

Lead Sampling in Drinking Water at Schools and Child Care Centres and in Municipal Drinking Water Systems

To: Chair and Members of the Board of Health

Meeting Date: February 5, 2020

Report No. **BH.01.FEB0520.R02** Pages: 6

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Recommendations

It is recommended that the Board of Health:

1. Receive this report for information.

Key Points

- Regulation 170/03, under the *Safe Drinking Water Act (2002) (the "Act")*, requires municipalities to routinely test for lead levels in the drinking water system.
- Regulation 243/07, under the *Act*, requires all Ontario schools and licenced child care centres to sample standing water and flushed water for lead in plumbing.
- Regulation 169/03, under the *Act*, established 10 micrograms per litre as the drinking water standard for lead.
- There were no lead exceedances from any distribution samples, taken in 2019, from the 23 municipal drinking water systems in Wellington, Dufferin and Guelph.

- There were 1,728 samples of water taken, in 2019, from plumbing fixtures at schools and child care centres under Regulation 243/07. Of those samples, 50 exceeded the drinking water standard of 10 micrograms per litre and 5 of those were from a flushed sample.
- Corrective action was taken for each exceedance.

Discussion

Background

The Ministry of Environment, Conservation and Parks (MECP) enforces Regulations made under the *Act* including: Ontario Regulation 170/03 - respecting Large Municipal Residential Systems; and Regulation 243/07 - respecting schools and child care centres.^{1,2} Under Regulation 170/03, municipal distribution systems are required to test for lead every 3 years, though some municipalities have exemptions. An example of such an exemption is the City of Guelph where the City's Lead Reduction Plan was developed and includes sampling of residential plumbing. Under Regulation 243/07, all schools and licensed child care centres are required to test all fixtures where water is accessible to students/clients.

In Ontario, the *Act*, Regulation 169/03, established 10 micrograms per litre as the drinking water standard for lead.³

Overview

There are 23 Large Municipal Residential Drinking Water Systems in Wellington, Dufferin and Guelph. In total, there were 136 samples of municipal drinking water tested for lead levels in 2019. None of the 136 samples exceeded the maximum acceptable concentration for lead of 10 micrograms per litre. The relatively small number of samples reflects the 3-year sampling frequency. There is one municipal drinking water system (Hillsburgh) that requires quarterly sampling, each year, based on relatively higher concentrations of naturally occurring lead in their source water. It should be noted that all samples from the Hillsburgh distribution system are included in the 136 results, noted above, and are below 10 micrograms per litre.

The MECP also enforces regulation 243/07, under the *Act*, which requires all Ontario schools and licensed child care centres (as defined in the Child Care and Early Years Act, 2014) to regularly test water for lead in standing and flushed water samples. The MECP oversees the regulatory requirements for sampling and testing as well as the flushing requirements of plumbing systems within these facilities.

New enhanced MECP sampling requirements for schools and child care centres were put in place in 2017 requiring these facilities to sample all drinking water fixtures and any fixture that is used to prepare food or drink within 3-5 years. Previously, these facilities were only required to test one tap per year. Any result above the Provincial drinking water standard of 10 micrograms per litre of lead in drinking water must be reported to both, the local Public Health unit and to the MECP. Wellington-Dufferin-Guelph Public Health (WDGPH) staff, from the Health Protection Division, assess the information provided to ensure these facilities are taking appropriate corrective actions to minimize exposures which could include the following:

- Resampling (required for every exceedance);
- Immediately render fixture inoperable/inaccessible (required for flushed sample exceedances);
- Increasing flushing frequency;
- Replacing fixtures and plumbing components;
- Installation of NSF approved filters designed to remove lead; and
- Permanently rendering the fixture unusable.

These enhanced sampling requirements have resulted in more lead exceedances throughout Ontario, including: Wellington, Dufferin and Guelph. In 2019, there were 1,728 samples of drinking water taken from fixtures at these facilities. Of the 1,728 samples taken, 50 exceeded the standard of 10 micrograms per litre and 5 of those 50 sample results were taken from a “flushed” water, the other 45 were from “standing” water samples. The facilities with the adverse samples took corrective action to either decrease the level of lead or make the water inaccessible.

Health Effects

Lead is a naturally occurring material found in such things as air, soil, food, water and some consumer/industrial products.⁴ Lead is a neurotoxin. Children absorb a greater percentage of lead from the gastrointestinal tract than do adults and neurotoxicity is more prominent in children than adults because of their incomplete blood-brain barrier.⁵ Neurotoxicity manifestations may include low intelligence quotient (IQ), hearing loss, hyperactivity and developmental delays. In adults, lead exposure is associated with increased blood pressure, altered kidney functioning, increased cardiovascular risk, adverse cognitive outcomes and malignancy.⁵⁻⁷

Overall, lead exposure has decreased in the last 30 years due to more stringent regulatory requirements for lead in drinking water, plumbing supplies, consumer products, food containers, toys, paints and gasoline.^{6,8}

In general, drinking water is a minor contributor to overall lead exposure and does not constitute immediate concerns or risks. As described above, the *Act* established 10 micrograms per litre as the drinking water standard for lead.³ This standard is set to protect the entire population including those most at risk (children under 6 years of age). The standard is a threshold for further investigation and action to reduce exposure.

Conclusion

All municipally supplied drinking water in Wellington, Dufferin and Guelph is below the acceptable limit of 10 micrograms per litre for lead. Schools and child care centres are tested frequently and exceedances are uncommon. There is a prescribed response to any lead exceedances and the MECP and WDGPH ensure corrective action is taken.

Ontario Public Health Standard

One of the goals of the Safe Water Program is to prevent or reduce the burden of water-borne illnesses related to drinking water. This Report provides information related to compliance with the Safe Water Program requirements of the Ontario Public Health Standards and provides information that supports ongoing education for Board of Health members to remain informed of relevant trends and emerging public health issues.⁹

WDGPH Strategic Direction(s)

- ☒ **Health Equity:** We will provide programs and services that integrate health equity principles to reduce or eliminate health differences between population groups.
- ☒ **Organizational Capacity:** We will improve our capacity to effectively deliver public health programs and services.
- ☒ **Service Centred Approach:** We are committed to providing excellent service to anyone interacting with WDG Public Health.
- ☒ **Building Healthy Communities:** We will work with communities to support the health and well-being of everyone.

Health Equity

Children are particularly vulnerable to the health impacts of environmental lead, including exposure to lead in drinking water. Older housing and poverty are associated with children's blood lead levels.¹⁰ Older homes that have not replaced their plumbing, often found in poorer neighborhoods, may be a source of lead exposure for children. In Ontario, the *Act* established 10 micrograms per litre as the drinking water standard for lead.³ This standard is set to protect the entire population, including those most at risk (children under 6 years of age). To further protect children, Regulation 243/07 requires all schools and licensed child care centres test all accessible water fixtures.

References

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Appendices

None.