



LEAD IN DRINKING WATER

INTRODUCTION

On 7 February 2017, the House of Commons adopted a motion asking the Standing Committee on Transport, Infrastructure and Communities (hereinafter “the Committee”) to undertake a study on the presence of lead in Canadian tap water. The Committee devoted five meetings to the [study](#), heard from nineteen witnesses and received two written briefs.

ENVIRONMENTAL LEAD EXPOSURE

Lead was once commonly found in many industrial and consumer products including paint, tin cans, lead crystal glassware, gasoline and, of course, lead piping. However, as scientific understanding of lead toxicity has improved, the federal government has taken steps to reduce Canadians’ exposure to lead: for example, the 1990 [Gasoline Regulations](#) resulted in the elimination of leaded gasoline while the [Food and Drugs Act](#) has ensured that the lead content in food and food packaging materials, such as tin cans, is controlled. Nevertheless, while the [National Plumbing Code](#) has restricted the use of lead in pipes since 1975 (and in solder since 1986) lead in drinking water remains a persistent problem.

Although no comprehensive national inventory of lead piping exists, witnesses [told](#) the Committee that it would not be unreasonable to assume that around 500,000 Canadian homes still have lead service lines. In addition, lead is known to enter the water supply through lead solder in plumbing, lead in brass fittings (e.g., faucets) and lead liners in water fountains. While some municipalities have taken steps to replace lead service pipes, Mr. Bruce Lamphear (Simon Fraser University) [explained](#) that water pipes and water fountains remain “an important source” of lead for many Canadians, especially those in smaller and First Nations communities.

A PUBLIC HEALTH CONCERN

Witnesses unanimously considered lead in drinking water to be a public health issue, and several provided compelling testimony as to the many and diverse effects of lead exposure on human health. Mr. Lamphear [noted](#) that there is no safe level of lead in children’s blood and explained its adverse effects as follows:

At high levels of exposure, we found that lead damages the prefrontal cortex. It elevates the risk that children will develop anti-social behaviours like delinquency and even



criminal behaviours. We also found that children who were exposed to high levels of lead were at increased risk for developing other types of behavioural problems like ADHD.

While children are considered to be most at risk from the effects of lead exceedances, Mr. Lanphear explained that lead is also an established risk factor for hypertension, chronic kidney disease and essential tremors (a nerve disorder characterized by uncontrollable shaking or tremors) in adults. Moreover, Mr. Marc Edwards (Virginia Polytechnic Institute and State University) informed the Committee that links have now been established between aging pipe infrastructure and the growth of “opportunistic premise plumbing pathogens,” such as *Legionella* bacteria.

In light of these concerns, witnesses favoured removing lead service lines from Canadian communities.

BARRIERS TO REMOVING LEAD SERVICE LINES

Although municipalities and expert witnesses expressed support for lead line replacement, they informed the Committee that certain barriers currently undermine efforts to address the problem.

Jurisdictional Complexities

While the federal government has certain responsibilities relating to health and infrastructure, the management of drinking water treatment and distribution falls within provincial jurisdiction and is most often managed by a municipal water authority in urban areas (Government of Canada, *Water governance and legislation: shared responsibility*). Furthermore, as several witnesses noted, water utilities are typically responsible only for the pipes that run from the water main to the property line, while homeowners are responsible for the remaining part of the service line.

Shared jurisdiction and shared ownership raise questions as to authority to act and liability for costs. For example, officials from the Office of Infrastructure of Canada explained that, while their department has several funding streams through which projects for water and waste-water public infrastructure can receive support, it is not mandated to fund projects relating to pipes on private property.

That said, several witnesses stressed the importance of ensuring that both the privately-owned and municipally-owned sections of a lead pipe are replaced. Witnesses, including Ms. Bernadette Conant (Canadian Water Network) and Mr. Graham Gagnon (Dalhousie University), told the Committee that replacing only the municipally-owned section of the pipe can aggravate the problem of lead exceedances, at least in the short term. This can

be explained by several factors, among them the release of particles and debris that is triggered when the formerly continuous pipe is cut to allow the municipal section to be replaced.

In view of these concerns, witnesses unanimously [agreed](#) that cooperation between all levels of government, and between government and homeowners, is essential.

Insufficient Data

The Committee heard that there is no comprehensive inventory of lead service lines in Canada. Witnesses identified a number of factors that contribute to this dearth of data: for example, Mr. Gagnon and Ms. Michèle Grenier (Ontario Water Works Association) [explained](#) that some records from early last century have been lost, while other more recent records are incomplete.

That said, Mr. Carl Yates (Halifax Water) [noted](#) that both the American Water Works Association and Halifax Water have identified inventory as a key issue that should be addressed. In a similar vein, Mr. Alain Desruisseaux (Office of Infrastructure of Canada) [recognised](#) that more needs to be done in terms of collecting asset management data on all categories of assets, including water.

Sampling Standards

As Mr. Greg Carreau (Department of Health) [explained](#), Health Canada works closely with the provinces and territories to develop guidelines for Canadian drinking water quality. In January 2011, the Federal–Provincial-Territorial Committee on Drinking Water published a [Public Consultation Document](#) proposing to reduce the maximum allowable concentration (MAC) of lead in drinking water from 10 to 5 µg/L (micrograms per litre).

Throughout the course of the hearings, witnesses, including Ms. Michèle Prévost (École Polytechnique de Montréal), [expressed](#) support for Health Canada’s proposed revised standard. However some witnesses, including the Canadian Waste and Wastewater Association [explained](#) that many utilities would be unable to adapt immediately to the new standard and consequently risked being deemed non-compliant by provincial regulators. Accordingly, Mr. Stephen Craik (EPCOR Utilities Inc.) [proposed](#) that any new guidelines should include an adjustment period for utilities.

Witnesses, including Mr. Craik, also [pointed out](#) that the outcomes of any lead monitoring program depend on “how samples are collected and tested, how many are collected, and when and where they are collected.” Mr. Craik therefore stressed the



importance of clarifying sampling protocols and monitoring program requirements in Health Canada's new guideline.

Cost

Witnesses unanimously agreed that cost is a significant barrier to lead pipe replacement. While acknowledging that costs vary according to the local context of each replacement, the Federation of Canadian Municipalities [informed](#) the Committee that it typically costs \$5,000 to replace the private portion of a lead service line and \$10,000 to replace the public portion (the higher costs for the public portion relate to matters such as street restoration and traffic control). However, witnesses including Ms. Grenier [explained](#) that economies of scale can be realized if homeowners replace their portion of the lead service line at the same time as the municipality is replacing its portion.

Several municipalities, including Halifax and Welland, have already taken active steps to encourage homeowners to take advantage of these economies of scale. For example, Halifax [offers](#) to pay 25% of the cost of replacing the private portion of a lead service line and pre-clears certain contractors for recommendation to homeowners. Similarly, the City of Welland has [introduced](#) a homeowner assistance program that provides homeowners with up to \$1,500 towards lead service line replacement through a joint program with the Niagara Region.

In spite of these efforts, Mr. Iannello (City of Welland) [told](#) the Committee that only 10% of the privately owned portions of known lead service lines in Welland have been replaced.

Over and above cost barriers, Mr. Craik [pointed](#) out that many lead service lines are attached to rental properties where residents have very little control over pipe replacement.

Public Education and Awareness Raising

A number of witnesses also identified a lack of public awareness as a barrier to lead pipe replacement. Mr. Craik [told](#) the Committee that many property owners are surprised to learn that they own a portion of lead piping, and are generally reluctant to spend money to replace it. Ms. Grenier [noted](#) that some homeowners, particularly "more mature customers," are resistant to changing their lead pipes as they feel they are no longer at risk from the effects of lead exceedances.

Some witnesses were also concerned about the lack of awareness among water utilities. Mr. Yates informed the Committee that he believes lead in drinking water to be a more serious issue “than many utilities in Canada and their provincial regulators understand.”

Beyond traditional public education measures, several witnesses recommended engaging with provincial real estate associations to make information on lead piping available to potential home buyers at the time a house sale is being concluded.

CORROSION CONTROL

As Mr. Gagnon explained, corrosion control is a process whereby water utilities can chemically alter their water to minimize lead release. Although full lead service line replacement removes the largest source of lead, witnesses informed the Committee that corrosion control is still necessary to mitigate the risk from other sources, such as solder and brass. Indeed, Mr. Craik told the Committee that EPCOR’s random sampling program has shown that lead levels can sometimes exceed the guideline concentrations even in homes where there is no lead service line.

OBSERVATIONS AND RECOMMENDATIONS

The Committee recognises that drinking water distribution is an area of provincial responsibility. That said, in light of both the public health risks posed by lead in drinking water and the federal government’s responsibilities in relation to infrastructure, the Committee makes the following observations and recommendations.

Observations

(i) Homeowner Assistance

The Committee observes that many witnesses highlighted the importance of assisting homeowners with the cost of lead pipe replacement. It notes that several municipalities have grant and loan programs that help make such replacements more affordable. The Committee observes the benefits of these arrangements and encourages municipalities to further explore existing options and other innovative measures.

(ii) Public Education and Awareness

The Committee observes that many Canadians remain unaware of both the existence of lead service lines in their communities and the full extent of the health problems associated with lead exceedances. The Committee encourages municipalities to continue



exploring means of raising awareness, educating communities, and facilitating disclosure of the presence of lead piping.

Recommendations

The Committee recommends that the federal government work with the provinces, territories, municipalities and other stakeholders to address the public health problem of lead in drinking water and to accelerate the replacement of lead service lines. Priority measures should include:

- **Working with the Office of Infrastructure Canada and other partners to identify potential sources of funding for provinces and municipalities to address their specific corrosion control and lead piping replacement challenges.**
- **Working with First Nations communities to address their specific corrosion control and lead piping replacement challenges.**
- **Working with the provinces, territories and municipalities to harmonize the implementation of Health Canada's lead guidelines and testing protocols across Canada.**

REQUEST FOR GOVERNMENT RESPONSE

Pursuant to Standing Order 109, the Committee requests that the government table a comprehensive response to this Report.

A copy of the relevant *Minutes of Proceedings* ([Meetings Nos. 48, 63, 83, 85 and 86](#)) is tabled.

Respectfully submitted,

Hon. Judy A. Sgro, PC, MP
Chair

