

**REPORT TO REGIONAL WATER SUPPLY COMMISSION
MEETING OF WEDNESDAY, JUNE 16, 2021**

SUBJECT Regional pH & Corrosion Study Update

ISSUE SUMMARY

To provide an update on the Regional pH & Corrosion Study, including preliminary results from the residential tap sampling program that was included in the ongoing Greater Victoria pH & Corrosion Study.

BACKGROUND

In response to new drinking water guidelines issued by the BC Ministry of Health in April 2019, the Capital Regional District (CRD) added a residential tap sampling program to the scope of the Greater Victoria pH & Corrosion Study. The participating municipalities of Saanich, Victoria/Esquimalt and Oak Bay agreed to proportionally cost-share this added scope in order to include their municipal water systems into this program.

In early 2020, the consultant leading the study designed the tap sampling program based on information gathered in the study areas on building age, known history of lead service lines or previous lead results, and water corrosivity indices developed in earlier parts of the study. During the first iteration, approximately 200 houses were identified in the study areas of Saanich, Oak Bay, Victoria/Esquimalt and the Westshore municipalities (including Sooke), based on these criteria. The onset of the program was delayed by COVID 19 protocols until October 2020. Because the participation rate was lower than desired, an additional 100 houses were selected in a second iteration in early 2021. Due to COVID 19 protocols, the communication with residents was limited to a letter drop. The start of the tap sampling program was further delayed by the temporary decommissioning of the new hypochlorite disinfection equipment at the Goldstream Water Treatment Plant in 2020 and into early 2021. The temporary switch to the gas chlorination system to complete deficiency work altered the water chemistry sufficiently to have a potential effect on metal leaching test results. It was important to continue the study under consistent water chemistry conditions to yield scientifically defensible results and reflect future water quality conditions.

In April 2021, the tap sampling program proceeded with 124 houses whose owners volunteered to participate with sampling their kitchen taps. By April 16, 2021, samples from 104 houses across the identified study areas were received at the commercial laboratory for analysis. The samples consisted of three 1-litre bottles collected in accordance with the lead sampling protocols in the BC Ministry of Health and Health Canada guidelines (Appendix A).

The first 1 litre sample was taken from the kitchen tap after a minimum of 6h complete water stagnation in the residential plumbing system (First Draw sample). This would have been typically very early morning before any resident uses any water fixtures or taps. Results of the First Draw samples are measured against the Canadian Drinking Water Guidelines Action Limit of 15 µg/L to determine whether water chemistry conditions are corrosive and centralized corrosion control treatment is warranted. The critical statistical measure for this determination is the 90 percentile (P90: the lead concentration that the highest 10% results exceed) of all First Draw samples. The second and third 1 litre samples were taken from the same kitchen tap after five minutes of running the tap and subsequent 30 minutes of stagnation (30MS). These samples represent a typical tap use pattern and signify typical lead and copper concentrations that a resident would consume

when using this tap. Results of these 30MS samples were compared to the Health Canada maximum acceptable concentration (MAC) of 5 µg/L for lead and 2,000 µg/L for copper.

In May 2021, CRD staff received the laboratory results and immediately performed a preliminary analysis of the data to inform the participating residents in a timely manner, as well as municipalities and Island Health. Residents were provided with an explanation of the results and, in case of any exceedances, provided with educational material to help them identify potential lead sources and show them how to protect themselves from high lead concentrations until any lead sources are eliminated.

A more comprehensive evaluation and assessment of the tap sampling results will be included in the final report of the overall Greater Victoria pH & Corrosion Study, which is expected to be completed in late Q2 2021.

Tap Sampling Results

Of the 104 houses that submitted samples across the study areas, only one house registered an exceedance of the First Draw sample Action Limit. The same house also had an exceedance of the MAC in the 30MS samples. This is a clear indication of a lead source in this particular residential plumbing system.

No further exceedances of the Action Limit or the MAC were recorded for any other property. The 90 percentile of the First Draw samples was 0.00187 mg/L, well below the Action Limit. Three houses registered an elevated lead concentration between 0.005 and 0.006 mg/L, which is below the Action Limit but does indicate a minor lead source near the sampling tap. Mitigation could be as simple as replacing the kitchen faucet with a new, lead-free fixture.

Only the one aforementioned exceedance of the MAC in the 30MS samples was recorded in all samples. This represents an exceedance percentage of 0.95%. The total average of all 30MS samples was 0.00047 mg/L and, therefore, well below the MAC. These results do not indicate a community health concern associated with consumption of tap water in Greater Victoria.

For each participating jurisdiction, the lead and copper results are summarized in Tables 1 and 2.

Table 1: 2021 Tap Sampling Program Lead Results

Study Areas	P90 of 1st Draw Samples [µg/L]	Action Limit for P90 [µg/L]	% of Exceedance of Action Limit in 1st Draw Samples	Average of all 30MS Samples	MAC for 30MS [µg/L]	% of Exceedance of MAC in 30MS Samples
CRD-Westshore	1.20	15	0%	0.35	5	0%
Victoria/Esquimalt	2.38	15	0%	0.52	5	0%
Oak Bay	1.24	15	0%	0.35	5	0%
Saanich	2.58	15	3.70%	0.59	5	3.70%
CRD-Sooke	1.55	15	0%	0.30	5	0%
Overall Results	1.87	15	0.95%	0.47	5	0.95%

Table 2: 2021 Tap Sampling Program Copper Results

Study Areas	P90 of 1st Draw Samples [µg/L]	Action Limit for P90 [µg/L]	Average of all 1st Draw Samples	% of Exceedance of Action Limit in 1st Draw Samples	Average of all 30MS Samples	MAC for 30MS [µg/L]	% of Exceedance of MAC in 30MS Samples
CRD-Westshore	294.77	1300	134.66	0%	71.42	2000	0%
Victoria/Esquimalt	207.00	1300	126.68	0%	55.24	2000	0%
Oak Bay	306.60	1300	144.69	0%	65.11	2000	0%
Saanich	294.40	1300	163.34	0%	51.91	2000	0%
CRD-Sooke	262.90	1300	138.93	0%	59.67	2000	0%
Overall Results	295.3	1300	141.41	0%	59.01	2000	0%

Next Steps

The final report of the Greater Victoria pH & Corrosion Study will provide recommendations for the CRD and Island Health to consider. CRD staff have discussed preliminary results with Island Health. There was consensus that due to the relatively small sample size and recognition that not all areas of the region were fully covered, the CRD will conduct a supplementary tap sampling program toward the end of 2021. Water suppliers (i.e., CRD, municipalities) will follow up this study with future tap sampling within their own jurisdiction in consultation with Island Health. The CRD will ensure the work is done in a coordinated and collaborative process, recognizing that each water supplier is responsible for identifying and removing potential lead service lines and/or communicating with affected customers on risks associated with lead concentrations in tap water. CRD staff will evaluate the regional findings with Island Health to inform a system-wide reevaluation of potential corrosion control treatment needs.

CONCLUSION

Staff expanded the scope of the ongoing Greater Victoria pH & Corrosion Study to include a tap sampling program in response to new lead monitoring requirements issued by the BC Ministry of Health in April of 2019. The preliminary results of the tap sampling conducted in April 2021, which targeted 104 homes for higher potential risk, indicate no community health concerns associated with lead or copper in homes served by the Greater Victoria Drinking Water System. The results indicate there is not a need for regional corrosion control treatment at this time. However, the CRD and the municipalities cannot conduct sampling in every home or business; therefore, property owners will need to be aware of potential risks associated with some private plumbing, pipes and fixtures. The CRD will continue to work with all water suppliers and Island Health to ensure safe, potable drinking water and promote outreach and education to all residents and business owners about any water quality risks.

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
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Ted Robbins, B.Sc., C.Tech., General Manager, Integrated Water Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

ATTACHMENT

Appendix A: Lead Sampling Procedure