VCH Licensed Child Care Facilities: Lead in Drinking Water Sampling Survey

April 2023

Vancouver CoastalHealth

Executive Summary

What We Did

In response to a decision made at the Public Health Executive Committee for British Columbia, Vancouver Coastal Health (VCH) commenced a survey to test for lead in the drinking water of licensed child care facilities. From February to April 2022, VCH Health Protection staff collected 1786 drinking water samples from 1476 child care facilities across VCH.

The intent of this survey was to confirm if lead levels in the drinking water of child care facilities remained below the maximum acceptable concentration for the day after being flushed at the start of the day. Using the Random Day Time sampling protocol, samples were collected from the kitchen fixtures used for consumption without pre-flushing or implementing an artificial stagnation period. Since 2012, VCH has required licensed child care facilities to run water fixtures used for consumption at the start of each operating day for five minutes or until the water runs cold.

What We Found

Laboratory results determined 22 (1.2%) of the drinking water samples had lead levels above Health Canada's current maximum acceptable concentration for lead of 5 micrograms per litre as established in the *Guidelines for Canadian Drinking Water Quality: Guideline Technical Document - Lead (March 2019).* These results were from 20 (1.4%) of the licensed child care facilities sampled. In 1159 (64%) of the samples, lead concentrations were below the detection limit of the laboratory analysis.

Our findings indicate that the requirement to flush drinking water fixtures at the start of each day has an effect in lowering lead levels below both the maximum acceptable concentration and laboratory detection limits in drinking water. VCH will continue to require child care facilities to flush drinking water fixtures, used for consumption at the start of each operating day, for a period of five minutes or until the water runs cold. Alternately, point of use lead reduction treatment units or bottled water could be used in place of flushing to cold.

Table of Contents

1 - Introduction

Vancouver Coastal Health (VCH) issues licenses to all child care facilities (CCFs) under the Child Care Licensing Regulation. Section 48(5) of the Child Care Licensing Regulation states:

> *A licensee must ensure that safe drinking water is available to children.*

In 2019, the Public Health Executive Committee for British Columbia directed B.C. Health Authorities to sample ALL licensed CCFs for the presence of lead in their drinking water. This report presents the testing protocol, testing results, follow-up measures when lead levels exceeded the maximum acceptable concentration (MAC), and recommendations for licensed facilities.

Previously, as part of our on-going monitoring of licensed CCFs, VCH conducted a survey in 2012 of drinking water lead levels in a select number of VCH facilities. Survey findings supported the practice of licensing officers (LOs) directing licensees of CCFs to flush their drinking water fixtures used for consumption for five minutes or until cold at the start of every day of operations.

2 - Background

2.1 Chronic Exposure to Lead

Lead can be harmful to human health, even in very small amounts. Impacts of lead exposure are increased for pregnant women and young children because infants and children absorb lead more easily than adults and are more susceptible to its harmful effects. The public's exposure to lead has decreased over the years as major sources of lead have been eliminated (e.g., from paint and gasoline). Remaining sources of lead may include drinking water, food, old paint, household dust, soil, jewelry, toys, herbal medicine, and cosmetics.

No cases of children being adversely affected by lead in drinking water have been reported in VCH. However, it is important to reduce lead exposure as much as possible. For example, small incremental increases in exposure could be problematic if children already have a significant body burden from other sources.

Health Canada's *Guidelines for Canadian Drinking Water Quality* (GCDWQ) establishes the Maximum Acceptable Concentration (MAC) for lead at 5 micrograms per litre (µg/L). Note: The MAC was reduced in 2019 from its previous level of 10 µg/L.

Health Canada also added this statement to the GCDWQ:

> *Every effort should be made to maintain lead levels in drinking water as low as reasonably achievable (ALARA).*

The ALARA statement recognizes that particularly for children, there is no safe level for lead. Therefore, even if lead levels are below the MAC, if there are reasonable methods of further lowering lead levels then those methods should be employed.

2.2 How Does Lead Get Into Drinking Water?

In general, B.C.'s drinking water supply systems have very low levels of lead. However, many water systems on the South Coast of B.C. have "soft" and slightly acidic (i.e., low in pH, hardness, and alkalinity) drinking water. This soft water interacts negatively with the lead-containing solder connections and brass fittings (e.g., taps, valves, and meters) in a building's plumbing. When soft water sits unused in piping, overnight or over weekends, lead could be released from the plumbing into the water.

The quantity of lead released into water from the plumbing depends on a combination of factors (Figure 1). Amendments in plumbing codes and practices over the years are reducing these risks.

EFFECT ON LEAD RELEASE	
LOW pH	↑
LOW ALKALINITY	↑
SOFT WATER	↑
CONTACT TIME	↑
CORROSION INHIBITORS	↓
COLD WATER	↓

Figure 1 — Factors Affecting Lead Release in Water

Lead in drinking water has long been a potential concern in older buildings:

1. In Canada prior to 1975, the water line serving a property and building was permitted to be made out of lead. Termed "Lead-Service-Line" (LSL), these lines could have a significant contribution to lead levels in drinking water. Fortunately, the use of LSL in the Metro Vancouver area and other regions of VCH was low and there is no known issue with LSL being present.
2. In buildings built before the 1989 revision of the B.C. Plumbing Code restricting the use of lead solder in potable water pipes.
3. In buildings built prior to 2012 when the Canadian standards for lead content in wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures lowered the requirement for "lead-free" components from 8% down to 0.25% lead as a weighted average.

Buildings constructed prior to or soon after these dates may have fixtures with higher lead content than the current acceptable level. This may result in higher lead levels from a building's water fixtures.

2.3 Minimizing Exposure to Lead in Drinking Water

The Canadian Center for Occupational Health & Safety's Hierarchy of Controls model (Figure 2) is a step-by-step approach to the reduction of hazards in a controlled setting or situation. This model has the most effective control measures at the top and least effective at the bottom. In many cases the successful control of a hazard involves a multi-barrier approach starting at the top and proceeding down as far as necessary. How this model may be adapted and applied to lead in drinking water is detailed below.

Figure 2 Hierarchy of Controls

ELIMINATION

The most effective way of reducing lead in drinking water, and the most challenging, as we all need access to safe water on a daily basis.
Example: If a fixture exceeds the MAC, others that do not may be used for water consumption.

SUBSTITUTION

Use a potable water source such as bottled water.
Substitute components to lower lead levels:

- Service lines
- Pipes with soldered joints
- Brass control valves
- Faulty mixing valves that leak internally and allow hot water to leach higher levels of lead into drinking water
- Fixtures used for consumption

ENGINEERING CONTROLS

Change the characteristics of the drinking water to reduce the uptake of lead from plumbing components. Increasing pH and alkalinity of the distributed water are the most common changes made. The source water cannot be changed, but water treatment units can be installed in the CCF (e.g., under-the-counter lead reduction filters, corrosion control system for the building). There are ongoing filter replacement and/or maintenance costs.

ADMINISTRATIVE CONTROLS

One simple control method which can been employed by anyone is to flush a water fixture until the water temperature turns cold prior to consuming. The cold water temperature is a reliable sign that the water from the fixture has not been sitting in the building's plumbing system for a period of time.
Note: Water temperature change can take longer in a large building. Also, someone must flush the lines to the level required at the start of each day or when water has been stagnant for an extended period of time.

PPE – PERSONAL PROTECTIVE EQUIPMENT

PPE does not apply in the traditional sense in this situation. Active carbon filters in water containers cannot reduce elevated lead levels in drinking water to below the MAC.

3 - Child Care Lead in Drinking Water Sampling Survey (2012)

In 2012, VCH undertook a sampling survey of licensed CCFs. Facilities with differing licence categories and building types in VCH were selected and tested for the presence of lead and copper in their drinking water. A brief description of the survey and results are presented below.

NOTE: at the time of this 2012 survey, the MAC for lead in drinking water as per the GCDWQ was 10 ppb and there was no official ALARA statement.

3.1 Methodology

A total of 64 facilities were selected to be tested by VCH Drinking Water Officers (DWOs) and Environmental Health Officers (EHOs) with the following geographical breakdown:

Coast Garibaldi	15	Richmond	12
North Shore	16	Vancouver	21

The sampling protocol was a First Draw (FD) followed by a second Fully Flushed (FF) sample taken after the water flowed until cold. VCH DWOs collected the water samples and documented the following information:

- Age of structure (or plumbing)
- Time of sampling
- Water use (estimated time and volume during the day) prior to collecting sample
- First Draw lead & copper levels
- Initial water temperature
- Time to flush to cold
- Flushed water temperature
- Fully Flushed lead & copper levels
- pH
- General comments

3.2 Results

The results of the 2012 survey found that 17% of the facilities' FD samples exceeded the MAC for lead in drinking water at the time (10 ppb). That number increases to 28% if the FD sample results are compared to the current MAC of 5 µg/L. No facilities exceeded the former MAC for their FF sample, however two facilities would have exceeded the current MAC.

The sampling results show that:

- Daily flushing of stagnant water in building plumbing is needed in VCH CCFs to keep the lead levels as low as possible in drinking water.
- Manual routine flushing, done properly, can ensure the lead levels are below the MAC in the drinking water guidelines.

3.3 Conclusions

After the 2012 survey, VCH Licensing Officers (LOs) required all CCF licensees to develop a plan to flush their drinking water plumbing. At the time it was reasoned that for facilities constructed after 1989, a baseline water quality test might be adequate to ensure lead concentrations were below guideline levels. Older facilities might require daily flushing of taps and fountains used for drinking water based on their survey results. VCH worked with all facilities to assure sampling and flushing procedures were managed in an appropriate and cost effective manner.

2012 survey outcomes:

- Flushing water fixtures prior to use, until water runs cold, can effectively lower lead levels in drinking water.
- All facilities were required to establish procedures to flush their drinking water fixtures at the start of each day.
- LOs began checking for compliance with these procedures during routine inspections.

4 – VCH Licensed Child Care Facilities: Lead in Drinking Water Sampling Survey (2022)

In 2019 the Public Health Executive Committee (PHEC) directed B.C. Regional Health Authorities (HAs) to sample CCFs for the presence of lead in their drinking water. PHEC allowed the design and implementation of the survey to be determined by each HA.

Changes have been made to lower lead levels for the population as a whole in the decade since VCH's previous sampling survey in CCFs.

- The MAC for lead in Health Canada's CGDWQ was reduced from 10 µg/L to 5 µg/L.
- An official As Low As Reasonably Achievable (ALARA) statement to the MAC was added.
- Lead content in plumbing components has been reduced.
- Metro Vancouver water system was improved.
    - Seymour-Capilano Filtration Plant was constructed and in operation.

    - pH in the distributed water was increased to the low 8s range.
    - The alkalinity and hardness levels were adjusted in the distributed water.
- A second chemically assisted (including pH adjustment) water filtration plant was added on the Sunshine Coast.
- Reliance on groundwater (typically with naturally higher pH and hardness) was increased in the Sea to Sky region.

The COVID-19 pandemic delayed this survey. The preliminary planning started the summer of 2021. Interior and Island Health had already started (and in Island Health's case completed) their sampling survey and graciously shared their resources to assist us with designing our sampling survey.

4.1 Sampling Protocol

For this 2022 survey, two documents were used to determine which sampling protocols would be the most appropriate:

- BC Ministry of Health, Health Protection Branch: *Guidelines on Evaluating and Mitigating Lead in Drinking Water Supplies, Schools, Daycares and Other Buildings*. April 2019.
- Health Canada: *Guidelines for Canadian Drinking Water Quality - Guideline Technical Document – Lead.* March 2019.

To choose a sampling protocol, VCH compared First Draw (FD) vs Random Daytime Sampling (RDT). Health Canada recommends RDT sampling for CCFs, and state that:

> *"In schools and daycares, it is recommended that total lead be monitored, at least once per year, at each of the drinking water fountains or cold water taps where water is used for drinking or food preparation...RDT sampling should be conducted by collecting a sample at drinking water fountains or at cold water taps where water is used for drinking or food preparation, without a stagnation period and without prior flushing. Two 125 mL samples should be collected, preferably in wide-mouth sample bottles, at a medium to high flow rate without removing the aerator…The sampling plan for schools and child care centres/facilities must consider that many occupants in these buildings are the most susceptible to the adverse health effects from lead exposure. Consequently, sampling plans for these facilities should prioritize every drinking water fountain and cold water outlet used for drinking or food preparation over infrequently used outlets."* (Health Canada, 2019)

FD sampling generally provides the worst case scenario for lead levels and tends to overestimate the actual daily dose exposure. VCH used this protocol in a select number of CCFs in 2012, and repeating it in all CCFs would provide limited new information, as VCH already requires every facility to flush their drinking water fixtures at the start of the day, and checks for compliance during routine inspections. For facilities with FD sampling levels exceeding the revised MAC for lead, those results would not change the current flushing directive.

Normally facilities with FD samples below the MAC for an element would not need to conduct a morning flush to cold. However, Health Canada's As Low As Reasonably Achievable (ALARA) statement implies that if flushing reduces lead levels even further below the MAC (as found in previous sampling in VCH), then it is to be employed at all facilities no matter the results of the FD sample.

For this reason, VCH used a Random Daytime (RDT) sampling protocol for the 2022 survey to determine if the current flushing directive is effective in reducing lead levels throughout the day in each facility or if additional measures need to be taken to mitigate the risks from elevated lead levels in drinking water.

Health Canada recommends taking two 125 mL RDT samples in immediate succession to assist with the determination of the source of the problem.

- Fixtures contributing to high lead levels would generally have elevated test results in the initial 125 mL sample, and a lower lead level in the second 125 mL sample.
- Alternately, if the second 125 mL sample had a higher concentration, the issue could be the building piping and valves.

However, the MAC is calculated as an average of the two samples. As a large number of facilities required testing in this survey, a single 250 mL RDT sample was determined to be a more efficient use of resources.

Finally, Health Canada recommends RDT sampling at all drinking water fixtures in the facility to get a good sense of exposure. For our survey, any fixture used for food preparation or drinking water was tested. The same protocol was used when a follow-up sample was required from facilities with lead levels exceeding the MAC – termed Stage 2 sampling.

VCH made the additional decision to limit the sample period to between either 0900-1100 hrs or 1400-1600 hrs while the facility was operational. These time periods were most likely to have occasional and sporadic water use, potentially representing the worst-case situation for an operating facility using a morning flush.

One of the concerns with morning flushing, and the basis of our survey, is that over the course of the day lead concentrations in the drinking water have the potential to rise whenever water remains in the building's distribution system as shown in Figure 3.

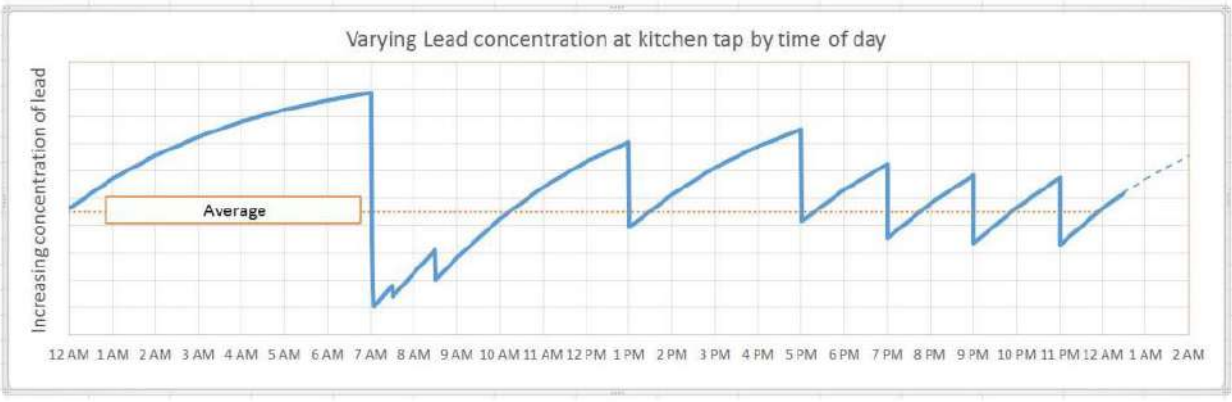

Figure 3 – Health Protection Branch's Guidelines on Evaluating & Mitigating Lead in Drinking Water Supplies, Schools, Daycares and Other Buildings

It would be expected that water sampled immediately after a high use event such as a morning flush or session of food preparation would have very low lead levels given the short period of time the water has had contact with the building's plumbing. Also, limiting the sampling to the two selected time periods better represented when the drinking water would probably have elevated lead levels. If a facility did not conduct a morning flush as directed, either samplers conducted a flush to cold then sampled 30 minutes later or they returned another day when a morning flush was performed. Licensing officers were to follow up with licensees who were not complying with the flushing requirement.

4.2 Methodology

Selection of Laboratory for Sample Analysis

A number of laboratories were available for sample analysis. We selected the laboratory based on the price per sample, documentation needs and their ability to provide us with the means to preserve samples at the time of collection. Preserving samples involves adding concentrated nitric acid to the water sample when the sample is collected. This acidification retains the metals in solution and removes the need to refrigerate the samples, and extends the period of time before the samples need to be analysed. This method was cost effective, allowed us to collect samples over a week, and courier them weekly to the lab.

Staff Resources

The water sampling team consisted of 19 Environmental Heath Officers, student EHOs, health science professionals, and retired Health Protection staff. In remote areas of VCH, DWOs collected the samples.

Breakdown of Areas

Senior Environmental Health Officers (SEHOs) in each HSDA were assigned to coordinate the daily sampling operation.

To facilitate sample collection, VCH was subdivided into its Health Service Delivery Areas (HSDAs):

- Central Coast
- North Shore
- Richmond
- Sea to Sky
- Sunshine Coast
- Vancouver

Data Management

CCF facility and contact data was extracted from our database and placed in a master spreadsheet. The data was sorted first by HSDA then by postal code. Using postal codes allowed us to manage the workload geographically, which was useful and efficient for sampling in dense urban areas. Each facility was assigned four unique sample codes which the samplers used to identify individual samples. The unique codes allowed us to merge the lab sample results with our master spreadsheet.

Field Sampling Data Sheet

A Field Sampling Data Sheet (FSDS) was created to collect information for data analysis (Appendix 1). Multiple sample sites in a CCF could be recorded on one form. For each CCF, the water samplers documented:

- Facility name and number
- Date and time of sampling
- Water source
- Presence of filters
- Age of building; plumbing changes
- Description of flushing procedures and confirmation flushing was completed on the sampling day
- Location of the fixture(s) sampled; approximate time of last use;
- Temperature of water
- Observations or notes
- A floor plan of the sampling locations if required

OH&S

The water samplers had to handle nitric acid when water sampling. We consulted with VCH Occupational Health & Safety and determined the following personal protective equipment (PPE) was required:

- Safety Data Sheet for HNO_3
- Gloves
- Protective eyewear
- Eyewash bottle

Sampling Instructions

An online training session was held for the water samplers via Zoom. They received a copy of the PowerPoint slide deck (Appendix 2) and a single page summary document to take on-site (Appendix 3). Both documents detailed the procedures involved with:

- Gathering the required supplies and equipment including PPE before leaving the office
- Physically collecting the water sample and fixing the sample with nitric acid at the facility
- Documenting information related to the specific sampling site
- Completing laboratory Chain of Custody (COC) forms and ensuring proper storage of samples after returning to office

Communications: Pre-Survey

Prior to the survey, each licensee received an emailed letter and frequently asked questions (FAQ) document (Appendix 4) informing them of the survey and that a VCH employee would visit their facility to:

- Collect a random drinking water sample from fixtures used for consumption, and
- Ask facility-related questions.

Communications: Post-Survey

For sample results ***below*** the MAC, licensees were:

- Emailed a letter (Appendix 5) to inform them the sample results were satisfactory
- Provided links to additional resources about lead and lead reduction
- Emailed a letter to send to the parents of children at the CCF (Appendix 6)

For sample results ***above*** the MAC, Licensees were:

- Immediately contacted by phone by the SEHO in their HSDA
- Emailed a letter (Appendix 7) to inform the licensee of the requirements to address the elevated lead levels detected in their drinking water.
- Emailed a letter to send to the parents of children at the CCF (Appendix 8)

Additional Control Measures & Follow-up

The direction given to CCF licensees was to stop using the water for drinking and/or food preparation from the fixtures with elevated lead levels. The licensee was then required to provide a remediation plan to address the elevated lead levels in their drinking water fixture(s). The remediation plans ranged from operational changes to changes to the plumbing fixtures.

Once the additional control measures were implemented, resampling of the fixture(s) was conducted. The same methodology was used for resampling. Samplers confirmed control measures were implemented, and clearly documented them on the sampling sheet.

4.3 Results

VCH collected 1786 Random Day Time (RDT) samples from 1476 facilities using the methodology previously described. A total of 22 (1.2%) of the samples from 20 (1.4%) facilities had lead levels exceeding the current MAC of 5 micrograms per litre (µg/L). The data is shown in Table 1.

Sample Code	Results µg/L (ppb)	Sample Code	Results µg/L (ppb)	Sample Code	Results µg/L (ppb)	Sample Code	Results µg/L (ppb)
SITE 01	5.53	SITE 07	5.59	SITE 13	7.50	SITE 18A	7.99
SITE 02	5.69	SITE 08	10.8	SITE 14	15.0	SITE 18C	36.2
SITE 03	5.51	SITE 09	10.9	SITE 15	8.20	SITE 19	37.7
SITE 04	6.12	SITE 10	7.71	SITE 16A	25.9	SITE 20	6.42
SITE 05	6.65	SITE 11	30.6	SITE 16B	96.1		
SITE 06	5.40	SITE 12	12.5	SITE 17	9.59		

Table 1 – Lead sample results

Significantly, 1159 (64%) of facilities had lead levels below the laboratory detectable limit (< 0.2 µg/L) for the test. This demonstrates an exceptionally high level of compliance with the MAC (98.8%) and that a majority of the facilities are operating in compliance with the ALARA statement of reducing lead to levels that cannot be detected by common laboratory methods.

The number of samples collected met the minimum data set for statistical analysis. However, the low number of facilities with exceedances means there is little value in conducting statistical analysis on the results.

4.4 Observations

Direct comparison between facilities which exceeded the MAC to compliant facilities is not relevant. Instead, data comparisons as a whole were reviewed to see if there were observable trends related to potential lead levels that may or may not have exceeded the MAC.

The previous 2012 survey on lead levels in drinking water in CCFs had a much higher percentage of facilities exceeding the MAC; however, the sampling protocol used in that survey was First Draw (FD) – which is known to be the worst-case scenario and expected to have a higher number of results exceeding the MAC. For this reason, even though the facilities themselves are directly related, the different sampling protocols used for the different sampling studies do not allow for direct comparison of the results between the two studies.

Analysis of Collected Data and Results

Information about the facility, its plumbing and facility's water usage the day of sampling was collected at the time of sampling and entered onto the FSDS. In many CCFs the staff did not have detailed knowledge of the building and/or plumbing to share with the samplers. The information that was provided was used with the results to see if there were correlations that contributed to elevated lead levels on a whole being higher with the presence of a particular feature or situation.

The following data comparisons were done using scatter point graphs with trend lines:

- Building age vs. lead concentration
- Fixture last use time vs. lead concentration
- Water temperature vs. lead concentration

No trends were noted in these comparisons.

Time of Sample

A simple comparison between the numbers of samples collected in the two sampling periods was done to determine if the breakdown of samples exceeding the MAC varied.

Samplers were directed to attempt to collect water samples between one of two designated sampling periods: 0900 – 1100 hours or 1400-1600 hours. However approximately 30% of the samples were collected between 1100-1400 hours.

The results in Table 2 show the likelihood of a sample exceeding the MAC was not impacted by the recommended sampling period used – morning or afternoon. However, sampling outside of the designated sampling periods did impact the number of samples exceeding the MAC. The unintentional result of samplers collecting samples outside the sampling times demonstrated our assumption the two

designated sampling periods represent periods in the day where lead concentrations would increase after a morning flush and lunch hour period.

Sample Period	Number of Samples Collected		
	Total	> MAC	%
0900 – 1100 hrs ✓	570	9	1.6
1100 – 1400 hrs ✖	550	1	0.1
1400 – 1600 hrs ✓	666	12	1.8

Table 2 - Samples per established time periods

Flushing Program

Water samplers asked licensees a set of questions about their morning water flushing procedures, including if flushing had occurred the morning of sampling. There were four responses recorded:

- *Yes*
- *No*
- *Unknown*
- *No Entry* (Blank)

The responses to the question about the presence of a flushing program involved the usual amount of time operators flushed their water fixture(s). For simplicity all responses involving time were entered as *YES* in Table 3.

	Flushed Sample Day?				
Flushing Program In Place?	Yes	No	Unknown	Blank	**Total**
Yes	1314	7	1	9	**1331**
No	28	23	1	1	**53**
Unknown	32	5	5	0	**42**
Blank	33	0	3	14	**50**
Total	**1407**	**35**	**10**	**24**	**1476**

Table 3 – Facility responses to Flushing Questions

Values to note:

- 1331 facilities (90%) have an established regular flushing program
- 1407 facilities (95%) flushed their water on the day of sampling

Interestingly, 28 facilities indicated *NO* to any flushing program being in place but still stated *YES* to flushing the fixture(s) prior to use that morning. There is no explanation for this. Apart from the definitive *YES / NO* answers, the staff in 42 facilities responded they do not know if they have a flushing program and a further 50 left that data field blank. We are assuming these 50 blank responses to be the same as unknown resulting in up to 92 (6%) facilities not being aware if a flushing program exists in their CCF.

5 - Discussion

Minimizing Intake of Lead

Licensees whose facilities had sample results exceeding the MAC were required to immediately stop using water from that fixture. SEHOs contacted the licensees to discuss how they would control the amount of lead in their facility's drinking water in the long term.

Table 3 details the additional control methods used by each licensee whose sample results exceeded the MAC. Some licensees required the use of multiple control methods to successfully mitigate elevated lead levels in their facility. All licensees were able to successfully mitigate elevated lead levels

Control Methods

The most common control method was:

- Eliminate (cease using) the fixture where the elevated lead level was detected, and use a fixture which tested below the MAC or a safe source of water as the primary water source.

The remaining control methods involved substitution or engineering controls which take time and resources to implement. Replacing the offending fixture with a new lead free unit was the simplest and most cost-efficient additional control method.

- Four licensees found that fixture replacement alone was inadequate to lower lead levels below the MAC. They installed Point Of Use lead reduction filter systems.
- One facility installed an automatic flushing device to the water lines.
- One facility changed the building's distribution lines.

SAMPLE CODE	CONTROL METHODS					
	Stop Use	Auto Flush	Fixture	Pb Filter	Piping	Closed *
SITE 01				✓		
SITE 02			✓	✓		
SITE 03		✓				
SITE 04	✓					
SITE 05				✓		
SITE 06						✓
SITE 07	✓					
SITE 08	✓				✓	
SITE 09	✓					
SITE 10	✓					
SITE 11	✓					
SITE 12	✓					
SITE 13			✓			
SITE 14			✓	✓		
SITE 15	✓					
SITE 16A	✓		✓	✓		
SITE 16B	✓		✓			
SITE 17				✓		
SITE 18A	✓					
SITE 18C	✓					
SITE 19	✓		✓	✓		✓
SITE 20	✓			✓		

Table 4 Control methods employed by licensees

Two facilities stopped operating prior resampling. These closures were already planned for and not a result of our survey. The results from all other facilities that had to resample were below the MAC.

Limitations with Single RDT Sampling

The information captured with RDT sampling is a "moment-in-time" result. Elevated lead levels do not imply every use of the fixture tested has or will always emit water with lead levels exceeding the MAC. Likewise, fixtures with lead levels below the MAC may have the potential, under different situations, to have lead levels exceeding the MAC.

Many factors contribute to the presence or absence of lead in drinking water. To fully understand the potential risks would require each CCF to undergo a detailed evaluation of their source water, building

plumbing and a more rigorous sampling program. Such an evaluation for a growing number of CCFs in VCH is not practical. Instead, all licensees, regardless of their water sample results, have been directed to continue employing means to reduce potential lead levels in their water, to minimize the potential lead levels in the drinking water.

6 – Conclusions

The intent of this survey was to see if the current flushing directive is effective in reducing lead levels throughout the day in each facility or if there needs to be additional measures taken by facility operators to better mitigate the risks from elevated lead levels in drinking water. The results of 1786 samples from 1476 facilities showing only 1.2% of the samples exceeded the MAC indicates that the current flushing directive has a positive effect in reducing lead levels in CCFs. Furthermore a total of 64% of the samples had no detectible lead levels in the drinking water complying with the ALARA statement.

The addition of sampling time periods to the RDT sampling protocol narrowing the randomness of the time samples were to be collected proved to be a valid addition to the protocol used in our survey. While this might not be the case for every survey utilizing RDT, it did compliment the intent of our survey.

It is recommended that LOs ensure licensees are continuously implementing or maintaining control measures to keep lead levels as low as reasonably achievable. Such a program would involve:

- New facilities testing fixtures intended for consumption for the presence of lead, and submitting the results as part of their application process
- Lead reduction information tailored to CCFs available for licensees
- LOs following up with licensees during routine inspections regarding their ongoing controls for lead reduction and continue to track in inspection reports

7 - Acknowledgements

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Mark Ritson
Gary Tam
Charlene Wood

Appendix 1

Field Sampling Data Sheet

Lead Sampling in Daycares 2022 - Stage 1 Field Sampling Data Sheet

Facility Name	
Hedgehog Facility #	
Type of facility (circle)	GROUP / FAMILY
Water source for facility	
Approx. age of building or year constructed	
Renovations done on plumbing? (what & when)	
Describe the normal flushing procedure in the facility	
Was the flushing procedure followed on the day of sampling?	YES / NO
Filters present – type / age? (Do not remove for sampling)	

Sample Date (MMM/dd/yyyy): Time of first sample (hh:mm):

Fixture	Sample Code # (on Facility Spreadsheet)	Location (if more than one Kitchen fixture)	Last Use (Approx Time)
Kitchen #1			
#2 (if required)			
#3 (if required)			

Water Temp (°C) of sample	KITCHEN #1_____ FIXTURE #2_____ FIXTURE #3_____
Additional comments	
Form completed by	
Caro COC Shipping Form#	(completed at office)

Use space to draw floorplan indicating sinks (if needed for clarity):

Appendix 2

Sampling Training; Powerpoint Slide Deck

VCH Childcare Facility
Lead-in-Water Sampling Project

STAGE 1 Sampling Procedures

Feb, 2022

SAMPLING … Why?

This study will aid in identifying and mitigating potential sources of Lead (Pb) exposure from water consumption in childcare facilities in the Vancouver Coastal Health region.

This survey is part of a BC-wide study funded by the BC Ministry of Health.

COLLECTION & TESTING

In this study water specimens will be collected by VCH staff and sent to a private laboratory (Caro Labs, Richmond, BC) for Lead ('Pb') analysis.

Caro Labs will be supplying:

1. Specimen bottles (250ml plastic)
2. Preservative (Nitric Acid)
3. Chain-of-Custody ('COC') forms
4. A small number of transport coolers (to be returned to Caro)

SAMPLING … Choice of Fixture

1. **What: only <u>Cold Water</u> used for <u>Consumption</u>**
   - Fixtures (sinks, drinking fountains) the CCF uses for water used for drinking and/ or food prep

2. **Fixture selection per CCF…** if they meet the **above** criteria:
   a) the **KITCHEN tap** should be sampled as the 1st specimen
   b) @Family-size CCF's: a 2nd fixture can be sampled,
   c) @Larger CCFs: up-to 3 fixtures in-total can be sampled

SAMPLING … When

During regular CCF operating days/ hours between:

a) **0900 – 1100 hrs** and
b) **1400 - 1600** hrs

…or another time that's convenient for the Operator

The CCF must have done their daily start-up water system flush before at least 30 min before a sample is collected.

Sample ID Codes

1. **2-3 pre-assigned Sample ID** Codes will be pre-assigned for each CCF (see the ***Facility Site List***)
2. Each sample must have:
   1. a ***unique*****,** pre-assigned Sample ID.
   2. Its unique Sample ID recorded on **both the**:
      - Specimen **Bottle label**, and the
      - **Chain-of-Custody** ('COC') sheet
3. Each Sample ID Code must be *used only once*
4. Do not re-use a Sample Code for another CCF or fixture.

Supplies & Equipment

On a sample collection trip take along:

- ❑ Safety/ PPE (gloves, eye protection,)

+ a copy of the Safety Data Sheet for Nitric Acid

- ❑ Sampling
- ❑ Admin (recording data)

… *as detailed in the Sampling Procedures document*


CALEDON

Safety Data Sheet

Nitric Acid

SECTION 1. IDENTIFICATION

SECTION 2. HAZARD IDENTIFICATION

Sampling… *Preparations*…

Fill-out the…**

1. Field Sampling Data sheet ❑one per CCF
2. Specimen bottle label ❑one per fixture sampled
3. Chain-of-Custody ('COC') form ❑one per up-to **12** specimens

**Record '*Sample ID*' &'*Time of Sampling*' at the time of sampling

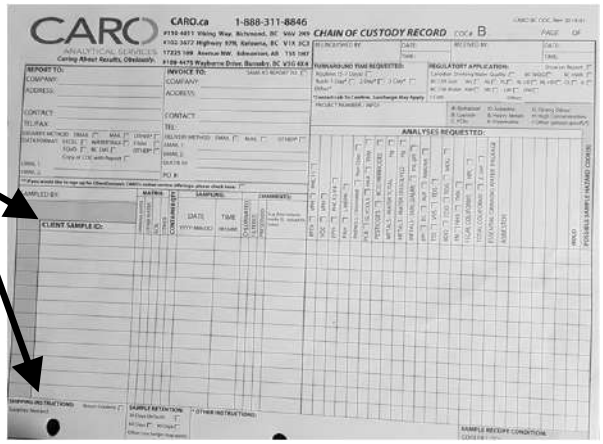
Documentation – 'COC' Form

A Chain-of-Custody ('COC') MUST accompany **ALL** specimens sent to the lab.

List **Sample IDs** @ Right Side

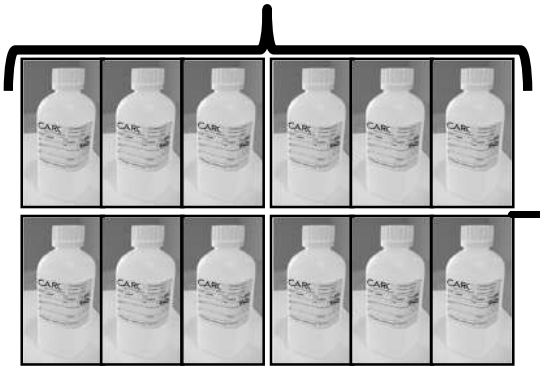
<u>Sample ID Code</u> MUST be on both the:

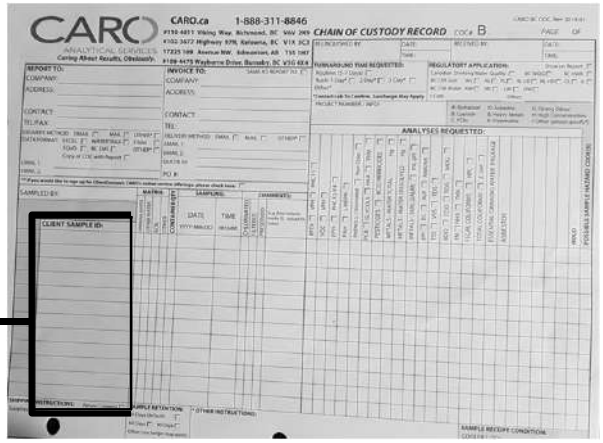
- **<u>COC form</u> AND**
- **<u>Sample label</u>**



Documentation – 'COC' Form

<u>One COC form</u> can be used for up to **<u>12 specimens</u>**

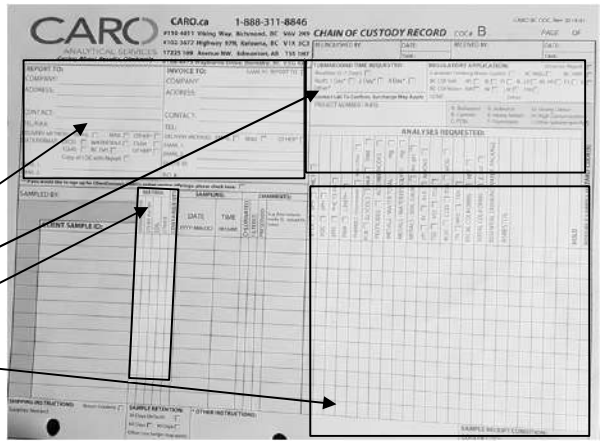




Documentation – 'COC' Form

COC forms for the VCH CCF Lab Survey will be available partially pre-filled-in, including the fields for:

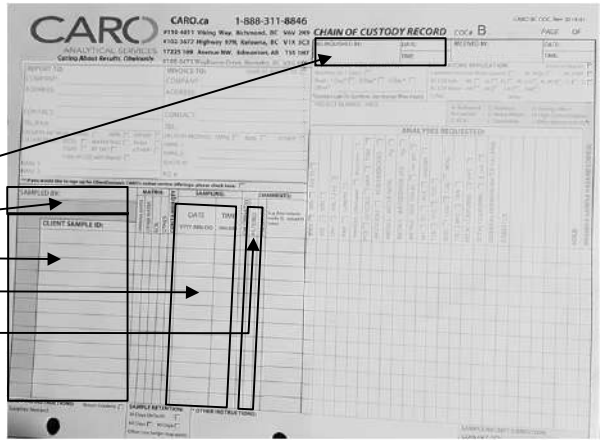
- **Account info/ contacts**
- **Project info**
- **'MATRIX' (Sample media)**
- **'Analysis request'**



Documentation – 'COC' Form_s3

Samplers must fill-out COC data fields for:

- **'Relinquished by' & Time**
- **'Sampled By'**
- **'Sample ID'**
- **'Sampling Date/Time'**
- **'Filtered' (yes = 'X')**



Documentation: Specimen bottle label

Labels must be filled-out with:

1. Date/time of collection
2. Preservative used (HNO_3) must be added by Sampler
3. Sample ID code
4. Site name/code
5. Project code (VCH-CCF-Pb)
6. Sampler/ Collector name

Field Sampling Data Sheet (Stage 1)

For each <u>facility</u> record a standard set of information about the location, eg:

1. Date & time of sampling
2. Name of sampler
3. Facility type, age, water system use
4. Presence of water filters
5. Location of the fixture(s) sampled
6. Sample ID code
7. Observations
   a) Water temps
   b) Other notes re: operation

Facility operator input will be needed for some details.

Field Sampling Data Sheet (Stage 1) – *Top 1/2*

APPENDIX 2A – Lead Sampling in Daycares 2022 - Stage 1 Field Sampling Data Sheet

Facility Name	
Hedgehog Facility #	
Type of facility (circle)	GROUP / FAMILY
Water source for facility	
Approx. age of building or year constructed	
Renovations done on plumbing? (what & when)	
Describe the normal flushing procedure in the facility	
Was the flushing procedure followed on the day of sampling?	YES / NO
Filters present – type / age? (Do not remove for sampling)	

Field Sampling Data Sheet (Stage 1)_*Lower 1/2*

APPENDIX 2A – Lead Sampling in Daycares 2022 - Stage 1 Field Sampling Data Sheet

Sample Date (MM/dd/yyyy):		Time of first sample (hh:mm):	
Fixture	Sample Code # (on Facility Spreadsheet)	Location (if more than one Kitchen fixture)	Last Use (Approx Time)
Kitchen #1			
#2 (if required)			
#3 (if required)			

Water Temp (°C) of sample	KITCHEN #1_____ FIXTURE #2_____ FIXTURE #3_____
Additional comments	
Form completed by	
Care COC Shipping Form#	(completed at office)

Use space to draw floorplan indicating sinks (if needed for clarity):

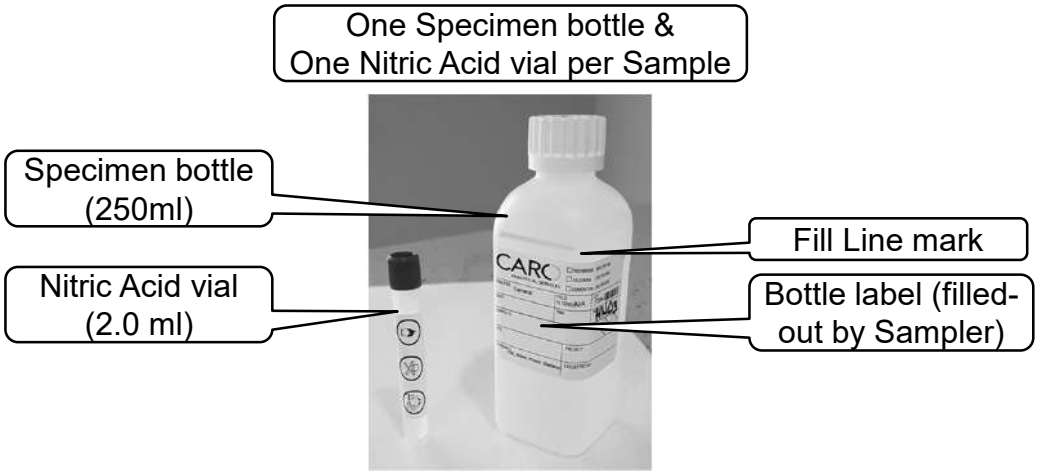
Specimen Bottles

Use **ONLY** the sample bottles & preservative provided by the testing Lab (Caro Labs –Richmond for this study):

1) Sample bottles (250 ml white-cap, labelled, sterile)
   - Keep them sealed until the time of collection
   - Do not rinse the bottles
   - Keep them clean

2) Preservative (Nitric acid 2.0ml vials)
   - Store the empty acid vial in the Ziploc bag

Specimen bottle and Preservative (HNO3)



Specimen Prep… Nitric Acid Addition

A small amount (2.0ml) of Nitric acid is to be added to each sample bottle **AFTER** collection of the water.

Using the PPE

1. add the full contents (2.0ml /~ ½ teaspoon) of one red-capped (screw-cap) vial of Nitric Acid to each sample,
2. Re-cap the Acid vial and store it in a plastic bag.
3. Re-cap the Specimen bottle and place it in the cooler
4. Rinse, dry and store the gloves

SAFETY NOTES … Nitric Acid (HNO_3)

1. ***Nitric Acid*** is toxic (if it contacts skin, eyes, mucous membranes), as well as corrosive, and potentially reactive/flammable.
2. **Personal Protective Equipment (PPE)** must worn when handling Nitric Acid, including:
   - ➢Gloves (approved for acids/ corrosives)… snug-fitting is best
   - ➢Eye protection
     - Safety glasses
     - An eye-wash station/ bottle must be on-hand whenever handling Nitric Acid

SAFETY NOTES … Nitric Acid Handling/ 1st Aid

1. FIRST AID:
   - Immediately rinse the exposed area with tap water, taking care to not to splash water/ acid around
   - If hospital treatment is required take a copy of the Nitric Acid *SDS* to the hospital for Care Staff information
2. See the Nitric Acid ***Safety Data Sheet (SDS)*** for more information

SAFETY NOTES … Spill Clean-ups… Nitric Acid

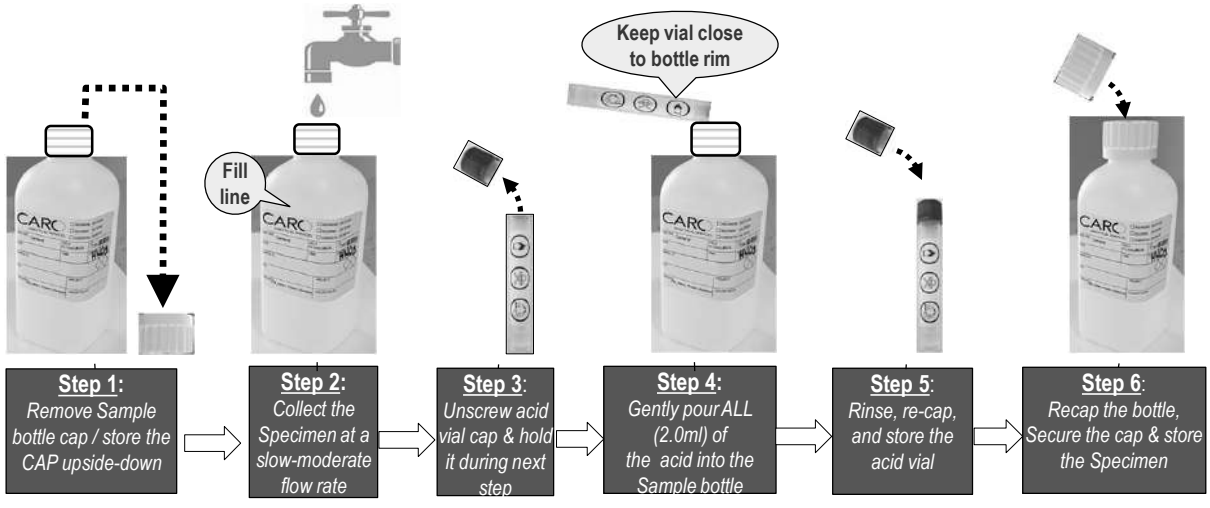
1. Rinse surfaces (countertops, sinks, floors) exposed to drips, splashes or other contact with the acid
2. After sample collection rinse sinks for 10-15 sec with water
3. Remove immediately any clothing and footwear exposed to Nitric Acid
4. Avoid touching face, eyes, skin while handling the acid.
5. Be careful handling acid vials even once emptied as small droplets of acid may adhere to the vial surfaces.

Sample Collection … Preparations

Sample collection

a) Sampling **must not be done** unless the CCF Operator has done the routine daily start-up flush of the water system at least 30 min prior to sample collection.
b) Aerators & filters (including Pb) should remain in place
c) Keep the sample bottle sealed until time of collection
d) Do not rinse the sample bottle

Sample Collection: Steps *(as pix)*



Specimen Collection Steps *(as text)*

Step 1 *Remove Sample bottle cap / store the CAP upside-down*

Step 2 *At a slow-moderate flow rate, collect the 1st water out of the fixture*

Step 3 *Unscrew Acid vial cap & hold it*

Step 4 *Gently pour ALL of the Acid into the Sample bottle*

Step 5 *Rinse, re-cap, and store the Acid vial*

Step 6 *Recap the bottle, secure the cap & store the Specimen*

SAMPLING… Post-collection

1. Rinse out the sink/ fixture
2. Rinse off and surrounding bench
3. Rinse off the gloves used for handling the acid
4. Complete the Field Sampling Data Sheet
5. Transport the samples back to the office and hand them over to EHO or Admin staffer managing shipment to the Lab

APPENDICES:

1. Sampling Procedures Guide field copy (2pp)
2. Supplies & Equipment Checklist (see PDF/paper copy)
3. Office Admin Info
   a) Shipping Specimens to the Lab
   b) Shipping Contacts

Appendix: Sampling Procedures Guide

Sampling Procedures Guide (2pp)

– See the PDF/ paper copy

Appendix: Supplies & Equipment

- ❑ PPE
  - ❑Gloves (non-absorbent, non-latex)
  - ❑Eye protection,
  - ❑Eye wash bottle/station
- ❑ VCH Employee photo ID
- ❑ Facility list
- ❑ Field Sampling Data Sheets [*one per CCF*]
- ❑ Thermometers [2 or more]
- ❑Chain-of-Custody ('COC') form(s)
- ❑Specimen bottles [up to **3** per CCF]
- ❑Nitric Acid vials [one per Specimen bottle]
- ❑Small cooler [one, no ice pack required]
- ❑Ziploc bag to store emptied Nitric Acid vials
- ❑Fine-point permanent ink pen (e.g. Sharpie) /recommended for filling-out bottle labels

Appendix: Shipping Specimens to the Lab

Once a number of samples (up to a few dozen) have been collected the batch can be sent to Caro Lab for analysis.

1. Chain of Custody forms must be complete and copies are to be:
   a) Sent to the Lab with the shipment, and
   b) Kept for office records

2. Used Nitric Acid vials:

   ➢ See info-sheet: 'Disposal of Used Nitric Acid Vials'

Appendix: Shipping Contacts

Check with the Senior Environmental Health Officer assigned to this project for further details on shipping arrangements to get the specimens to the Lab.

Appendix 3

Sampling Instruction Sheet

CHILDCARE FACILITIES LEAD SAMPLING PROJECT – STAGE 1 DIRECTIONS

The intent of this 2 page document is to provide direction to persons directly involved in the process of collecting Stage 1 drinking water samples in licenced childcare facilities for the purposes of testing for Lead content. This is a follow-up to the sampling conducted in 2012, to review the effect of flushing on Lead concentrations in daycare drinking water systems using a Random Day Time (RDT) sampling procedure.

SAFETY NOTES:

- The water sampling bottles requires the addition of a small pre-portioned volume of nitric acid (HNO_3) - a corrosive & poisonous substance - to be performed immediately after collecting sample.
- Additional PPE - gloves, eye protection - should be worn while sampling.
- Once the nitric acid has been added to the water sample there is no longer a safety hazard.
- Please refer to the Safety Data Sheet emailed to you and posted at HNO_3 supply.

EQUIPMENT:

Prior to departing your office to sample you will require the following items:

1. Facilities Site List for the places to be sampled – will be sorted by postal code.
2. Field Sampling Data Sheet – blank sheet for each facility.
3. 250mL Pb sample bottles - one per sample with a potential average of 2 samples per facility.
4. HNO_3 agent – one vial per sample bottle
5. Small cooler (ice packs NOT req'd) to safely transport bottles and HNO_3
6. Thermometers – at least two
7. PPE – snug fitting gloves, eye protection, eye rinse bottle
8. VCH employee photo identification

RDT SAMPLING PROTOCOL:

- Samples should be collected between the hours of 0900-1100 and 1400-1600.
- There is no flushing or stagnation period immediately prior sampling. Facility must have conducted their normal morning flush as directed. If not, then sampling will need to be conducted another day
- All aerators and filters (including Pb reduction filters) are to remain on the fixture.
- Only cold water fixtures used for consumption and/or food preparation are to be sampled.
- Kitchen sink is the primary site that must be sampled at all facilities.
- The number of potential samples per site will vary based on the type of facility and is noted on the Facility Site List.
- Family style facilities may have one additional fixture sampled if regularly used for consumption.
- Group style facilities may have two additional fixtures sampled if regularly used for consumption.
- Each facility will have either 2 or 3 preassigned Sample Codes found on the Facilities Site List.
- Each water sample must utilize one of the preassigned water sample codes for that facility.
- A water sample code must only be used once; every sample will use a different Sampling Code.
- The same Sample Code must be indicated on BOTH the sample bottle and Field Sampling Data sheet.
- Never utilize a code assigned to another facility once you have used the 2 or 3 codes assigned.
- Details of the location of the sink (especially if more than one sink is sampled it must be clear to someone else not familiar with the facility, with no floor plan, just your list of names/descriptions).
- If there are additional sinks beyond the 2 or 3 you feel could be tested make note on the Field Sampling Data Sheet of them and their location.
- Each collected sample requires the immediate and careful addition of HNO_3 to be done on site requiring the use of PPE and having eye wash bottle on standby.
- Samples with the addition of HNO_3 do not require temperature control or have a strict time constraint to get to lab however recommend shipping within a week after collecting.

FIELD SAMPLING STEPS:

- Facility information including the Sample Code found on the Facility Site List provided to you.
- Field Sampling Data Sheet will be used to document the samples collected - one sheet per facility.
- Field Sampling Data Sheet has some fields which will require assistance from the licensee to the best of their ability and knowledge.
- Prior to collecting the sample, enter the following on the bottle ***Sample Code, Date & Time, Name***.
- Will also need to indicate on the bottles:
  - ***HNO_3*** in the PRES[erve] field to indicate a preserve has been used
  - ***Fixture #*** in the SITE field
  - ***VCH CC Pb*** in the PROJECT field

Facility Name	
Hedgehog Facility #	
Type of facility (circle)	GROUP / FAMILY
Water source for facility	
Approx. age of building or year constructed	
Renovations done on plumbing? (what & when)	
Describe the normal flushing procedure in the facility	
Was the flushing procedure followed on the day of sampling?	YES / NO
Filters present – type / age? (Do not remove for sampling)	

Sample Date (MMM/dd/yyyy):		Time of first sample (hh:mm):	

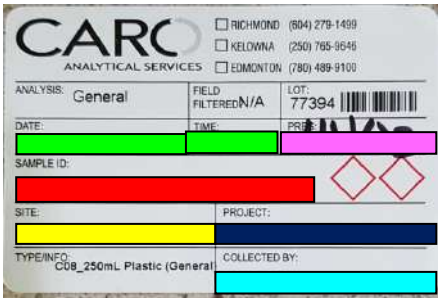
Fixture	Sample Code # (on Facility Spreadsheet)	Location (if more than one Kitchen fixture)	Last Use (Approx Time)
Kitchen #1			
#2 (if required)			
#3 (if required)			

Water Temp (°C) of sample	KITCHEN #1_____ FIXTURE #2_____ FIXTURE #3_____
Additional comments	
Form completed by	

Field Data Sheet

Fields on Bottle Label & Form

Date and Time
HNO_3 - same for all samples
Sample Code
Fixture #
VCH CC Pb – same for all samples
Your Name



Sample Bottle Label

- Ensure the sample bottle is open and ready before you begin sampling. Do not rinse the bottles prior to use or allow the water to overfill or splash out while collecting sample.
- A Sample will be collected as follows:
  - Sample the cold-water fixture
  - Must include the first water that comes out of the tap with a slow-moderate flow rate
  - Fill the sample bottle using a single continuous draw
- Immediately after taking the sample and with the sample bottle in the sink basin, carefully add the entire contents of HNO_3 vial into the sample bottle and recap both.
- Ensure the sink and surrounding countertops are flushed/wiped with water to mitigate any potential spills of the HNO_3.
- In addition to collecting samples, the water temperature of the sample(s) needs to be recorded immediately after collecting the sample.
- Ensure the thermometer is rinsed after use with distilled water and wiped dry.
- Complete all relevant sections of the Field Data Sheet.
- Once back in the office hand over the samples and Field Sampling Data Sheets to the SEHO Project Lead / assigned Admin Support for your office or follow alternate procedures established for rural offices.

SAFETY DATA SHEET

Creation Date 12-Mar-2009 **Revision Date** 25-Apr-2019 **Revision Number** 10

1. Identification

Product Name **Nitric acid (65 - 70%)**

Cat No. : **A198C-212, A200-212, A200-212LC, A200-500, A200-500LC, A200-612GAL, A200C-212, A200S-212, A200S-212LC, A200S-500, A200SI-212, A467-1, A467-2, A467-250, A467-500, A483-212; S719721**

CAS No 7697-37-2
Synonyms Azotic acid; Engraver's acid; Aqua fortis

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company
Fisher Scientific Company
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Oxidizing liquids	Category 3
Corrosive to metals	Category 1
Acute Inhalation Toxicity - Vapors	Category 3
Skin Corrosion/Irritation	Category 1 A
Serious Eye Damage/Eye Irritation	Category 1

Label Elements

Signal Word
Danger

Hazard Statements

May intensify fire; oxidizer
May be corrosive to metals
Causes severe skin burns and eye damage
Toxic if inhaled
Corrosive to the respiratory tract

Precautionary Statements
Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep/Store away from clothing/ other combustible materials
Take any precaution to avoid mixing with combustibles
Keep only in original container
Wear respiratory protection
Response
Immediately call a POISON CENTER or doctor/physician
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a POISON CENTER or doctor/physician
Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Ingestion
IF SWALLOWED: Rinse mouth. DO NOT induce vomiting
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Spills
Absorb spillage to prevent material damage
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Store in a dry place
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Corrosive to the respiratory tract

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Nitric acid	7697-37-2	65 - 70
Water	7732-18-5	30 - 35

4. First-aid measures

General Advice
Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Call a physician immediately.

Inhalation
If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Remove from exposure, lie down. Call a physician immediately.

Ingestion
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Clean mouth with water. Call a physician immediately.

Most important symptoms and effects
Causes burns by all exposure routes. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated

Notes to Physician
Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media
CO_2, dry chemical, dry sand, alcohol-resistant foam.

Unsuitable Extinguishing Media
No information available

Flash Point
Not applicable
Method -
No information available

Autoignition Temperature
No information available
Explosion Limits
Upper
No data available
Lower
No data available
Oxidizing Properties
Oxidizer

Sensitivity to Mechanical Impact
No information available
Sensitivity to Static Discharge
No information available

Specific Hazards Arising from the Chemical
Thermal decomposition can lead to release of irritating gases and vapors. The product causes burns of eyes, skin and mucous membranes. Oxidizer: Contact with combustible/organic material may cause fire. May ignite combustibles (wood paper, oil, clothing, etc.).

Hazardous Combustion Products
Nitrogen oxides (NOx). Thermal decomposition can lead to release of irritating gases and vapors.
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

Health	Flammability	Instability	Physical hazards
4	0	0	OX

6. Accidental release measures

Personal Precautions Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Use personal protective equipment as required.

Environmental Precautions Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional Ecological Information.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Sweep up and shovel into suitable containers for disposal. Wear self-contained breathing apparatus and protective suit.

7. Handling and storage

Handling Use only under a chemical fume hood. Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Do not ingest. If swallowed then seek immediate medical assistance. Do not breathe mist/vapors/spray. Keep away from clothing and other combustible materials.

Storage. Keep containers tightly closed in a cool, well-ventilated place. Do not store near combustible materials. Incompatible Materials. Combustible material. Strong bases. Reducing Agent. Metals. Finely powdered metals. Organic materials. Aldehydes. Alcohols. Cyanides. Ammonia. Strong reducing agents.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Nitric acid	TWA: 2 ppm STEL: 4 ppm	(Vacated) TWA: 2 ppm (Vacated) TWA: 5 mg/m^3 (Vacated) STEL: 4 ppm (Vacated) STEL: 10 mg/m^3 TWA: 2 ppm TWA: 5 mg/m^3	IDLH: 25 ppm TWA: 2 ppm TWA: 5 mg/m^3 STEL: 4 ppm STEL: 10 mg/m^3	TWA: 2 ppm STEL: 4 ppm

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: NIOSH - National Institute for Occupational Safety and Health

Engineering Measures Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Tight sealing safety goggles. Face protection shield.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Keep away from food, drink and animal feeding stuffs. When using do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Provide regular cleaning of equipment, work area and clothing. Avoid contact with skin, eyes or clothing. Remove and wash contaminated clothing and gloves, including the inside, before

re-use. Wear suitable gloves and eye/face protection.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Clear Colorless, Light yellow
Odor	Strong Acrid
Odor Threshold	No information available
pH	< 1.0 (0.1M)
Melting Point/Range	-41 °C / -41.8 °F
Boiling Point/Range	Not applicable
Flash Point	Not applicable
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	0.94 kPa (20°C)
Vapor Density	No information available
Specific Gravity	1.40
Solubility	miscible
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	HNO3
Molecular Weight	63.01

10. Stability and reactivity

Reactive Hazard Yes

Stability Oxidizer: Contact with combustible/organic material may cause fire.

Conditions to Avoid Incompatible products. Combustible material. Excess heat. Exposure to air or moisture over prolonged periods.

Incompatible Materials Combustible material, Strong bases, Reducing Agent, Metals, Finely powdered metals, Organic materials, Aldehydes, Alcohols, Cyanides, Ammonia, Strong reducing agents

Hazardous Decomposition Products Nitrogen oxides (NOx), Thermal decomposition can lead to release of irritating gases and vapors

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Oral LD50	Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.
Dermal LD50	Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.
Mist LC50	Category 3. ATE = 1 - 5 mg/l. Category 4.
Vapor LC50	Based on ATE data, the classification criteria are not met. ATE > 20 mg/l.

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Nitric acid	Not listed	Not listed	LC50 = 2500 ppm, (Rat) 1h
Water	-	-	-

Toxicologically Synergistic No information available

Products

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Causes severe burns by all exposure routes

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
Nitric acid	7697-37-2	Not listed	Not listed	Not listed	Not listed	Not listed
Water	7732-18-5	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known
STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains. Large amounts will affect pH and harm aquatic organisms.

Persistence and Degradability Miscible with water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubility.

Component	log Pow
Nitric acid	-2.3

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN2031
Proper Shipping Name NITRIC ACID
Hazard Class 8
Subsidiary Hazard Class 5.1
Packing Group II

TDG

UN-No	UN2031
Proper Shipping Name	NITRIC ACID
Hazard Class	8
Subsidiary Hazard Class	5.1
Packing Group	II

IATA

UN-No	UN2031
Proper Shipping Name	NITRIC ACID
Hazard Class	8
Subsidiary Hazard Class	5.1
Packing Group	II

IMDG/IMO

UN-No	UN2031
Proper Shipping Name	NITRIC ACID
Hazard Class	8
Subsidiary Hazard Class	5.1
Packing Group	II

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active/Inactive	TSCA - EPA Regulatory Flags
Nitric acid	7697-37-2	X	ACTIVE	-
Water	7732-18-5	X	ACTIVE	-

Legend:
TSCA - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

Component	CAS No	DSL	NDSL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
Nitric acid	7697-37-2	X	-	231-714-2	X	X	X	X	X	KE-25911
Water	7732-18-5	X	-	231-791-2	X	X		X	X	KE-35400

U.S. Federal Regulations

SARA 313

Component	CAS No	Weight %	SARA 313 - Threshold Values %
Nitric acid	7697-37-2	65 - 70	1.0

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Nitric acid	X	1000 lb	-	-

Clean Air Act Not applicable

OSHA - Occupational Safety and Health Administration

Component	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Nitric acid	-	TQ: 500 lb

CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Nitric acid	1000 lb	1000 lb

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Nitric acid	X	X	X	X	X
Water	-	-	X	-	-

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security This product contains the following DHS chemicals:
Legend - STQs = Screening Threshold Quantities, APA = A placarded amount

Component	DHS Chemical Facility Anti-Terrorism Standard
Nitric acid	Release STQs - 15000lb Theft STQs - 400lb

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 12-Mar-2009
Revision Date 25-Apr-2019
Print Date 25-Apr-2019
Revision Summary SDS sections updated. 2. 11.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

Appendix 4

Correspondences with Licensee; Pre-Sampling

Health Protection
Coast Garibaldi Office Box1040 5571 Inlet Ave., Tel 1604-885-5164, Fax 1604-885-9725
North Vancouver Office 132 W Esplanade, Tel 604-983-6700, Fax 604-983-6702
Richmond Office 8100 Granville, Tel 604-233-3147, Fax 604-233-3175
Vancouver Office 1200–601 West Broadway, Tel 604-675-3800, Fax 604-736-8651
Squamish Office Box220 1140 Hunter Pl., Tel 1604-892-2293, Fax 1604-892.2327

Lead testing of drinking water
FAQ for Licensed Child Care Facilities in the VCH region
Published on: February 15th, 2022

Why is VCH testing lead levels in all licensed child care facilities?
Vancouver Coastal Health (VCH) is currently working with child care licensees in support of a directive by the BC Ministry of Health and Provincial Health Officer to conduct a survey and test the lead levels in the drinking water of all licensed child care facilities operating in our region.

What is the importance of monitoring lead levels in drinking water?
Exposure to lead in drinking water can cause negative health effects if left undetected and unmanaged. The issue of lead in drinking water can occur in homes, schools and other settings throughout British Columbia, Canada and worldwide. Lead was once a commonly used material in the plumbing of buildings. When water sits in building piping, lead can be released from the plumbing into the water. It is difficult to predict which facilities may have elevated levels of lead based on the age of the building, or maintenance and renovation history. This is why public health is sampling and analyzing water quality of individual facilities to reduce the risk of potential negative health effects associated with lead exposure.

What is a safe level?
While lead levels should be as low as reasonably achievable, Health Canada has set the maximum acceptable concentration (MAC) of lead in drinking water to 5 parts per billion. If lead levels in drinking water are higher than the MAC, actions can be taken to reduce the risk of negative effects, including testing the drinking water and taking measures to reduce lead levels.

What are the health concerns?
The health impact of lead exposure depend on many factors including the amount and length of exposure, age, nutrition and underlying health issues. According to Health Canada, low levels of lead exposure over a period of time can be harmful to health, especially for young children and for normal fetal development. People may ingest lead from many sources, such as food, drinking water, soil, paint, and dust. Further information is available on **HealthLink BC.**

What if the lead levels in the drinking water of a childcare facility are high?
Currently all licensed child care facilities within the VCH region are required to flush cold water taps used for drinking or food preparation for one to five minutes, or until the water runs cold. Should a facility have high lead levels in their sample, the licensee will be required to review options to reduce the lead level, with support from VCH Health Protection. These options may include additional flushing; replacement of specific taps, components or pipes; use of filters approved for the removal of lead; or other evidence-based approaches. An Environmental Health Officer or Licensing Officer may repeat water testing once these interventions have been implemented to ensure a sustained reduction in lead levels.

Should my child have blood testing done?
The detection of lead in a child care facility's drinking water does **not** mean that blood testing is required. Testing should be based on the recommendations of an individual's health care provider, or public health programs. The most important thing to do is identify and remove all suspected sources of lead exposure. Anyone who has concerns or questions can visit Health Link BC or contact our Health Protection program for further information.

Additional Resources
Lead in Drinking Water: https://www.healthlinkbc.ca/healthlinkbc-files/lead-drinking-water
Lead paint and Hazards: https://www.healthlinkbc.ca/healthlinkbc-files/lead-paint-and-hazards
Lead Poisoning: https://www.healthlinkbc.ca/health-topics/lead-poisoning

Office of the Chief Medical Health Officer
800, 601 West Broadway
Vancouver, BC V5Z 4C2
Tel: 604.675.3900 Toll free 1.855.675.3900
Fax: 604.731.2756

Lead in Drinking Water

Lead is harmful to human health. Health impacts include effects on neurological development and behaviour in children and increased blood pressure and kidney issues in adults. Lead exposure can impact the health of everyone, but lead is more of a risk for pregnant women and young children because infants and children absorb lead more easily than adults and are more susceptible to its harmful effects, such as effects on behaviour and intelligence. The public's overall exposure to lead has decreased over the years as some major sources of lead have been eliminated. However building plumbing systems can still be a source of lead for people consuming the water (in addition to other sources such as food, soil, paint and dust). When there is a risk of lead being present in a buildings water system, steps can be taken to reduce exposure to lead from the drinking water.

What is a safe level?

Health Canada has reduced the maximum acceptable concentration of lead in drinking water to 5 parts per billion while at the same stating that lead levels should be as low as reasonably achievable. There is no known safe level of lead exposure.

What can I do?

The BC Ministry of Health document titled *Lead in Drinking Water* provides details on the issue and steps that can be taken to reduce lead levels in your drinking water:

https://www.healthlinkbc.ca/hlbc/files/documents/healthfiles/hfile49e.pdf

Health Canada's document titled: *Drinking water: what about lead?* provides similar details as well as a good description of the sources of lead within a building's plumbing system:

https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/pubs/what-about-lead/drinking-water-lead-eng.pdf

Water in Daycares and Homes with Infants

Infants are vulnerable to the effects of lead exposure, and could be highly exposed if they are consuming formula made with tap water from a building plumbing system with lead. Reduction of lead levels by flushing water lines may not be enough to adequately reduce the risk to infants. Additional steps such as the use of filters capable of removing lead or an alternate water source known to be lead free may be required to adequately mitigate the risks.

For licenced daycares VCH staff will work with facility operators to ensure that lead removal procedures are being employed and managed properly.

Office of the Chief Medical Health Officer
800, 601 West Broadway
Vancouver, BC V5Z 4C2
Tel: 604.675.3900 Toll free 1.855.675.3900
Fax: 604.731.2756

Testing in schools

Drinking water testing for lead is required in school buildings.
For more details see the Ministry of Education & Training website:

https://www2.gov.bc.ca/gov/content/education-training/k-12/administration/legislation-policy/public-schools/testing-lead-content-in-drinking-water?keyword=lead&keyword=testing

Additional Resources

Health Canada's Water Talk - The guideline for lead in drinking water:

https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/water-talk-minimizing-exposure-lead-drinking-water-distribution-systems.html#s5

Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Lead:

https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-lead.html

Canadian water & Wastewater Association - Fact Sheet on LEAD (Pb)

http://www.cwwa.ca/pdf_files/CWWA_Lead%20_Facts_2019.pdf

Contact information for Vancouver Coastal Health Environmental Health:

Area	Phone Number
Central Coast	604-983-6700
North Vancouver	604-983-6700
Powell River	604-485-3310
Richmond	604-233-3147
Sechelt	604-885-5164
Squamish	604-892-2293
Vancouver	604-675-3800
Whistler	604-932-3202

Appendix 5

Correspondences with Licensee;

Results Below MAC Level

Health Protection
Coast Garibaldi Office Box1040 5571 Inlet Ave., Tel 1604-885-5164, Fax 1604-885-9725
North Vancouver Office 132 W Esplanade, Tel 604-983-6700, Fax 604-983-6702
Richmond Office 8100 Granville, Tel 604-233-3147, Fax 604-233-3175
Vancouver Office 1200–601 West Broadway, Tel 604-675-3800, Fax 604-736-8651
Squamish Office Box220 1140 Hunter Pl., Tel 1604-892-2293, Fax 1604-892.2327

Dear Licensee

Re: Drinking Water Sample Result Lead

Vancouver Coastal Health Child Care Licensing appreciates your participation and time regarding the lead in drinking water sampling project.

The sample result for the water used for drinking or food preparation in your facility is below the Guideline for Canadian Drinking Water Quality maximum allowable concentration (MAC) of 5 parts per billion (<0.005 mg/L). Please continue with your current lead mitigation practices, whether that be daily cold water line flushing procedures, filtration or treatment devices.

If you have questions in this matter please contact your Licensing Officer.

Sincerely,

Nader Massoud
Regional Manager, Community Care Facilities Licensing
Vancouver Coastal Health

Health Protection
Coast Garibaldi Office Box1040 5571 Inlet Ave., Tel 1604-885-5164, Fax 1604-885-9725
North Vancouver Office 132 W Esplanade, Tel 604-983-6700, Fax 604-983-6702
Richmond Office 8100 Granville, Tel 604-233-3147, Fax 604-233-3175
Vancouver Office 1200–601 West Broadway, Tel 604-675-3800, Fax 604-736-8651
Squamish Office Box220 1140 Hunter Pl., Tel 1604-892-2293, Fax 1604-892.2327

Resources:

- VCH FAQ for Licensed Childcare Facilities within the VCH region; http://www.vch.ca/Documents/Lead-testing-of-drinking-water-FAQ.pdf
- VCH Lead in Drinking Water; http://www.vch.ca/Documents/Lead-in-drinking-water.pdf
- Government of British Columbia (2019). Guidelines On Evaluating And Mitigating Lead In Drinking Water Supplies, Schools, Daycares And Other Buildings; 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
- Government of British Columbia (2019). HealthLinkBC File Number 49e: Lead in Drinking Water https://www.healthlinkbc.ca/healthlinkbc-files/lead-drinking-water
- NSF certified lead reduction filters: https://www.nsf.org/consumer-resources/articles/lead-drinking-water
- Government of British Columbia (2017). Community Care and Assisted Living Act – Lead in Drinking Water; https://www2.gov.bc.ca/assets/gov/health/about-bc-s-health-care-system/child-day-care/fact_sheet_-_lead_in_drinking_water_2017.pdf

Appendix 6

Correspondences with Parents; Results Below MAC

Health Protection
Coast Garibaldi Office Box1040 5571 Inlet Ave., Tel 1604-885-5164, Fax 1604-885-9725
North Vancouver Office 132 W Esplanade, Tel 604-983-6700, Fax 604-983-6702
Richmond Office 8100 Granville, Tel 604-233-3147, Fax 604-233-3175
Vancouver Office 1200–601 West Broadway, Tel 604-675-3800, Fax 604-736-8651
Squamish Office Box220 1140 Hunter Pl., Tel 1604-892-2293, Fax 1604-892.2327

Date:

Dear Parents and Guardians,

Re: Drinking Water Sample Result

As you may be aware, Vancouver Coastal Health (VCH), in collaboration with licensee has, tested the water in your child's daycare for lead concentration. This is part of a larger B.C. Ministry of Health initiative to test the water in all licensed childcare facilities for lead; this work was undertaken to confirm that the concentration is below federal guideline levels.

Drinking water testing is now complete, and we would like to inform you that test results for your child's daycare facility indicated a concentration below Health Canada's guideline and no follow-up actions are required.

VCH continues to encourage parents of young children to be aware of and address other potential sources of lead exposure in their home such as plumbing, chipping paint, and hobbies such as designing stained glass, that may involve lead. More information on reducing your exposure to lead can be found here: www.canada.ca/en/health-canada/services/home-garden-safety/reduce-your-exposure-lead.html.

Additional information on this screening initiative is available on the VCH website:

- VCH FAQ for Licensed Childcare Facilities within the VCH region: www.vch.ca/Documents/Lead-testing-of-drinking-water-FAQ.pdf
- VCH Lead in Drinking Water: www.vch.ca/Documents/Lead-in-drinking-water.pdf

We appreciate your attention to this matter.

Appendix 7

Correspondences with Licensee; Results Above MAC

Vancouver Coastal Health
Promoting wellness. Ensuring care.

Dear Licensee

Re: Drinking Water Sample Result Lead

Vancouver Coastal Health Child Care Licensing appreciates your cooperation and time regarding the lead in drinking water sampling project.

The initial test result for your facility drinking water is above the Guideline for Canadian Drinking Water Quality maximum allowable concentration (MAC) of 5 parts per billion (> 0.005 mg/L). The result indicates that the morning daily flushing of the tap does not mitigate the lead concentration in the facility drinking water.

An Environmental Health Officer (EHO) or Drinking Water Officer (DWO) from Vancouver Coastal Health will be in contact with you about follow-up actions that you need to take. Follow-up actions could include further testing to determine the source of the lead and replacement of those plumbing pieces (i.e. fixture) or the addition of a filtration system. The attached document describes some of the possible options for mitigation.

Please note that it is ultimately the responsibility of the licensee to ensure that safe drinking water is available to children as per section 48 (5) of the Child Care Licensing Regulation, but we encourage you to talk with your EHO or DWO below before taking further action.

Please contact your local Environmental Health Officer in the VCH office closest to you from the list below to discuss your situation in more detail:

Area	email	Phone Number
Central Coast RD	gary.tam@vch.ca	604 983 - 6813
North Vancouver	gary.tam@vch.ca	604 983 - 6813
Powell River	darren.molder@vch.ca	604 885 - 8711
Richmond	samson.wong@vch.ca	604 233 - 3193
Sechelt	darren.molder@vch.ca	604 885 - 8711
Squamish	dan.glover@vch.ca	604 815 - 6846
Vancouver	EHVC@vch.ca	604 675 - 3800
Whistler	dan.glover@vch.ca	604 815 - 6846

Sincerely

Nader Massoud
Regional Manager, Community Care Facilities Licensing
Vancouver Coastal Health

Resources:

- VCH FAQ for Licensed Childcare Facilities within the VCH region; http://www.vch.ca/Documents/Lead-testing-of-drinking-water-FAQ.pdf
- VCH Lead in Drinking Water; http://www.vch.ca/Documents/Lead-in-drinking-water.pdf
- Government of British Columbia (2019). Guidelines On Evaluating And Mitigating Lead In Drinking Water Supplies, Schools, Daycares And Other Buildings; 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
- Government of British Columbia (2019). HealthLinkBC File Number 49e: Lead in Drinking Water https://www.healthlinkbc.ca/healthlinkbc-files/lead-drinking-water
- NSF certified lead reduction filters: https://www.nsf.org/consumer-resources/articles/lead-drinking-water
- Government of British Columbia (2017). Community Care and Assisted Living Act – Lead in Drinking Water; https://www2.gov.bc.ca/assets/gov/health/about-bc-s-health-care-system/child-day-care/fact_sheet_-_lead_in_drinking_water_2017.pdf

High lead results? What's next?

The options below provide some initial information on the next steps to determine what remediation approach to take. This initial information is meant to supplement your conversation with your EHO or DWO.

Two approaches can be taken for remediation:

Option 1: Install a lead reduction filter at the tap and create a schedule to replace this filter regularly.

This option will need to include:

- The installation of filtration systems (carbon-based, reverse osmosis or distillation type filters certified to the NSF standard for lead removal. https://www.nsf.org/consumer-resources/articles/lead-drinking-water
- The creation of a schedule to regularly track the filter replacement and ensure records are kept for review

Option 2: Conduct follow-up lead testing to determine the sources of the lead for plumbing replacement or if additional flushing at each use will be effective.

Your EHO or DWO will provide information on the sampling methods that are recommended.

Depending on the sampling results, the recommended remediation may include:

- Replacement of specific faucets and/or components. Recommend you consult with a plumbing or water treatment company before any upgrading
- Flushing the cold water fixtures for at least 15 seconds before every use in addition to morning flushing.
- The installation of filtration systems (carbon-based, reverse osmosis or distillation type filters certified to the NSF standard for lead removal (see link below).

For both of these remediation options final **follow-up testing** will be required after the remediation actions has been implemented to ensure that lead levels have been effectively reduced.

*Note:

- Boiling water will not remove lead and may actually increase lead concentration in the water.
- Water from a hot water fixture is NEVER to be used for consumption or food preparation.

Appendix 8

Correspondences with Parents; Results Above MAC

Health Protection
Coast Garibaldi Office Box1040 5571 Inlet Ave., Tel 1604-885-5164, Fax 1604-885-9725
North Vancouver Office 132 W Esplanade, Tel 604-983-6700, Fax 604-983-6702
Richmond Office 8100 Granville, Tel 604-233-3147, Fax 604-233-3175
Vancouver Office 1200–601 West Broadway, Tel 604-675-3800, Fax 604-736-8651
Squamish Office Box220 1140 Hunter Pl., Tel 1604-892-2293, Fax 1604-892.2327

Date:

Dear Parents, Guardians

Re. Drinking Water Sample Result

As you may be aware, Vancouver Coastal Health (VCH), in collaboration with licensee has tested the drinking water in your child's daycare for lead concentration. This is part of a larger B.C. Ministry of Health's initiative to test the water of all licensed childcare facilities for lead; this work was undertaken to confirm that the concentration is below guideline levels. Drinking water testing is now complete, and we are writing to inform you that results for your childcare facility was above the Health Canada guideline. Note, that this was one sample taken at one point in time and therefore does not mean that each time water is taken from the tap the concentrations are elevated above the MAC, but does indicate a need for further follow-up.

The licensee, in collaboration with VCH, are working to reduce the concentration of lead in the drinking water. This may require additional testing to determine the source of the lead, and the most appropriate actions. In the meantime, in addition to daily flushing of the taps used for drinking water and food preparation, taps will be flushed for 15 seconds before each use. This action further reduces lead concentration in drinking water. VCH will advise the daycare on appropriate further steps, and will closely monitor implementation.

The detection of lead in a childcare facility's drinking water does not mean that blood testing is required for children and staff. The most important thing to do is identify and remove all suspected sources of lead exposure. The licensee, in consultation with VCH, will share the outcomes of any further testing and if relevant, remediation actions as soon as available.

VCH continues to encourage parents of young children to be aware of and address other potential sources of lead exposure in their home such as plumbing, chipping paint, and hobbies such as designing stained glass, that may involve lead. More information on reducing your exposure to lead can be found here: www.canada.ca/en/health-canada/services/home-garden-safety/reduce-your-exposure-lead.html.

Additional information on this screening initiative is available on the VCH website:

- VCH FAQ for Licensed Childcare Facilities within the VCH region: www.vch.ca/Documents/Lead-testing-of-drinking-water-FAQ.pdf
- VCH Lead in Drinking Water: www.vch.ca/Documents/Lead-in-drinking-water.pdf

Finally, we would like to reassure you that we are taking every measure to remedy this situation. The health and wellbeing of staff and students of the daycare remain a top priority for our team. If you have questions or concerns, please contact your local Senior Child Care Licensing Officer or Senior Environmental Health Officer.

We appreciate your attention to this matter.