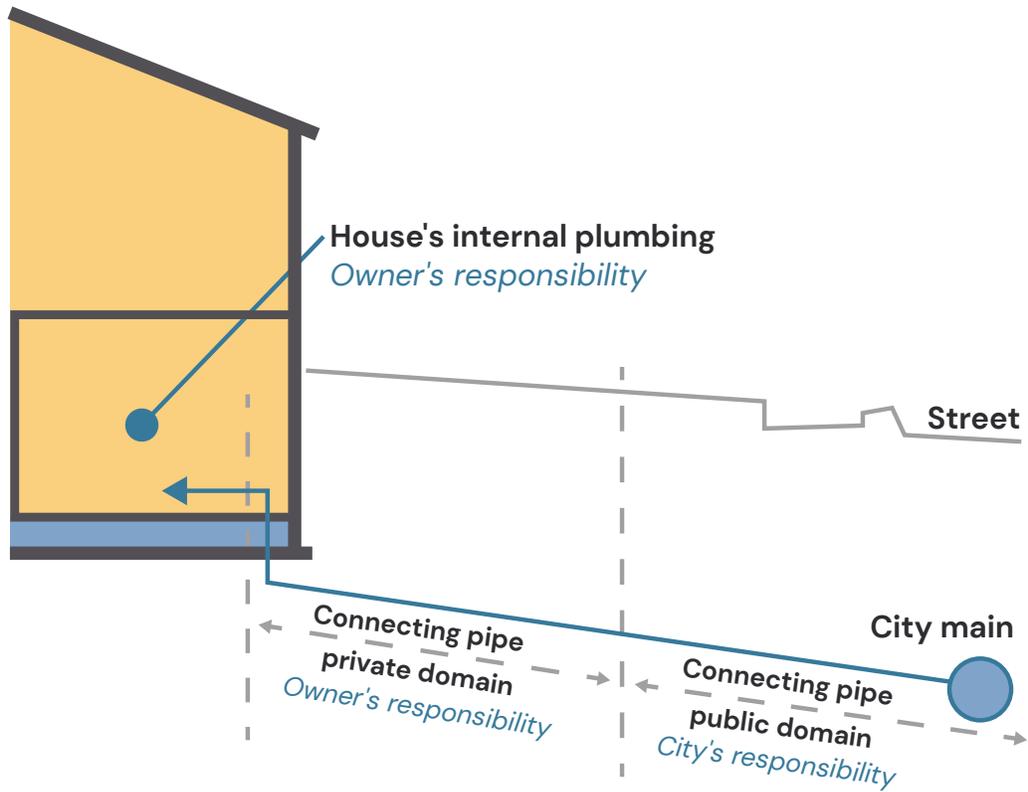
To ensure that the implementation of lead service line replacements is progressing in accordance with the 2007 Action Plan that was revised in 2019 and that the municipal by-laws regarding replacement work are being enforced as intended.

Evaluation Criteria

- The roles and responsibilities of the stakeholders involved are clearly defined, well communicated and properly applied.
- The Action Plan for the replacement of lead service lines is being implemented as planned, includes specific timetables and is supported by a reliably kept inventory.
- The *Règlement relatif au remplacement par la Ville de la section privée des entrées de service d'eau en plomb (By-law 17-078)* is correctly applied and the Ville de Montréal collects the amounts owed to it by the owners concerned.
- The boroughs replace service lines as part of their local *Programme de réfection routière*, as provided for in the *Règlement intérieur de la Ville sur la délégation de pouvoirs du conseil de la Ville aux conseils d'arrondissement (By-law 02-002)*.
- Effective and up-to-date communications are in place to inform citizens of the status of service line replacements and the risks to which they are exposed.
- Regular monitoring and reporting mechanisms are in place to report on progress and to inform decision-makers.

5.2. Illustration of a Service Line (Public and Private Sections)

Connecting the House to the Water System



Source: Ville de Montréal, Service de l'eau, website (section on lead and drinking water – 2020–2030 Action Plan)