

## REPORT TO REGIONAL WATER SUPPLY COMMISSION MEETING OF WEDNESDAY, SEPTEMBER 18, 2019

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**SUBJECT**     **Guidelines for Canadian Drinking Water Quality – Recent Change in Lead Guideline and Capital Regional District Actions**

### **ISSUE**

Health Canada recently changed the maximum acceptable concentration for lead in drinking water measured at the tap. This report outlines the implications of the change and the ongoing and upcoming work to address this issue.

### **BACKGROUND**

In March 2019, Health Canada published revised guidelines for lead in drinking water, decreasing the maximum allowable concentration (MAC) of lead in drinking water from 10 µg/L to 5 µg/L. While 5 µg/L represents the maximum concentration at the consumer's tap, Health Canada recommends that lead concentrations should be as low as reasonably possible. The guideline is designed to protect pregnant women, infants and children, as they are the most vulnerable to the potentially harmful effects resulting from ingesting lead. The BC Ministry of Health also issued guidelines on evaluating and mitigating lead in drinking water in April 2019. Currently, consumers' tap sampling is not a requirement of the operating permit for the Capital Regional District (CRD) Regional Water Supply System, or the municipal and CRD distribution system operating permits issued by Island Health and guided by the requirements of the *BC Drinking Water Protection Act*. To achieve the new MAC 'at the tap' will require a combined effort from government, health authorities, water suppliers and distributors, as well as individual property owners, as water suppliers do not have direct control over water once it leaves the supply and distribution systems.

The drinking water in Greater Victoria can be generally characterized as a low to moderate risk for corrosivity, with a current mean pH of 7.6 and mean alkalinity (pH buffering capacity) of 16.5 mg/L for the water in the supply system. The water chemistry in Greater Victoria is very similar to other large west coast water systems (e.g., Metro Vancouver, Seattle, Tacoma or Portland). Lead does not naturally occur in the Greater Victoria source water. However, lead can leach out of pipes and fixtures into the water. The extent of leaching depends on the type and age of plumbing materials used, the corrosiveness of the water, and the length of time that the water is stagnant in the plumbing.

Lead-containing pipe materials were not commonly used in the supply system in this region. The potential lead sources would be individual water infrastructure components in the municipal distribution systems or brass (containing varying lead content) plumbing fixtures and lead-containing solder (used until 1986) inside buildings. Recent changes to the National Plumbing Code require that plumbing fixtures contain lower lead content; however, until 2012, fixtures sold in Canada could legally contain 8% lead, which is enough to cause an exceedance of the MAC on stagnant water samples<sup>1</sup>. The lead content requirement is now a maximum of 0.25% lead as a weighted average with respect to the wetted surface.

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<sup>1</sup> Government of British Columbia, H. P. (2019, April). *How Drinking Water is Protected in BC - Province of British Columbia*. Retrieved from <https://www2.gov.bc.ca/gov/>: [https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/how-drinking-water-is-protected-in-bc/guideline\\_on\\_reducing\\_exposure\\_to\\_lead\\_through\\_drinking\\_water\\_april\\_26\\_2019.pdf](https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/how-drinking-water-is-protected-in-bc/guideline_on_reducing_exposure_to_lead_through_drinking_water_april_26_2019.pdf)  
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## **Regional Water Supply Commission – September 18, 2019**

### **Canadian Drinking Water Quality – Recent Change in Lead Guideline and CRD Actions 2**

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The CRD has, and continues to, investigate this issue, due to the potential health risks, high public awareness and concerns from other jurisdictions.

In addition to water quality monitoring required under the *BC Drinking Water Protection Act and Regulation* and the CRD's Water System Operating Permit, the CRD regularly collects samples and tests parameters relevant for assessing metal leaching risks in the Regional Water Supply System and the municipal distribution systems. Critical parameters such as pH, alkalinity, hardness, conductivity and others, are monitored across the region monthly and even weekly in some cases. In five strategic locations where the Regional Water Supply System transitions to a municipal distribution system, a full suite of metal tests are analyzed every second month to monitor metal concentrations entering the municipal systems. This provides staff and the stakeholders with a good general understanding of the water properties affecting metal corrosion and metal leaching in the drinking water and it ensures that sudden changes in water chemistry that could lead to an increased risk are detected in a timely fashion. As reported in the Greater Victoria Drinking Water Quality 2018 Annual Report, in all of the samples, the lead concentrations were below the new MAC.

In 2007 and 2008, the CRD conducted a study in 152 random residential homes of differing age across the region and tested lead concentrations at the kitchen taps, following sampling protocols as per US EPA standards, and which are consistent with Health Canada and BC Ministry of Health guidelines. Less than 5% of the samples (4.6%) exceeded the Action Limit (15 parts per billion, or ug/L), which puts Greater Victoria drinking water into a “not excessively corrosive for lead” category under Health Canada guidelines. In 2012, the CRD began planning to upgrade its primary disinfection facility, the Japan Gulch Disinfection Facility, which included a switch from chlorine and ammonia gas injection to liquid sodium hypochlorite and ammonia injection. This project, fully commissioned by May 2019, not only improved the disinfection process, but also had the positive effect, as anticipated, of increasing the mean pH from 7.1 to 7.6, along with a slight increase in alkalinity. This increase in pH and alkalinity further reduces the corrosiveness of the water in the system and, therefore, reduces the lead leaching potential in building plumbing.

In 2018, the CRD conducted a lead investigation in the Juan de Fuca (JdF) Distribution System to identify any potential lead sources within the distribution infrastructure. More than 50 initial lead samples were collected and analyzed and several follow-up samples were collected in a number of areas to identify potential lead sources. One pump station in Sooke, found to generate elevated lead levels, was successfully mitigated by changing the pump operation cycles. Other minor, localized lead sources were found at fire hydrants, where water can be stagnant for long periods, drawing lead from the internal brass hydrant components. No lead sources problematic for public health were detected.

In 2018, the CRD planned a comprehensive “Greater Victoria pH & Corrosion Study – Phase 1”, encompassing the Regional Water Supply, the Saanich Peninsula Water System and the Juan de Fuca (serving the Westshore municipalities), District of Saanich, City of Victoria and District of Oak Bay distribution systems. This project began in August 2019 following the completion of the new disinfection upgrades, in order to account for the anticipated change in pH and alkalinity. This project is now underway and, with the assistance of consulting firm Kerr Wood Leidal, the CRD will assess in detail the corrosiveness of the water in all parts of the systems to identify areas with higher corrosion potential. The study will include factors such as a corrosiveness index, as

well as the age of buildings, with the assumption that older homes have a higher likelihood of lead-containing plumbing fixtures. Preliminary sampling and corrosivity results will be available by the end of Q4 2019, with further sampling and analysis scheduled for Q1 2020. The final results, expected in Q2 2020, will provide important information on where to focus future monitoring efforts for lead compliance.

Based on the Phase 1 study results the CRD, with the other stakeholders, will consider undertaking sampling at consumers' taps (Phase 2 of the pH and Corrosion Study) in areas highlighted as having a higher risk of elevated lead concentrations. This will also inform the CRD and participating municipalities where to focus resources on removing potential lead sources within the municipal infrastructure and whether centralized pH and/or alkalinity adjustment on the supply system should be considered (Phase 3 of the pH and Corrosion Study). Island Health supports this approach to understanding and reducing the potential exposure to lead from the tap water. Since a reduction of lead at the tap will be difficult to achieve through centralized mitigation alone, all parties will share in the responsibilities and actions through a multi-barrier approach informed by the work initiated by the CRD.

The Health Canada information included in the attachment, *Drinking Water: what about lead?*, provides an overview of the risk and health effects, and information regarding sources of lead in drinking water and simple actions to reduce exposure to lead from drinking water (Appendix A). The attachment is available through the CRD website. The CRD Water Quality Division and Island Health are also available to respond to any questions or concerns regarding lead in drinking water.

## **CONCLUSION**

In March 2019, Health Canada published revised guidelines for lead in drinking water, decreasing the maximum allowable concentration (MAC) of lead in drinking water from 10 µg/L to 5 µg/L based on a sample of water taken at the tap and using the appropriate protocol for the type of building being sampled. The CRD regularly tests for lead concentrations in five strategic locations where the Regional Water Supply System transitions to a municipal distribution system. As reported in the Greater Victoria Drinking Water Quality 2018 Annual Report, in all of the samples, the lead concentrations were below the new MAC. However, the CRD has undertaken a multi-phase, systematic approach to further study and analyze the potential exposure to lead from drinking water in this region. This approach recognizes the urgency and importance for more data, while ensuring scientifically defensible results are used to inform decisions regarding the removal of potential lead sources within the distribution infrastructure and whether centralized pH and/or alkalinity adjustment on the supply system should be considered. The CRD continues to be diligent and proactive in ensuring that the best available science and knowledge is applied to protecting the public health.

**RECOMMENDATION**

That the Regional Water Supply Commission receive this report for information.

Submitted by:	Glenn Harris, Ph.D., R.P.Bio., Senior Manager, Environmental Protection
Submitted by:	Ted Robbins, B.Sc., C.Tech., General Manager, Integrated Water Services
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, M.C.I.P., R.P.P., Chief Administrative Officer

Attachments: Appendix A – Drinking Water: What About Lead?

CM/TR:ss/slw/dd

# DRINKING WATER: what about lead?

## Overview of risk and health effects

It is important to reduce exposure to lead as much as possible because health effects of lead may occur even at low concentrations.



### Who is most at risk from exposure to lead?

- Children, infants and foetuses are most at risk because of their developing brains
- Exposure to lead poses a risk to everyone's health

### What are the health effects of being exposed to lead?

- Effects on neurological development and behaviour in children, including reduction of intelligence quotient (IQ)
- Increased blood pressure or kidney problems in adults

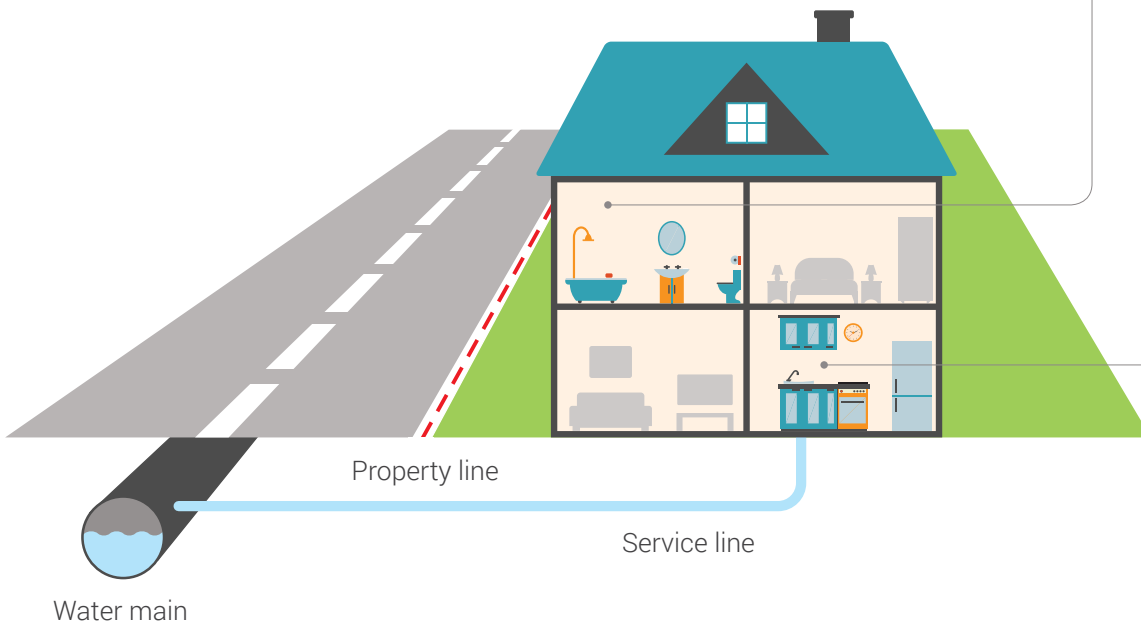


Any reduction of exposure **TO LEAD** decreases the risk of negative health effects.

# What are the sources of lead in drinking water?

## Some piping, plumbing materials or fittings may contain lead:

- Some homes may have a lead service line—the pipe connecting the house plumbing to the water main—the National Plumbing Code allowed lead as a material in pipes until 1975
- Brass faucets and fittings may contain lead
- Some plumbing may contain lead solder—the National Plumbing Code allowed lead in solder until 1986



Brass fittings



Lead solder



## How does lead get into drinking water?

- As water sits in pipes for several hours, lead can leach into the water
- Small particles containing lead can also break free and be carried to the tap

## How do I know if my home has a lead service line?

- Talk to your municipality or water utility—they probably know if your neighbourhood has lead service lines

You can also:

- Look for the pipe that brings water into your house from the water main—a lead service line would be a greyish-black, soft metal—easily dented or scraped with a knife.



# Simple actions to reduce exposure to lead from drinking water

## Flush out your pipes before consuming the water

- Has water been sitting in your pipes for several hours? Run the tap until it's cold (about one minute) before drinking or cooking with any of the water from that tap
- Only use cold tap water for drinking or cooking, since hot water increases the leaching of lead and other metals from your plumbing



## Clean your taps monthly

- Every month, inspect the aerators or screens at the tap
- If you find debris, clean it out—this will remove any particles that may contain lead, and inspect more frequently
- If you do not find debris, continue to inspect monthly



## Replace Brass fittings

- Brass faucets and valves can contain some lead—These can be replaced with fittings that are certified to the standard on low lead content



## A household water filter at the tap can effectively remove lead from your water

- Recommended as a temporary solution
- The filter must be installed and maintained properly or it could become ineffective
- Test your water for lead before installation and during use to confirm the filter is working



**Make sure that any device you purchase is certified to the NSF International standard for removal of lead.**



## How do I test my water

- Talk to your local health unit to find an accredited laboratory that can test your water





## If your home has a lead service line

- The best permanent solution is to have it replaced
- In most communities, the municipality is only responsible for a portion of the service line, and you are responsible for the other portion
- Ask your municipality or water utility about any programs or incentives for replacing lead service lines

## What action has the Government of Canada taken on lead?

### Federal regulations and guidelines have helped to reduce or eliminate:

- Emissions of lead into the air, water or soil from industry
- The use of lead in fuels, paints and coatings, consumer products and toys
- Lead in foods, beverages and agriculture

The Guidelines for Canadian Drinking Water Quality ([www.canada.ca/en/health-canada/services/environmental-workplace-health/water-quality/drinking-water/canadian-drinking-water-guidelines.html](http://www.canada.ca/en/health-canada/services/environmental-workplace-health/water-quality/drinking-water/canadian-drinking-water-guidelines.html)) provide technical guidance to help municipalities and utilities minimize the occurrence of lead in drinking water.



For more information on reducing your exposure to lead from drinking water, please visit: [www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/water-talk-minimizing-exposure-lead-drinking-water-distribution-systems.html](http://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/water-talk-minimizing-exposure-lead-drinking-water-distribution-systems.html) or contact us as at: [hc.water-eau.sc@canada.ca](mailto:hc.water-eau.sc@canada.ca)

