

2020 DRINKING WATER QUALITY

ANNUAL REPORT

DISTRICT OF SQUAMISH
December 2021

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Executive Summary

This report details the District of Squamish's drinking water supply and distribution water program for 2020. The District of Squamish is located within the Squamish Nation Traditional Territory. The District of Squamish's Water Supply and Distribution (WS&D) system is governed by the Province of British Columbia's Drinking Water Protection Act and Regulation, Water Sustainability Act and Ground Water Protection Regulation, as well as a Permit to Operate, issued by Vancouver Coastal Health. In 2020, water samples were tested weekly for *E. coli* and total coliform bacteria and semi-annually for numerous physical and chemical parameters to ensure the water quality met the applicable Guidelines for Canadian Drinking Water Quality set out by Health Canada and the potable water quality standards of the BC Drinking Water Protection Act.

The Squamish WS&D system is operated and maintained by the District of Squamish Water Utility Team and is monitored 24 hours/day 365 days/year via the Supervisory Control and Data Acquisition (SCADA) system to ensure optimal and uninterrupted service to the community. The District of Squamish continues active programs relating to water quality, water conservation & loss prevention, water metering, unidirectional and dead-end flushing and cross connection control in effort to reduce the demand on the water supply system and ensure the provision of clean and safe drinking water to the community. In addition to the implementation of several Operational and Capital Improvement/Renewal initiatives to increase system reliability and ensure long-term sustainability.

1.0 Introduction

The purpose of this report is to meet the requirements of the Drinking Water Protection Act and Regulation, the requirements of the District's permit to operate, as well as to increase the understanding of the District's efforts to provide first class potable drinking water to its residents, to raise awareness of the importance conserving water and provide the results of the water quality testing that occurred in 2020. Samples collected from source water and the distribution system are analyzed and referenced to the applicable Guidelines for Canadian Drinking Water Quality set out by Health Canada, and the DWP Act and Regulation.

2.0 General Description

The District of Squamish has the ability to supply water to the community from three sources that include one primary groundwater source, and two surface water sources which are reserved for emergency backup. All water supplies are equipped with either primary or secondary chlorine disinfection. The distribution system consists of seven reservoirs: twenty-two (22) active pressure reducing valve (PRV) stations, four (4) pump stations and 166.3 km of watermain. The system delivers potable water to approximately 23,335 residents, nearly 800 industrial, commercial and institutional (ICI) customers, and the St'á7mes (Stawamus 24), Yekw'ápssem (Yeakwapsem 18), Kewtín (Kowtain 17), Siyí7ch'em (Seaichem 16) and Wíwk'em (Waiwakum 14) First Nations Reserves within the District of Squamish (see Appendix B - District of Squamish Water Distribution Map). In 2020, the District provided 4.23 million cubic meters (m³) of potable water for consumption with an Average Daily Demand (ADD) of 11.6 ML/day and Maximum Daily Demand (MDD) of 17.6 ML/day.

The District employs a Supervisory Control and Data Acquisition (SCADA) system that continuously monitors the WS&D system, records data, and alerts District staff to areas of concern, faults and failures in the system.

3.0 Water Source

The District of Squamish has the ability to obtain its water from three sources:

- Primary Supply: Powerhouse Springs Well Field (Main Water Supply to both South and North distribution)
- Emergency Backup Supply:
 - Stawamus River (South distribution Emergency Backup Water Supply)
 - Mashiter Creek (North distribution Emergency Backup Water supply)

Primary supply infrastructure is comprised of seven (7) groundwater wells at the Powerhouse Springs Well Field. In the event that the Well Field is compromised or unable to meet the distribution system demands (due to a watermain break, pump failure or major fire flow demand or other emergency), water can be drawn from Stawamus River and/or Mashiter Creek. These surface water sources are available as backup only. **In 2020, there was no surface water use in the District of Squamish's water system.**

3.1 Powerhouse Springs Well Site

In 2020, the Powerhouse Springs well site, located near the confluence of Ring Creek and the Mamquam River, operated seven (7) active ground water wells which provide high quality potable water to the District of Squamish. A full description of the system's potential can be found in the District of Squamish – Water Master Plan, located on the District's website. Secondary chlorination is provided to ensure the microbial safety of the water as it travels throughout the distribution network by maintaining a minimum chlorine residual of 0.20mg/L at the end of the distribution network.

3.1.1 Ring Creek Aquifer

The Ring Creek Aquifer is recharged primarily by seepage from Ring Creek and Skookum Creek (69%). Rainfall and snowmelt seepage through the lava flow formation also recharges the aquifer (31%)¹. A Hydrogeological Assessment conducted in 2014 concluded that the water withdrawn by Powerhouse Springs Well Field is at "low risk of containing pathogens". As such, primary disinfection of the water pumped from the Powerhouse Springs aquifer is not necessary.

3.1.2 Powerhouse Springs Wells Rehabilitation

Powerhouse Springs Well No. 3, which was rehabilitated in 2015, was taken offline shortly thereafter due to poor performance post-rehabilitation. As such, a new well was drilled in 2018 to regain lost capacity. Commissioning of the new Well No. 3B was completed in 2020.

Additionally, the District's waterworks department retained a Professional Hydrogeologist and a qualified well maintenance contractor to conduct well rehabilitation works on two of the District's supply wells. In late fall 2020 well No. 7 and well No. 1 were rehabilitated successfully to baseline production capacity. This work also included removal and maintenance of the well no. 1 pump and pitless adapter which is planned to be re-installed in 2021. Additionally, a major electrical upgrade to the automation and control system at Powerhouse Springs was completed in late 2020. This upgrade included the installation of new hardware including a Programmable Logic Controller (PLC) which contains the computer program that allows Powerhouse Springs to run autonomously.

3.1.3 Chlorination of Powerhouse Springs Water

The groundwater that is pumped out of the Powerhouse Springs well field is chlorinated with sodium hypochlorite to achieve secondary disinfection. Utilities staff strive to ensure that a target minimum free residual chlorine concentration of 0.20mg/l at the end of the distribution system is maintained as water travels throughout the distribution network.

In addition to grab sample testing, free chlorine residuals are continuously measured using online chlorine analyzers monitored by SCADA at nine locations throughout the distribution system.

¹ Powerhouse Springs Well Protection Plan, Piteau Associates Engineering Ltd, 2014

3.2 Emergency Surface Water Sources: Stawamus River & Mashiter Creek

In the event of an emergency or water demand in excess of Powerhouse Springs well field capacity, water drawn from the Stawamus River and Mashiter Creek is treated using sodium hypochlorite chlorination as a primary disinfectant. Surface water sources are prone to variable water quality, unlike groundwater taken from an aquifer. For this reason, if back-up sources are activated, the District will immediately consult with VCH to assess water quality conditions and provide advice. It is likely that a Boil Water Advisory would be implemented should water from either of the surface water sources enter the distribution system. As such, a double block and bleed system is in place to ensure water from surface water sources cannot enter the WS&D system without on-site operator intervention. The District holds a water license for the Stawamus River and Mashiter Creek for 132 L/s and 184 L/s, respectively.

3.3 Potential Risks Under Ongoing Consideration

The District of Squamish is fortunate to have multiple sources of freshwater. However the District is constantly monitoring the supply and distribution system for potential risks. Risks may include:

- Aging infrastructure causing water loss
- Aquifer recharge rate may be adversely affected by climate change as glaciers recede and snowpack is lower than usual
- Increasing population causing increased consumption and requiring capital upgrades to maintain adequate fire flow capacity within the distribution system
- Surface water sources are at risk of contamination from human and animal activity in the catchment area
- Increased development rates causing water main and service breaks during ground disturbance and construction activity

Proactive measures and ongoing maintenance programs in place to mitigate potential risks include:

- A Water Master Plan (WMP) and Public Works Asset Management Plan (AMP) are in place and scheduled for periodic updates
 - WMP scheduled for update in 2022
 - AMP update scheduled for update in 2021
- A Monitoring well is installed upstream of the PHS well field to monitor for fluctuations in aquifer capacity
- A Water Conservation Plan and ongoing program is in place
- Community water supply land designations are in place for both emergency surface water sources

4.0 Asset Management, Upgrades, Major Maintenance and Developer Contributions

The District of Squamish maintains and continues to improve its water distribution system to provide the best service possible. The following were some of the key successes from 2020:

- Annual Asset Replacement Program
 - Water main replacement (0.91 km, valued at \$1.19M):
 - Government Road watermain replacement North of the Mamquam River bridge.
 - Thunderbird Ridge watermain replacement
- Plateau Reservoir control valve upgrade
- Chestnut Ave service connection replacement project
- Developer Infrastructure Contributions:
 - Commercial Place watermain installation
 - Aspen Road watermain and fire hydrant
 - University Heights Phase 2 watermain, valves and fire hydrants
 - Eagle Run watermain and fire hydrant
 - Victoria Street and Loggers Lane watermain, valves and fire hydrants
 - Mill Road watermain, valves and fire hydrants
 - Waterfront Landing watermain, line valves and fire hydrants
- Industrial/Commercial/Institutional Metering Program progress: 148 meters installed (\$0.53M).
- Commissioning of Powerhouse Springs Well No. 3B
- A Uni-Directional Flushing program targets to complete all District's water main every 5 years
- The UDF program in 2020 focused on Valleycliffe area and a comprehensive dead-end flushing program

5.0 Standards & Testing Results for Water Supply System

The District of Squamish holds a "Permit to Operate" a water supply system under VCH. The permit includes conditions that must be met in order to maintain this permit in good standing which are outlined in the following subsections. A copy of the permit is included in Appendix A - Permit to Operate.

5.1 Bacteriological Sampling

According to the Permit to Operate, the District of Squamish must collect and analyze a minimum of 20 bacteriological samples per month from the distribution system. Figure 1 shows the number of monthly samples analyzed for bacteriological parameters in 2020. Sample test results are summarized in Appendix C - Water Sample Station Locations, Appendix D - Water Sample Results .

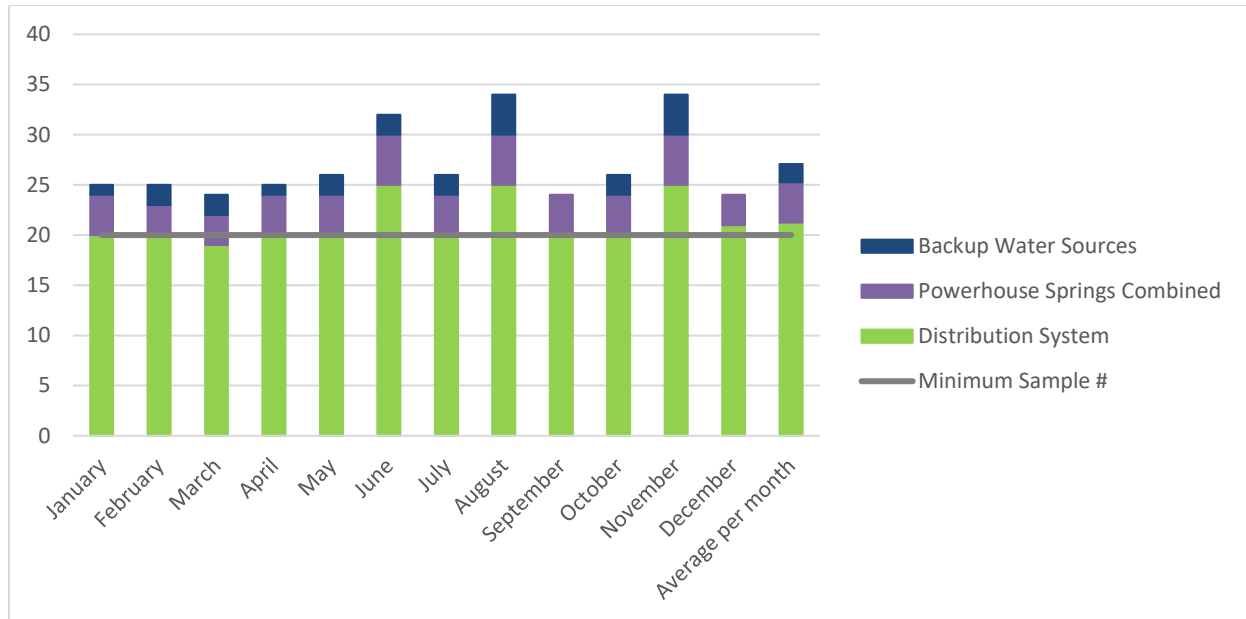


Figure 1. Number of monthly samples analyzed for bacteriological testing for the District of Squamish in 2020.

The average number of water samples from the distribution system tested per month was 21.3.

Water quality standards for potable water² are as follows:

<p style="text-align: center;"><i>Drinking Water Protection Act</i></p> <p style="text-align: center;">DRINKING WATER PROTECTION REGULATION</p> <p style="text-align: center;">[includes amendments up to B.C. Reg. 352/2005, December 9, 2005]</p>	
Parameter:	Standard:
Fecal coliform bacteria	No detectable fecal coliform bacteria per 100 ml
<i>Escherichia coli</i>	No detectable <i>Escherichia coli</i> per 100 ml
Total coliform bacteria	
(a) 1 sample in a 30 day period	No detectable total coliform bacteria per 100 ml
(b) more than 1 sample in a 30 day period	At least 90% of samples have no detectable total coliform bacteria per 100 ml and no sample has more than 10 total coliform bacteria per 100 ml

Summary of the bacteriological testing results for the District of Squamish in 2020 is shown in Table 1.

Table 1. Summary of the bacteriological testing results for the District of Squamish in 2020.

Water Distribution Sample Location	# of Samples	<i>E. coli</i> (EC/100 mL)			Total Coliform (TCU/100 mL)		
		minimum	maximum	average	minimum	maximum	average
Birken	24	<1	<1	<1	<1	<1	<1
Rockridge	25	<1	<1	<1	<1	<1	<1
Perth	24	<1	<1	<1	<1	<1	<1
Progress Way	25	<1	<1	<1	<1	<1	<1
Guildford	25	<1	<1	<1	<1	<1	<1
Quest University	26	<1	<1	<1	<1	<1	<1
Lomond	26	<1	<1	<1	<1	<1	<1
Parkway	27	<1	<1	<1	<1	2	<1
Pemberton	27	<1	<1	<1	<1	<1	<1
Crumpit Woods	26	<1	<1	<1	<1	<1	<1
Powerhouse Springs (Pre-chlorination)	48	<1	<1	<1	<1	<1	<1
Total Samples:	303						

99.7% of the total samples tested negative or <1 per/100 mL for Total Coliform and all samples tested negative or <1 per/100 mL for *E.coli* in the distribution system over the monitoring period in 2020.

² http://www.bclaws.ca/civix/document/id/loo72/loo72/200_2003#section2

5.2 Physical and Chemical Parameters

Water is tested for a wide range of physical and chemical parameters carried out by an independent lab to ensure that potable water distributed within the District of Squamish meets the Guidelines for Canadian Drinking Water Quality (GCDWQ). Water samples are tested semi-annually for physical and chemical parameters at Powerhouse Springs (the District's primary water source), and annually at Stawamus River and Mashiter Creek (emergency backup water sources). The results of the independent lab's reports for summer and fall 2020 are included in Appendix C - Water Sample Station Locations, Appendix D - Water Sample Results.

Analysis results from all samples taken from Powerhouse Springs, the primary water source, fell within the Maximum Allowable Concentration (MAC) or Aesthetic Objective (AO) for all physical and chemical parameters tested in 2020.

Samples are collected and analyzed for disinfection by-products at four (4) other sample locations. Disinfection by-products (DPB's) are chemical compounds that form when chlorine compounds react with organic matter dissolved in water. All samples analyzed contained levels of disinfection by-products below the GCDWQ's MAC.

5.2.1 Corrosivity Factor in Water

In 2016, VCH published a flushing guideline to reduce potential lead exposure in drinking water. The most recent version of the flushing guideline can be found in Appendix E - VCH Advice re Lead in Drinking Water. As stated in VCH's flushing guideline, lead may enter private drinking water systems from building plumbing when water sits in pipes for long periods of time, such as overnight or over weekends. This is particularly true for soft (low hardness) and slightly acidic (low pH and alkalinity) water typically found in many water systems in the South Coast of BC.

The current guideline for lead in drinking water is a maximum acceptable concentration (MAC) of 0.005 mg/L. Even though the District's water source contains no detectable lead, the water is soft (low in hardness), low in alkalinity, and exhibits a neutral to slightly basic pH (pH>7). These characteristics mean that the District's water tends to dissolve some materials that it may come into contact with. For example, if water sits unused in building piping for extended periods, it can draw out metals, including lead, from metal fixtures and pipes in homes. The District encourages its residents to follow VCH's flushing guideline to reduce potential lead exposure.

6.0 Conditions of Permit to Operate a Water Supply System

6.1 Cross-Connection Control Program

The District of Squamish continues to operate its Cross Connection Control (CCC) Program in order to protect the safety of the drinking water system. Contamination of the potable water system can happen from backflow through cross connections with private plumbing systems. A cross connection is a physical connection between a potable water supply system and a source of contamination. A backflow or back-

syphon event is the undesired reverse flow of water creating the potential for contaminants to be drawn back into the potable water supply system if a negative pressure event, such as a water main break, occurs in the system.

The District of Squamish is working to ensure the proper installation of backflow prevention assemblies to mitigate the hazards of cross connections. A backflow prevention assembly is a series of “one-way” valves that only allows water to flow in the desired direction and physically impedes reverse flow.

6.2 Well Protection Plan

Implementation of a Well Protection Plan is a condition of the District’s Permit to Operate. The Powerhouse Springs Well Protection Plan was developed in 2014 for the seven wells operating at Powerhouse Springs well field at the time. The Well Protection Plan can be found on the District’s website. This plan follows the Province’s “Well Protection Toolkit” which includes defining the well protection area, identifying potential contaminants, developing management strategies and contingency plans, and finally, implementing a monitoring and evaluating the plan.

In accordance with the recommendations of the plan, the District of Squamish installed signage at the Powerhouse Springs well field to inform road and trail users that they are travelling through the groundwater protection zone.

6.3 Dead-End and Unidirectional Flushing Program

The utilities waterworks crew conducts an annual watermain flushing program to scour water mains. The purpose of this program is to maintain distribution system capacity and remove aged water. The District conducted unidirectional flushing on 20% of the town’s water mains annually and flushes 100% of the dead-end lines each year to ensure water quality. The Valleycliffe area was flushed in 2020, as well as all of the dead ends and low flow areas of the system.

6.4 Online Monitoring

District staff continuously monitor the operation of the water supply system using SCADA to monitor the water network in real-time. Collected data ranges from the well field pump output, chlorine concentrations in the distribution system, to rainfall accumulation data. Alarms are generated if control point values go below minimum or above maximum thresholds or if equipment fault codes are registered. The SCADA system allows for operational optimization by automatically controlling variables such as reservoir levels and pump outputs to ensure that water is available to meet demand and, in some cases, allows for remote operator intervention if necessary.

Surface water sources are monitored for turbidity at both the Stawamus River and Mashiter Creek using online turbidity analyzers. If a backup surface water source were to be used, the chlorine levels would be measured by on-line analyzers and communicated via the SCADA system after chlorine is added to the water entering the distribution system.

6.5 Long-Term Water Supply Strategy

The District of Squamish – Water Master Plan was completed in July 2015. The Water Master Plan can be found on the District’s website. This report analyzed the District’s existing water system, estimated future demands to the year 2031 and provided recommendations for long-term strategies. Recommendations identified in the Water Master Plan include a long-term source development strategy, a water meter implementation strategy, a water conservation plan, a watermain renewal program, and recommendations for Developer Cost Charge (DCC) projects.

Under current growth projections, the current water source capacity at the Powerhouse Springs Well field will be able to service the District beyond 2031. When demand approaches the current water source capacity, the District has a number of options to provide additional water supply. A replacement well, No. 3B, was drilled in 2018 and brought online in early 2020 to replace well #3. It provides additional capacity and increases the total combined well field pumping rate available from Powerhouse Springs.

Although the Stawamus River and Mashiter Creek used to be the primary supply of potable water to the District prior to the development of the Powerhouse Springs well field, they are now only maintained for back-up and emergency purposes. Resuming their use as a primary source would require expensive capital upgrades to provide surface water treatment that meets current regulations and the associated ongoing maintenance costs.

A revision of the Districts Water Master Plan is scheduled for 2022.

6.5.1 Water System Renewals and Upgrades

Upgrades and replacements to the water distribution system were completed in 2020 in Garibaldi Estates, Garibaldi Highlands, and Valleycliff. System maintenance and upgrades will continue in future years as per the District’s Asset Management Plan and Water Master Plan recommendations. A revision to the Districts Asset Management Plan is currently underway.

6.5.2 Water Conservation

An important factor considering the rate of growth of the community and aging infrastructure is the need to reduce per capita water consumption to assist in maintaining adequate water supply while reducing the substantial costs associated with building the required infrastructure to increase capacity. Outdoor water use is the primary target for water use reduction. In 2020 the total combined³ average day demand per capita was 495 L/c/d. Since 2014, the Average Day Demand (ADD) has decreased an average of 1.6 L/c/d per year, which is on track with the District's Water Conservation Plan reduction target of 1.0 L/c/d each year.

³ Total water consumption including industrial, commercial, institutional, and residential users.

6.5.3 Water Metering

In 2020 the District of Squamish continued its ongoing grant assisted program to install water meters for historically unmetered ICI customers. All new ICI and multi-family buildings are required to have a water meter included in their construction. Existing buildings are having meters installed as part of a multi-year capital project that will progress as funds become available. In 2020, 148 new meters were installed bringing the total number of ICI and multi-family residential meters to 387 at year end.

6.6 Emergency Response and Contingency Plan

As per the requirements set out by the VCH's Permit to Operate, the District of Squamish reviews and submits updates to the Water System – Emergency Response and Contingency Plan (ERCP) annually. This document provides guidelines for action that will be taken by District staff in the event of an emergency.

The document outlines that in the event there is a threat to the quality of drinking water, VCH's Drinking Water Officer (DWO) will be informed. During an emergency, the DWO and other health authority staff will provide advice about public notification and monitoring of water quality, however the District of Squamish Communications Department will take the lead role as spokesperson for media inquiries and releases.

7.0 Significant Events & Public Notification

The COVID-19 pandemic had a significant impact on the District's operation of the water supply and distribution system. Numerous procedural adjustments were made and continue to be in place to keep operators and support staff safe. Modifications to District's operating procedures included but were not limited to:

- Required daily health screening for all staff
- Mandated face coverings for staff when working indoors, in vehicles and when physical distancing of at least 6ft (1.83m) cannot be maintained while working outdoors
- Migrated meetings to online meeting platforms
- Staggered start and break times for staff to reduce staff contact
- Created operational 'bubbles' to reduce contact between various departments in the Public Works division
- Temporarily moved to 4 x 10-hour from 5 x 8-hour schedule to reduce staff contact

7.1 Drinking Water Advisory/Boil Water Advisory

No Drinking Water Advisories or Boil Water Advisories were issued in 2020.

8.0 Operator Qualifications and Training

According to the Drinking Water Protection Regulation, under the Drinking Water Protection Act, staff working on the water system must have a minimum level of certification with the Environmental Operators Certification Program (EOCP). This ensures that District staff are adequately trained to operate, maintain and repair water supply and distribution system in order to protect the safety and quality of drinking water that is delivered to the end user.

The District of Squamish Water Distribution System is classified by the EOCP as a Class 3 facility (WD-III). The District of Squamish provides regular training opportunities to ensure staff maintain their certifications and supports its staff in achieving further education and training in their respective fields in order to provide the best service to its residents. Environmental Operators Certifications for Water Distribution and Water Treatment held for the District of Squamish in 2020 are shown in Table 2.

Table 2. Total number of District of Squamish Utility staff that hold Water Distribution certificates for each level of training in the Environmental Operators Certification Program.

Level of Certification	Water Distribution
Operator in Training	1
Level 1	2
Level 2	2
Level 3	1
Total	5

9.0 Closing

The District of Squamish delivers a very high quality of drinking water to its residents and end users. Citizens of Squamish are fortunate to have access to groundwater from the Ring Creek Aquifer as the primary source for drinking water.

In 2020 the District of Squamish met all of the conditions set out by VCH in the Districts' Permit to Operate a Water Supply System. In 2020 bacteriological sampling was completed weekly and met the potable water quality standards set out by the BC Drinking Water Protection Act and Regulation. Physical and chemical tests were carried out semi-annually. The results of that sampling program align with the Guidelines for Canadian Drinking Water Quality. The cross-connection control program, well protection plan and flushing programs were all carried out as outlined in the conditions of the District's Permit to Operate. The SCADA system continues to monitor the water distribution system in real-time and the District of Squamish has a long-term water supply strategy and an up-to-date Emergency Response and Contingency Plan to guide its response during emergency events.

The District continues to work to maintain, replace and upgrade the existing infrastructure, and to integrate operations and maintenance of new infrastructure, while aiming to reduce the overall demand on the system through the Water Conservation Program. Overall, the District of Squamish is proud of the water it delivers to its customers and residents and will continue to strive for the highest quality standards possible.

Appendix A - Permit to Operate



HEALTH PROTECTION

PERMIT TO OPERATE

A Water Supply System

Purveyor: District Of Squamish
Facility Name: District Of Squamish Waterworks

Conditions of Permit

Minimum bacteriological sampling frequency is 20 / month (distribution).
Test for physical and chemical parameters in accordance with your monitoring plan.
Operate in accordance with your Cross-Connection Control Program.
Implement your Well Protection Plan.
Maintain your Unidirectional Flushing Program annually
Maintain continuous on-line monitoring of the water disinfection process.
Maintain continuous on-line turbidity sampling for each surface water source.
Review and update the Emergency Response and Contingency Plan annually.

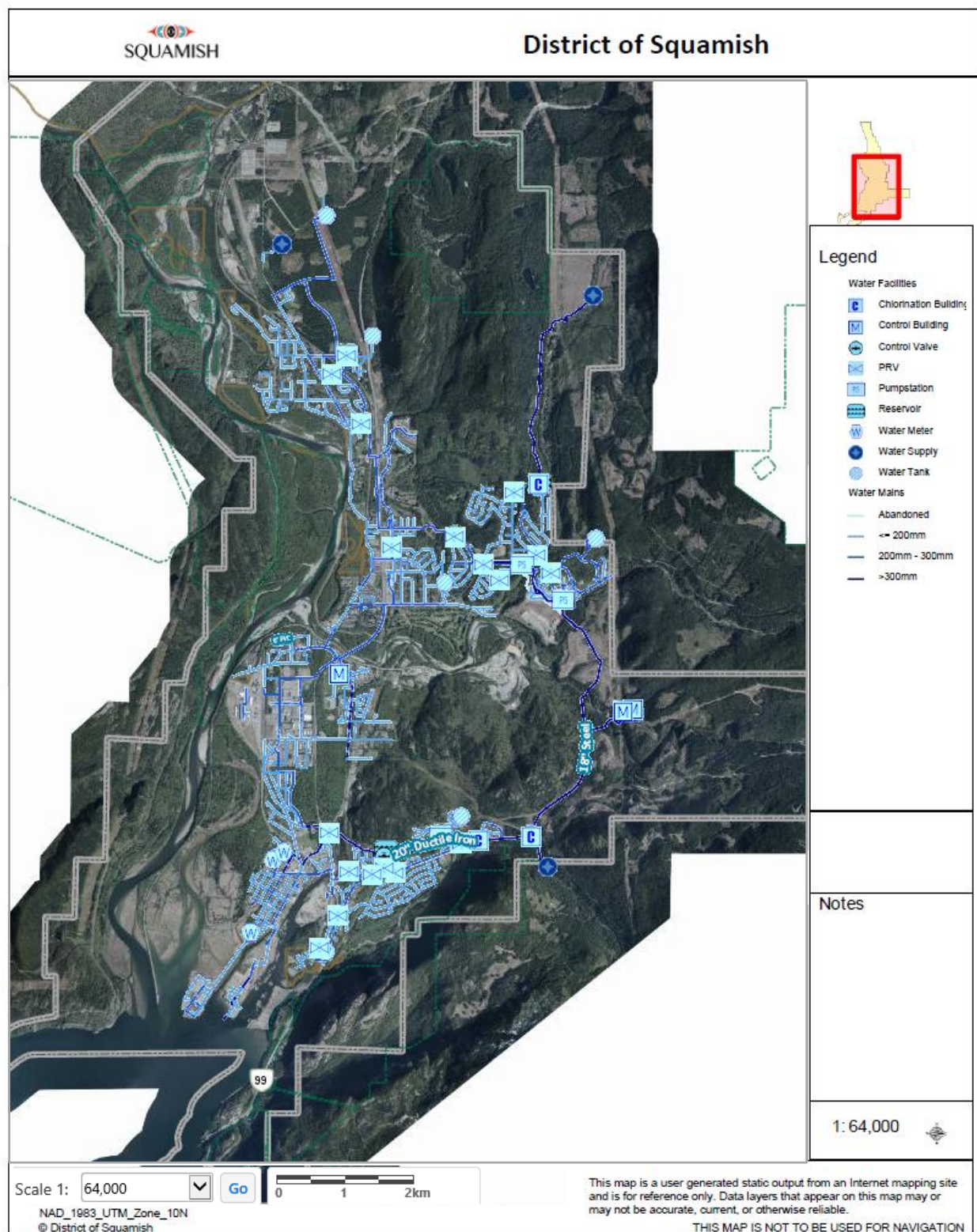
May 21, 1997
Effective Date
June 29, 2021
Revised Date



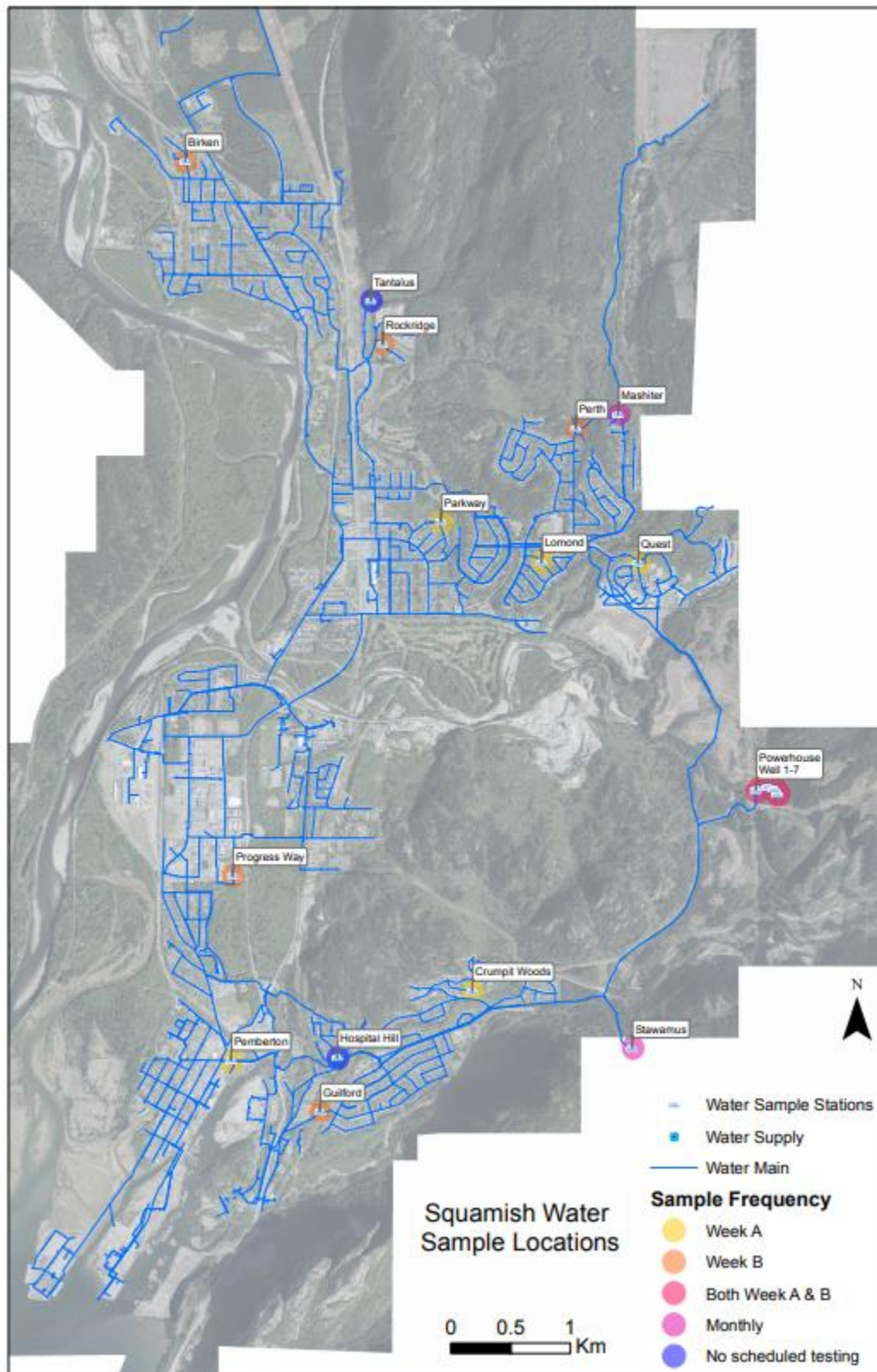
Drinking Water Officer

This permit must be displayed in a conspicuous place and is not transferable

Appendix B - District of Squamish Water Distribution Map



Appendix C - Water Sample Station Locations



Appendix D - Water Sample Results

1. Weekly Water Sample Results (bacteriological)
2. Semi-Annual Drinking Water Sampling Report June 2020
3. Semi-Annual Drinking Water Sampling Report November 2020

Sample Range Report

Vancouver Coastal Health

Facility Name: District Of Squamish Waterworks

Date Range: Jan 1 2020 to Dec 31 2020

Operator Bob Smith
Box 310
Squamish, BC V8B 0A3

Sampling Site	Date Collected	Total Coliform	E. Coli	Fecal Coliform
<u>Rockridge sample station, across from 41215-Rockridge Pl.</u>				
	1/13/2020	L1	L1	
	1/27/2020 9:25:00 AM	LT1	LT1	
	2/10/2020 9:21:00 AM	LT1	LT1	
	2/24/2020 10:10:00 AM	LT1	LT1	
	3/9/2020 8:59:00 AM	LT1	LT1	
	3/16/2020 9:50:00 AM	LT1	LT1	
	3/23/2020 9:15:00 AM	LT1	LT1	
	4/6/2020 10:20:00 AM	LT1	LT1	
	4/20/2020 8:30:00 AM	LT1	LT1	
	5/4/2020 10:30:00 AM	LT1	LT1	
	5/19/2020 10:25:00 AM	LT1	LT1	
	6/1/2020 8:55:00 AM	LT1	LT1	
	6/15/2020 10:30:00 AM	LT1	LT1	
	6/29/2020 9:50:00 AM	LT1	LT1	
	7/13/2020 9:40:00 AM	LT1	LT1	
	7/27/2020 7:35:00 AM	LT1	LT1	
	8/10/2020 11:25:00 AM	LT1	LT1	
	8/24/2020 8:10:00 AM	LT1	LT1	
	9/8/2020 10:30:00 AM	LT1	LT1	
	9/21/2020 10:42:00 AM	LT1	LT1	
	10/5/2020 11:40:00	LT1	LT1	

AM		
10/19/2020 10:48:00	LT1	LT1
AM		
11/2/2020 10:40:00	LT1	LT1
AM		
11/16/2020 11:20:00	LT1	LT1
AM		
11/30/2020 7:30:00	LT1	LT1
AM		
12/14/2020 8:50:00	LT1	LT1
AM		
12/15/2020 11:20:00	<u>LT1</u>	<u>LT1</u>
AM		
Total Positive:	0	0

Crumpet Woods
sample station, 2252
Windsail PI

1/6/2020	L1	L1
1/20/2020	L1	L1
2/3/2020 11:15:00	LT1	LT1
AM		
2/17/2020 10:10:00	REJCT DELAY3	REJCT DELAY3
AM		
2/24/2020 11:55:00	LT1	LT1
AM		
3/2/2020 10:25:00	LT1	LT1
AM		
3/30/2020 9:40:00	LT1	LT1
AM		
4/14/2020 9:30:00	LT1	LT1
AM		
4/27/2020 9:10:00	LT1	LT1
AM		
5/11/2020 9:45:00	LT1	LT1
AM		
5/25/2020 8:40:00	LT1	LT1
AM		
6/8/2020 8:10:00 AM	LT1	LT1
6/22/2020 8:15:00	LT1	LT1
AM		
7/6/2020 9:10:00 AM	LT1	LT1
7/20/2020 9:32:00	LT1	LT1
AM		
8/4/2020 11:25:00	LT1	LT1
AM		
8/17/2020 8:55:00	LT1	LT1
AM		
8/31/2020 6:55:00	LT1	LT1
AM		
9/14/2020 10:25:00	LT1	LT1
AM		
9/28/2020 9:50:00	LT1	LT1
AM		

10/13/2020 9:30:00 AM	LT1	LT1
10/26/2020 11:25:00 AM	LT1	LT1
11/9/2020 9:25:00 AM	LT1	LT1
11/23/2020 10:00:00 AM	LT1	LT1
12/7/2020 8:55:00 AM	LT1	LT1
12/15/2020 10:45:00 AM	<u>LT1</u>	<u>LT1</u>
Total Positive:	0	0

41974 Birken Rd.
Brackendale

1/13/2020	L1	L1
1/27/2020 8:55:00 AM	LT1	LT1
2/10/2020 9:00:00 AM	LT1	LT1
2/24/2020 9:45:00 AM	LT1	LT1
3/9/2020 8:41:00 AM	LT1	LT1
3/16/2020 9:30:00 AM	LT1	LT1
3/23/2020 8:45:00 AM	LT1	LT1
4/6/2020 10:40:00 AM	LT1	LT1
4/20/2020 8:45:00 AM	LT1	LT1
5/4/2020 11:10:00 AM	LT1	LT1
5/19/2020 9:30:00 AM	LT1	LT1
6/1/2020 10:00:00 AM	LT1	LT1
6/15/2020 10:10:00 AM	LT1	LT1
6/29/2020 9:30:00 AM	LT1	LT1
7/13/2020 9:15:00 AM	LT1	LT1
7/27/2020 7:05:00 AM	LT1	LT1
8/10/2020 11:08:00 AM	LT1	LT1
8/24/2020 7:30:00 AM	LT1	LT1
9/8/2020 9:50:00 AM	LT1	LT1
9/21/2020 10:20:00 AM	LT1	LT1
10/5/2020 11:52:00	LT1	LT1

AM		
10/19/2020 9:56:00	LT1	LT1
AM		
11/2/2020 10:50:00	LT1	LT1
AM		
11/16/2020 10:20:00	LT1	LT1
AM		
11/30/2020 6:55:00	LT1	LT1
AM		
12/14/2020 7:55:00	<u>LT1</u>	<u>LT1</u>
AM		
Total Positive:	0	0

Parkway Sample
station, 40464 Park
Crescent

1/6/2020	L1	L1
1/20/2020	L1	L1
2/3/2020 10:20:00	LT1	LT1
AM		
2/17/2020 11:00:00	REJCT DELAY3	REJCT DELAY3
AM		
3/2/2020 9:31:00 AM	LT1	LT1
3/16/2020 10:20:00	LT1	LT1
AM		
3/30/2020 10:30:00	LT1	LT1
AM		
4/14/2020 10:50:00	LT1	LT1
AM		
4/27/2020 11:20:00	LT1	LT1
AM		
5/11/2020 10:46:00	LT1	LT1
AM		
5/25/2020 9:25:00	LT1	LT1
AM		
6/8/2020 10:55:00	LT1	LT1
AM		
6/22/2020 9:35:00	LT1	LT1
AM		
7/6/2020 11:42:00	LT1	LT1
AM		
7/20/2020 8:33:00	LT1	LT1
AM		
8/4/2020 10:55:00	LT1	LT1
AM		
8/17/2020 10:20:00	LT1	LT1
AM		
8/31/2020 9:20:00	LT1	LT1
AM		
9/14/2020 10:50:00	LT1	LT1
AM		
9/28/2020 11:15:00	LT1	LT1
AM		
10/13/2020 10:40:00	LT1	LT1

AM		
10/26/2020 10:55:00	LT1	LT1
AM		
11/9/2020 9:45:00	LT1	LT1
AM		
11/23/2020 11:15:00	LT1	LT1
AM		
12/7/2020 10:25:00	LT1	LT1
AM		
12/15/2020 11:00:00	<u>LT1</u>	<u>LT1</u>
AM		
Total Positive:	0	0

Perth Sample
Station, Garibaldi
Highlands

1/13/2020	L1	L1
1/27/2020 10:28:00	LT1	LT1
AM		
2/10/2020 9:37:00	LT1	LT1
AM		
2/24/2020 10:48:00	LT1	LT1
AM		
3/9/2020 9:48:00 AM	LT1	LT1
3/16/2020 11:00:00	LT1	LT1
AM		
3/23/2020 9:30:00	LT1	LT1
AM		
4/6/2020 10:05:00	LT1	LT1
AM		
4/20/2020 9:20:00	LT1	LT1
AM		
5/4/2020 10:35:00	LT1	LT1
AM		
5/19/2020 10:45:00	LT1	LT1
AM		
6/1/2020 8:35:00 AM	LT1	LT1
6/15/2020 10:55:00	LT1	LT1
AM		
6/29/2020 10:10:00	LT1	LT1
AM		
7/13/2020 10:20:00	LT1	LT1
AM		
7/27/2020 8:05:00	LT1	LT1
AM		
8/10/2020 11:40:00	LT1	LT1
AM		
8/24/2020 8:45:00	LT1	LT1
AM		
9/8/2020 11:03:00	LT1	LT1
AM		
9/21/2020 11:40:00	LT1	LT1
AM		
10/5/2020 11:21:00	LT1	LT1

AM		
10/19/2020 10:25:00	LT1	LT1
AM		
11/2/2020 10:25:00	LT1	LT1
AM		
11/16/2020 11:20:00	LT1	LT1
AM		
11/30/2020 8:00:00	LT1	LT1
AM		
12/14/2020 9:20:00	<u>LT1</u>	<u>LT1</u>
AM		
Total Positive:	0	0

Micellaneous Site.
Squamish

4/27/2020 10:10:00	<u>LT1</u>	<u>LT1</u>
AM		
Total Positive:	0	0

Guilford sample
station, East of
Guilford & Valley Dr.

1/13/2020	L1	L1
1/27/2020 12:10:00	LT1	LT1
PM		
2/10/2020 10:40:00	LT1	LT1
AM		
2/24/2020 11:40:00	LT1	LT1
AM		
3/9/2020 10:25:00	LT1	LT1
AM		
3/23/2020 10:15:00	LT1	LT1
AM		
4/6/2020 9:25:00 AM	LT1	LT1
4/20/2020 9:55:00	LT1	LT1
AM		
5/4/2020 5:46:00 PM	LT1	LT1
5/19/2020 8:55:00	LT1	LT1
AM		
6/1/2020 11:30:00	LT1	LT1
AM		
6/15/2020 9:00:00	LT1	LT1
AM		
6/29/2020 7:45:00	LT1	LT1
AM		
7/13/2020 8:50:00	LT1	LT1
AM		
7/27/2020 9:20:00	LT1	LT1
AM		
8/10/2020 10:40:00	LT1	LT1
AM		
8/24/2020 10:05:00	LT1	LT1
AM		

9/8/2020 9:10:00 AM	LT1	LT1
9/21/2020 9:10:00 AM	LT1	LT1
10/5/2020 9:45:00 AM	LT1	LT1
10/19/2020 9:18:00 AM	LT1	LT1
11/2/2020 11:15:00 AM	LT1	LT1
11/16/2020 9:10:00 AM	LT1	LT1
11/30/2020 10:00:00 AM	LT1	LT1
12/14/2020 10:00:00 AM	LT1	LT1
12/15/2020 10:05:00 AM	<u>LT1</u>	<u>LT1</u>
Total Positive:	0	0

Progress Way
sample station.
38917 Progress Way

1/13/2020	L1	L1
1/27/2020 10:30:00 AM	LT1	LT1
2/10/2020 10:25:00 AM	LT1	LT1
2/24/2020 9:10:00 AM	LT1	LT1
3/9/2020 10:10:00 AM	LT1	LT1
3/16/2020 11:40:00 AM	LT1	LT1
3/23/2020 10:00:00 AM	LT1	LT1
4/6/2020 11:25:00 AM	LT1	LT1
4/20/2020 10:15:00 AM	LT1	LT1
5/4/2020 11:25:00 AM	LT1	LT1
5/19/2020 11:00:00 AM	LT1	LT1
6/1/2020 10:20:00 AM	LT1	LT1
6/15/2020 11:15:00 AM	LT1	LT1
6/29/2020 11:00:00 AM	LT1	LT1
7/13/2020 10:30:00 AM	LT1	LT1
7/27/2020 8:50:00 AM	LT1	LT1
8/10/2020 11:56:00	LT1	LT1

AM		
8/24/2020 9:30:00	LT1	LT1
AM		
9/8/2020 11:50:00	LT1	LT1
AM		
9/21/2020 9:55:00	LT1	LT1
AM		
10/5/2020 12:10:00	LT1	LT1
PM		
10/19/2020 11:25:00	LT1	LT1
AM		
11/2/2020 11:35:00	LT1	LT1
AM		
11/16/2020 11:43:00	LT1	LT1
AM		
11/30/2020 9:45:00	LT1	LT1
AM		
12/14/2020 9:35:00	LT1	LT1
AM		
12/15/2020 9:40:00	<u>LT1</u>	<u>LT1</u>
AM		
Total Positive:	0	0

Quest University,
University Lands

1/6/2020	L1	L1
1/20/2020	L1	L1
2/3/2020 9:15:00 AM	LT1	LT1
2/17/2020 10:35:00	REJCT DELAY3	REJCT DELAY3
AM		
2/24/2020 10:30:00	LT1	LT1
AM		
3/2/2020 8:55:00 AM	LT1	LT1
3/16/2020 10:50:00	LT1	LT1
AM		
3/30/2020 10:07:00	LT1	LT1
AM		
4/14/2020 10:40:00	LT1	LT1
AM		
4/27/2020 10:30:00	LT1	LT1
AM		
5/11/2020 10:30:00	LT1	LT1
AM		
5/25/2020 10:45:00	LT1	LT1
AM		
6/8/2020 10:25:00	LT1	LT1
AM		
6/22/2020 9:55:00	LT1	LT1
AM		
7/6/2020 11:20:00	LT1	LT1
AM		
7/20/2020 8:10:00	LT1	LT1
AM		
8/4/2020 10:20:00	LT1	LT1

AM		
8/17/2020 10:00:00	LT1	LT1
AM		
8/31/2020 9:50:00	LT1	LT1
AM		
9/14/2020 11:15:00	LT1	LT1
AM		
9/28/2020 10:30:00	LT1	LT1
AM		
10/13/2020 10:05:00	LT1	LT1
AM		
10/26/2020 10:30:00	LT1	LT1
AM		
11/9/2020 10:15:00	LT1	LT1
AM		
11/23/2020 10:40:00	LT1	LT1
AM		
12/7/2020 9:55:00	<u>LT1</u>	<u>LT1</u>
AM		
Total Positive:	0	0

Lomond Sample
Station, Garibaldi
Highlands

1/6/2020	L1	L1
1/20/2020	L1	L1
2/3/2020 10:00:00	LT1	LT1
AM		
2/17/2020 10:45:00	REJCT DELAY3	REJCT DELAY3
AM		
2/24/2020 10:35:00	LT1	LT1
AM		
3/2/2020 8:42:00 AM	LT1	LT1
3/16/2020 11:20:00	LT1	LT1
AM		
3/30/2020 10:25:00	LT1	LT1
AM		
4/14/2020 10:20:00	LT1	LT1
AM		
4/27/2020 11:05:00	LT1	LT1
AM		
5/11/2020 10:15:00	LT1	LT1
AM		
5/25/2020 10:55:00	LT1	LT1
AM		
6/8/2020 10:35:00	LT1	LT1
AM		
6/22/2020 10:10:00	LT1	LT1
AM		
7/6/2020 11:30:00	LT1	LT1
AM		
7/20/2020 7:33:00	LT1	LT1
AM		
8/4/2020 10:40:00	LT1	LT1

AM		
8/17/2020 10:10:00	LT1	LT1
AM		
8/31/2020 10:20:00	LT1	LT1
AM		
9/14/2020 11:30:00	LT1	LT1
AM		
9/28/2020 10:45:00	LT1	LT1
AM		
10/13/2020 10:20:00	LT1	LT1
AM		
10/26/2020 10:40:00	LT1	LT1
AM		
11/9/2020 10:25:00	LT1	LT1
AM		
11/23/2020 10:50:00	LT1	LT1
AM		
12/7/2020 10:10:00	<u>LT1</u>	<u>LT1</u>
AM		
Total Positive:	0	0

Pemberton sample
station, across from
1551 Pemberton Ave

1/6/2020	L1	L1
1/20/2020	L1	L1
2/3/2020 10:50:00	LT1	LT1
AM		
2/17/2020 11:45:00	REJCT DELAY3	REJCT DELAY3
AM		
2/24/2020 12:15:00	LT1	LT1
PM		
3/2/2020 9:56:00 AM	LT1	LT1
3/16/2020 11:50:00	LT1	LT1
AM		
3/30/2020 11:15:00	LT1	LT1
AM		
4/14/2020 11:10:00	LT1	LT1
AM		
4/27/2020 9:35:00	LT1	LT1
AM		
5/11/2020 11:05:00	LT1	LT1
AM		
5/25/2020 11:13:00	LT1	LT1
AM		
6/8/2020 11:15:00	LT1	LT1
AM		
6/22/2020 11:05:00	LT1	LT1
AM		
7/6/2020 12:30:00	LT1	LT1
PM		
7/20/2020 9:05:00	LT1	LT1
AM		
8/4/2020 11:40:00	LT1	LT1

AM		
8/17/2020 11:00:00	LT1	LT1
AM		
8/31/2020 8:40:00	LT1	LT1
AM		
9/14/2020 11:52:00	LT1	LT1
AM		
9/28/2020 11:50:00	LT1	LT1
AM		
10/13/2020 11:15:00	LT1	LT1
AM		
10/26/2020 11:45:00	LT1	LT1
AM		
11/9/2020 10:55:00	LT1	LT1
AM		
11/23/2020 11:40:00	LT1	LT1
AM		
12/7/2020 9:20:00	LT1	LT1
AM		
12/15/2020 11:35:00	<u>LT1</u>	<u>LT1</u>
AM		
Total Positive:	0	0

Result Values:

E - estimated

L - less than

G - greater than

Samples that contain total coliform:	0	0.00% of total
Samples that contain e. coli:	0	0.00% of total
Samples that contain fecal coliform:	0	0.00% of total
Number of consecutive samples that contain total coliform:	0	
Number of samples that contain total coliform in last 30 days:	0/0	
Total number of samples:	264	

Comments:

Environmental Health Officer

Dec 7 2021

FOR FURTHER INFORMATION PLEASE CALL: Dan Glover (604) 892-2293

Semi-Annual Drinking Water Sampling Report June 2020

CERTIFICATE OF ANALYSIS

Work Order : **VA20A7525**
Client : **District of Squamish**
Contact : Craig Halliday
Address : 39907 Government Road PO Box 310
 Squamish BC Canada V8B 0A3
Telephone : 604 815 6864
Project : June Samples
PO : 118389
C-O-C number : 17-841673
Sampler : Calem
Site : ----
Quote number : ----
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 5
Laboratory : Vancouver - Environmental
Account Manager : Carla Fuginski
Address : 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 02-Jun-2020 13:50
Date Analysis Commenced : 03-Jun-2020
Issue Date : 11-Jun-2020 13:15

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Caitlin Macey	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Kevin Duarte	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Kinny Wu	Laboratory Analyst	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics - Water Quality, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Sandra Cummings	Interim Department Manager - LCMS	LCMS, Waterloo, Ontario
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics - Water Quality, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	Description
µS/cm	Microsiemens per centimetre
CU	colour units
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.



Analytical Results

Sub-Matrix: Water
 (Matrix: Water)

Client sample ID

					Powerhouse Springs	----	----	----	----
Client sampling date / time					02-Jun-2020 08:55	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20A7525-001	-----	-----	-----	-----
					Result	----	----	----	----
Physical Tests									
alkalinity, total (as CaCO ₃)	----	E290	1.0	mg/L	19.8	----	----	----	----
colour, true	----	E329	5.0	CU	<5.0	----	----	----	----
conductivity	----	E100	2.0	µS/cm	74.8	----	----	----	----
hardness (as CaCO ₃), from total Ca/Mg	----	EC100A	0.60	mg/L	21.9	----	----	----	----
pH	----	E108	0.10	pH units	7.34	----	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L	60	----	----	----	----
turbidity	----	E121	0.10	NTU	<0.10	----	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	----	----	----	----
bromate	15541-45-4	E722A	0.00030	mg/L	<0.00030	----	----	----	----
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	4.38	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.087	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0569	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0391	----	----	----	----
sulfate (as SO ₄)	14808-79-8	E235.SO4	0.30	mg/L	8.00	----	----	----	----
Cyanides									
cyanide, total	----	E333	0.0050	mg/L	<0.0050	----	----	----	----
Organic / Inorganic Carbon									
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	----	----	----	----
Inorganic Parameters									
chlorate	14866-68-3	E409.CLO3	0.050	mg/L	<0.050	----	----	----	----
chlorite	14998-27-7	E409.CLO2	0.050	mg/L	<0.050	----	----	----	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	----	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	----	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00066	----	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L	0.00144	----	----	----	----
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	----	----	----	----



Analytical Results

Sub-Matrix: Water					Client sample ID	Powerhouse Springs	----	----	----	----
(Matrix: Water)										
Client sampling date / time					02-Jun-2020 08:55	----	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20A7525-001	-----	-----	-----	-----	-----
					Result	----	----	----	----	----
Total Metals										
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	----	----	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L	0.019	----	----	----	----	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	----	----	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L	6.65	----	----	----	----	----
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000180	----	----	----	----	----
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	<0.00010	----	----	----	----	----
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L	0.0252	----	----	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	----	----	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L	0.000134	----	----	----	----	----
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0025	----	----	----	----	----
magnesium, total	7439-95-4	E420	0.0050	mg/L	1.29	----	----	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	----	----	----	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000551	----	----	----	----	----
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	----	----	----	----	----
phosphorus, total	7723-14-0	E420	0.050	mg/L	0.063	----	----	----	----	----
potassium, total	7440-09-7	E420	0.050	mg/L	1.29	----	----	----	----	----
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00370	----	----	----	----	----
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	----	----	----	----	----
silicon, total	7440-21-3	E420	0.10	mg/L	14.0	----	----	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	----	----	----	----	----
sodium, total	7440-23-5	E420	0.050	mg/L	5.05	----	----	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L	0.0760	----	----	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	2.16	----	----	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	----	----	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	----	----	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	----	----	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	----	----	----	----	----



Analytical Results

Sub-Matrix: Water					Client sample ID	Powerhouse Springs	----	----	----	----
(Matrix: Water)										
					Client sampling date / time	02-Jun-2020 08:55	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20A7525-001	-----	-----	-----	-----	-----
					Result	---	---	---	---	---
Total Metals										
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000033	----	----	----	----	----
vanadium, total	7440-62-2	E420	0.000050	mg/L	0.0105	----	----	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0041	----	----	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	----	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.



Environmental

CERTIFICATE OF ANALYSIS

Work Order : **VA20A7491**
Client : **District of Squamish**
Contact : Craig Halliday
Address : 39907 Government Road PO Box 310
Squamish BC Canada V8B 0A3
Telephone : 604 815 6864
Project : June Samples
PO : 118389
C-O-C number : 17-847348
Sampler : Galem
Site : ----
Quote number : ----
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 3
Laboratory : Vancouver - Environmental
Account Manager : Carla Fuginski
Address : 8081 Lougheed Highway
Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 02-Jun-2020 13:50
Date Analysis Commenced : 05-Jun-2020
Issue Date : 10-Jun-2020 11:07

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Brianna Allen	Department Manager - Organics	Organics, Burnaby, British Columbia
Sandra Cummings	Interim Department Manager - LCMS	LCMS, Waterloo, Ontario



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

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Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	Description
µg/L	micrograms per litre

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.



Analytical Results

Sub-Matrix: Water
 (Matrix: Water)

Client sample ID

					Lomond	Pemberton	View PI	Birken	----
Client sampling date / time					02-Jun-2020 08:50	02-Jun-2020 09:20	02-Jun-2020 09:10	02-Jun-2020 08:35	----
Analyte	CAS Number	Method	LOR	Unit	VA20A7491-001	VA20A7491-002	VA20A7491-003	VA20A7491-004	-----
					Result	Result	Result	Result	----
Trihalomethanes									
bromodichloromethane	75-27-4	E611B	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
bromoform	75-25-2	E611B	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
chloroform	67-66-3	E611B	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
dibromochloromethane	124-48-1	E611B	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
trihalomethanes [THMs], total	----	E611B	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	----
Trihalomethanes Surrogates									
bromofluorobenzene, 4-	460-00-4	E611B	1.0	%	99.1	102	97.1	101	----
difluorobenzene, 1,4-	540-36-3	E611B	1.0	%	103	98.6	99.4	103	----
Haloacetic Acids									
bromochloroacetic acid	5589-96-8	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----
bromodichloroacetic acid	7113-14-7	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----
chlorodibromoacetic acid	5278-95-5	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----
dalapon	75-99-0	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----
dibromoacetic acid	631-64-1	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----
dichloroacetic acid	79-43-6	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----
iodoacetic acid	64-69-7	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----
monobromoacetic acid	79-08-3	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----
monochloroacetic acid	79-11-8	E750	1.00	µg/L	3.67	1.55	1.14	2.36	----
tribromoacetic acid	75-96-7	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----
trichloroacetic acid	76-03-9	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----
haloacetic acids, total [HAA5]	----	E750	5.00	µg/L	<5.00	<5.00	<5.00	<5.00	----
haloacetic acids, total [HAA7]	----	E750	5.00	µg/L	<5.00	<5.00	<5.00	<5.00	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

Semi-Annual Drinking Water Sampling November 2020

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: VA20B8682	Page	: 1 of 7
Amendment	: 1		
Client	: District of Squamish	Laboratory	: Vancouver - Environmental
Contact	: R Chittle	Account Manager	: Carla Fuginski
Address	: 39907 Government Road PO Box 310 Squamish BC Canada V8B 0A3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Oct. Samples	Date Samples Received	: 21-Oct-2020 12:40
PO	: 119099	Date Analysis Commenced	: 21-Oct-2020
C-O-C number	: 17-846865	Issue Date	: 30-Oct-2020 16:03
Sampler	: Calem		
Site	: ----		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Adam Boettger		LCMS, Waterloo, Ontario
Brieanna Allen	Department Manager - Organics	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics - Water Quality, Burnaby, British Columbia
Sandra Cummings	Interim Department Manager - LCMS	LCMS, Waterloo, Ontario



<i>Unit</i>	<i>Description</i>
µg/L	micrograms per litre
CU	colour units (1 CU = 1 mg/L Pt)
mg/L	milligrams per litre
NTU	nephelometric turbidity units



Analytical Results Evaluation

Matrix: Water

				Client sample ID	Power House Springs	----	----	----	----
				Sampling date/time	21-Oct-2020 07:20	----	----	----	----
				Sub-Matrix	Grab	----	----	----	----
Analyte	Method	LOR	Unit	VA20B8682-001	-----	-----	-----	-----	-----
Physical Tests									
alkalinity, bicarbonate (as CaCO ₃)	E290	1.0	mg/L	20.2	----	----	----	----	----
alkalinity, carbonate (as CaCO ₃)	E290	1.0	mg/L	<1.0	----	----	----	----	----
alkalinity, hydroxide (as CaCO ₃)	E290	1.0	mg/L	<1.0	----	----	----	----	----
alkalinity, phenolphthalein (as CaCO ₃)	E290	1.0	mg/L	<1.0	----	----	----	----	----
alkalinity, total (as CaCO ₃)	E290	1.0	mg/L	20.2	----	----	----	----	----
colour, true	E329	5.0	CU	<5.0	----	----	----	----	----
hardness (as CaCO ₃), from total Ca/Mg	EC100A	0.60	mg/L	24.0	----	----	----	----	----
solids, total dissolved [TDS]	E162	10	mg/L	71	----	----	----	----	----
turbidity	E121	0.10	NTU	<0.10	----	----	----	----	----
Anions and Nutrients									
ammonia, total (as N)	E298	0.0050	mg/L	<0.0050	----	----	----	----	----
bromate	E722A	0.00030	mg/L	<0.00030	----	----	----	----	----
bromide	E235.Br-L	0.050	mg/L	<0.050	----	----	----	----	----
chloride	E235.Cl	0.50	mg/L	4.62	----	----	----	----	----
fluoride	E235.F	0.020	mg/L	0.090	----	----	----	----	----
Kjeldahl nitrogen, total [TKN]	E318	0.050	mg/L	<0.050	----	----	----	----	----
nitrate (as N)	E235.NO3-L	0.0050	mg/L	0.0574	----	----	----	----	----
nitrite (as N)	E235.NO2-L	0.0010	mg/L	<0.0010	----	----	----	----	----
nitrogen, total	E366	0.030	mg/L	0.071	----	----	----	----	----
phosphorus, total	E372-U	0.0020	mg/L	0.0364	----	----	----	----	----
sulfate (as SO ₄)	E235.SO4	0.30	mg/L	8.37	----	----	----	----	----
Cyanides									
cyanide, strong acid dissociable (total)	E333	0.0050	mg/L	<0.0050	----	----	----	----	----
Organic / Inorganic Carbon									
carbon, total organic [TOC]	E355-L	0.50	mg/L	<0.50	----	----	----	----	----



Analytical Results Evaluation

Matrix: Water

				Client sample ID	Power House Springs	----	----	----	----
				Sampling date/time	21-Oct-2020 07:20	----	----	----	----
				Sub-Matrix	Grab	----	----	----	----
Analyte	Method	LOR	Unit	VA20B8682-001	-----	-----	-----	-----	-----
Inorganic Parameters									
chlorate	E409.CLO3	0.050	mg/L	<0.050	----	----	----	----	----
Total Metals									
aluminum, total	E420	0.0030	mg/L	<0.0030	----	----	----	----	----
antimony, total	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
arsenic, total	E420	0.00010	mg/L	0.00064	----	----	----	----	----
barium, total	E420	0.00010	mg/L	0.00158	----	----	----	----	----
beryllium, total	E420	0.000100	mg/L	<0.000100	----	----	----	----	----
bismuth, total	E420	0.000050	mg/L	<0.000050	----	----	----	----	----
boron, total	E420	0.010	mg/L	0.021	----	----	----	----	----
cadmium, total	E420	0.0000050	mg/L	<0.0000050	----	----	----	----	----
calcium, total	E420	0.050	mg/L	7.43	----	----	----	----	----
cesium, total	E420	0.000010	mg/L	0.000192	----	----	----	----	----
chromium, total	E420.Cr-L	0.00010	mg/L	<0.00010	----	----	----	----	----
cobalt, total	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
copper, total	E420	0.00050	mg/L	0.0183	----	----	----	----	----
iron, total	E420	0.010	mg/L	<0.010	----	----	----	----	----
lead, total	E420	0.000050	mg/L	<0.000050	----	----	----	----	----
lithium, total	E420	0.0010	mg/L	0.0029	----	----	----	----	----
magnesium, total	E420	0.0050	mg/L	1.31	----	----	----	----	----
manganese, total	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
mercury, total	E508	0.0000050	mg/L	<0.0000050	----	----	----	----	----
molybdenum, total	E420	0.000050	mg/L	0.000579	----	----	----	----	----
nickel, total	E420	0.00050	mg/L	<0.00050	----	----	----	----	----
phosphorus, total	E420	0.050	mg/L	0.056	----	----	----	----	----
potassium, total	E420	0.050	mg/L	1.33	----	----	----	----	----
rubidium, total	E420	0.00020	mg/L	0.00354	----	----	----	----	----
selenium, total	E420	0.000050	mg/L	0.000053	----	----	----	----	----
silicon, total	E420	0.10	mg/L	14.3	----	----	----	----	----
silver, total	E420	0.000010	mg/L	<0.000010	----	----	----	----	----



Analytical Results Evaluation

Matrix: Water

				Client sample ID	Power House Springs	----	----	----	----
				Sampling date/time	21-Oct-2020 07:20	----	----	----	----
				Sub-Matrix	Grab	----	----	----	----
Analyte	Method	LOR	Unit	VA20B8682-001	-----	-----	-----	-----	-----
Total Metals									
sodium, total	E420	0.050	mg/L	4.92	----	----	----	----	----
strontium, total	E420	0.00020	mg/L	0.0763	----	----	----	----	----
sulfur, total	E420	0.50	mg/L	2.51	----	----	----	----	----
tellurium, total	E420	0.00020	mg/L	<0.00020	----	----	----	----	----
thallium, total	E420	0.000010	mg/L	<0.000010	----	----	----	----	----
thorium, total	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
tin, total	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
titanium, total	E420	0.00030	mg/L	<0.00030	----	----	----	----	----
tungsten, total	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
uranium, total	E420	0.000010	mg/L	0.000033	----	----	----	----	----
vanadium, total	E420	0.00050	mg/L	0.0106	----	----	----	----	----
zinc, total	E420	0.0030	mg/L	<0.0030	----	----	----	----	----
zirconium, total	E420	0.00020	mg/L	<0.00020	----	----	----	----	----
Aggregate Organics									
chemical oxygen demand [COD]	E559	20	mg/L	<20	----	----	----	----	----
phenols, total (4AAP)	E562	0.0010	mg/L	<0.0010	----	----	----	----	----



Analytical Results Evaluation

Matrix: Water

Matrix: Water				Client sample ID	Birken	Pemberton	View	Iomond	----
				Sampling date/time	21-Oct-2020 08:42	21-Oct-2020 08:15	21-Oct-2020 08:00	21-Oct-2020 09:00	----
				Sub-Matrix	Water	Water	Water	Water	----
Analyte	Method	LOR	Unit	VA20B8682-002	VA20B8682-003	VA20B8682-004	VA20B8682-005	-----	
Volatile Organic Compounds [THMs]									
bromodichloromethane	E611B	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----	
bromoform	E611B	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----	
chloroform	E611B	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----	
dibromochloromethane	E611B	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----	
trihalomethanes [THMs], total	E611B	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	----	
Volatile Organic Compounds [THMs] Surrogates									
bromofluorobenzene, 4-	E611B	1.0	%	101	101	101	99.5	----	
difluorobenzene, 1,4-	E611B	1.0	%	99.4	102	100	93.5	----	
Haloacetic Acids									
bromochloroacetic acid	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----	
dibromoacetic acid	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----	
dichloroacetic acid	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----	
monobromoacetic acid	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----	
monochloroacetic acid	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----	
trichloroacetic acid	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	----	
haloacetic acids, total [HAA5]	E750	5.00	µg/L	<5.00	<5.00	<5.00	<5.00	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.



Summary of Guideline Breaches by Sample

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit

- Keys:
- CDWG

AO/OG

MAC

MAC-SGW

MAC-TW
- Canada Guidelines for Canadian Drinking Water Quality (JAN, 2020)

Aesthetic Objective/Operational Guideline

Maximum Acceptable Concentrations

Maximum Acceptable Concentrations for Secure GW source

Maximum Acceptable Concentrations for Treated Water



Environmental

CERTIFICATE OF ANALYSIS

Work Order : **VA20B8682**

Amendment : **1**

Client : **District of Squamish**

Contact : R Chittle

Address : 39907 Government Road PO Box 310
Squamish BC Canada V8B 0A3

Telephone : ----

Project : Oct. Samples

PO : 119099

C-O-C number : 17-846865

Sampler : Calem

Site : ----

Quote number : ----

No. of samples received : 5

No. of samples analysed : 5

Page : 1 of 6

Laboratory : Vancouver - Environmental

Account Manager : Carla Fuginski

Address : 8081 Lougheed Highway
Burnaby BC Canada V5A 1W9

Telephone : +1 604 253 4188

Date Samples Received : 21-Oct-2020 12:40

Date Analysis Commenced : 21-Oct-2020

Issue Date : 30-Oct-2020 16:04

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Adam Boettger		LCMS, Waterloo, Ontario
Brieanna Allen	Department Manager - Organics	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics - Water Quality, Burnaby, British Columbia
Sandra Cummings	Interim Department Manager - LCMS	LCMS, Waterloo, Ontario



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Unit	Description
µg/L	micrograms per litre
CU	colour units (1 CU = 1 mg/L Pt)
mg/L	milligrams per litre
NTU	nephelometric turbidity units

<: less than.

>: greater than.

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Analytical Results

Sub-Matrix: Grab					Client sample ID	Power House Springs	----	----	----	----
(Matrix: Water)					Client sampling date / time	21-Oct-2020 07:20	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20B8682-001	Result	----	----	----	----
Physical Tests										
alkalinity, bicarbonate (as CaCO ₃)	----	E290	1.0	mg/L	20.2	----	----	----	----	----
alkalinity, carbonate (as CaCO ₃)	----	E290	1.0	mg/L	<1.0	----	----	----	----	----
alkalinity, hydroxide (as CaCO ₃)	----	E290	1.0	mg/L	<1.0	----	----	----	----	----
alkalinity, phenolphthalein (as CaCO ₃)	----	E290	1.0	mg/L	<1.0	----	----	----	----	----
alkalinity, total (as CaCO ₃)	----	E290	1.0	mg/L	20.2	----	----	----	----	----
colour, true	----	E329	5.0	CU	<5.0	----	----	----	----	----
hardness (as CaCO ₃), from total Ca/Mg	----	EC100A	0.60	mg/L	24.0	----	----	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L	71	----	----	----	----	----
turbidity	----	E121	0.10	NTU	<0.10	----	----	----	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	----	----	----	----	----
bromate	15541-45-4	E722A	0.00030	mg/L	<0.00030	----	----	----	----	----
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	----	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	4.62	----	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.090	----	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	<0.050	----	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0574	----	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	----	----	----	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	0.071	----	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0364	----	----	----	----	----
sulfate (as SO ₄)	14808-79-8	E235.SO4	0.30	mg/L	8.37	----	----	----	----	----
Cyanides										
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	<0.0050	----	----	----	----	----
Organic / Inorganic Carbon										
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	----	----	----	----	----
Inorganic Parameters										
chlorate	14866-68-3	E409.CLO3	0.050	mg/L	<0.050	----	----	----	----	----
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	----	----	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	----	----	----	----	----



Analytical Results

Sub-Matrix: Grab (Matrix: Water)					Client sample ID	Power House Springs	----	----	----	----
Client sampling date / time						21-Oct-2020 07:20	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20B8682-001	Result	----	----	----	----
Total Metals										
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00064	----	----	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L	0.00158	----	----	----	----	----
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	----	----	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	----	----	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L	0.021	----	----	----	----	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	----	----	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L	7.43	----	----	----	----	----
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000192	----	----	----	----	----
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	<0.00010	----	----	----	----	----
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L	0.0183	----	----	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	----	----	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	----	----	----	----	----
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0029	----	----	----	----	----
magnesium, total	7439-95-4	E420	0.0050	mg/L	1.31	----	----	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	----	----	----	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000579	----	----	----	----	----
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	----	----	----	----	----
phosphorus, total	7723-14-0	E420	0.050	mg/L	0.056	----	----	----	----	----
potassium, total	7440-09-7	E420	0.050	mg/L	1.33	----	----	----	----	----
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00354	----	----	----	----	----
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000053	----	----	----	----	----
silicon, total	7440-21-3	E420	0.10	mg/L	14.3	----	----	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	----	----	----	----	----
sodium, total	17341-25-2	E420	0.050	mg/L	4.92	----	----	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L	0.0763	----	----	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	2.51	----	----	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	----	----	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	----	----	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	----	----	----	----	----



Analytical Results

Sub-Matrix: Grab (Matrix: Water)			Client sample ID		Power House Springs	----	----	----	----
Client sampling date / time					21-Oct-2020 07:20	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20B8682-001	-----	-----	-----	-----
					Result	----	----	----	----
Total Metals									
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	----	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	----	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	----	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000033	----	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L	0.0106	----	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	----	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	----	----	----	----
Aggregate Organics									
chemical oxygen demand [COD]	----	E559	20	mg/L	<20	----	----	----	----
phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Birken	Pemberton	View	lomond	----
Client sampling date / time						21-Oct-2020 08:42	21-Oct-2020 08:15	21-Oct-2020 08:00	21-Oct-2020 09:00	----
Analyte	CAS Number	Method	LOR	Unit	VA20B8682-002	VA20B8682-003	VA20B8682-004	VA20B8682-005	-----	
					Result	Result	Result	Result	-----	
Volatile Organic Compounds [THMs]										
bromodichloromethane	75-27-4	E611B	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	----
bromoform	75-25-2	E611B	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	----
chloroform	67-66-3	E611B	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	----
dibromochloromethane	124-48-1	E611B	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	----
trihalomethanes [THMs], total	----	E611B	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	----
Volatile Organic Compounds [THMs] Surrogates										
bromofluorobenzene, 4-	460-00-4	E611B	1.0	%	101	101	101	99.5	99.5	----
difluorobenzene, 1,4-	540-36-3	E611B	1.0	%	99.4	102	100	93.5	93.5	----
Haloacetic Acids										
bromochloroacetic acid	5589-96-8	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	----
dibromoacetic acid	631-64-1	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	----
dichloroacetic acid	79-43-6	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	----
monobromoacetic acid	79-08-3	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	----
monochloroacetic acid	79-11-8	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	----
trichloroacetic acid	76-03-9	E750	1.00	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	----
haloacetic acids, total [HAA5]	----	E750	5.00	µg/L	<5.00	<5.00	<5.00	<5.00	<5.00	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA20B8682	Page	: 1 of 13
Amendment	: 1		
Client	: District of Squamish	Laboratory	: Vancouver - Environmental
Contact	: R Chittle	Account Manager	: Carla Fuginski
Address	: 39907 Government Road PO Box 310 Squamish BC Canada V8B 0A3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Oct. Samples	Date Samples Received	: 21-Oct-2020 12:40
PO	: 119099	Issue Date	: 30-Oct-2020 16:04
C-O-C number	: 17-846865		
Sampler	: Calem		
Site	: ----		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry										
Amber glass total (sulfuric acid) Power House Springs	E559	21-Oct-2020	----	----	----		22-Oct-2020	28 days	1 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) Power House Springs	E562	21-Oct-2020	----	----	----		28-Oct-2020	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Power House Springs	E298	21-Oct-2020	----	----	----		26-Oct-2020	28 days	4 days	✓
Anions and Nutrients : Bromate and Perchlorate in Water by LC-MS-MS										
Opaque HDPE (EDA) Power House Springs	E722A	21-Oct-2020	28-Oct-2020	28 days	7 days	✓	28-Oct-2020	28 days	0 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE Power House Springs	E235.Br-L	21-Oct-2020	----	----	----		22-Oct-2020	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Power House Springs	E235.Cl	21-Oct-2020	----	----	----		22-Oct-2020	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Power House Springs	E235.F	21-Oct-2020	----	----	----		22-Oct-2020	28 days	1 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Power House Springs	E235.NO3-L	21-Oct-2020	----	----	----		22-Oct-2020	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Power House Springs	E235.NO2-L	21-Oct-2020	----	----	----		22-Oct-2020	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Power House Springs	E235.SO4	21-Oct-2020	----	----	----		22-Oct-2020	28 days	1 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Power House Springs	E318	21-Oct-2020	24-Oct-2020	28 days	3 days	✓	26-Oct-2020	24 days	2 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) Power House Springs	E366	21-Oct-2020	24-Oct-2020	28 days	3 days	✓	27-Oct-2020	24 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)										
Amber glass total (sulfuric acid) Power House Springs	E372-U	21-Oct-2020	24-Oct-2020	28 days	3 days	✓	25-Oct-2020	24 days	0 days	✓
Cyanides : Total Cyanide by CFA										
UV inhibited HDPE - total (sodium hydroxide) Power House Springs	E333	21-Oct-2020	----	----	----		26-Oct-2020	14 days	4 days	✓
Haloacetic Acids : Determination of Haloacetic Acids in Water by LC-MS/MS										
Glass vial (ammonium chloride) Birken	E750	21-Oct-2020	30-Oct-2020	14 days	8 days	✓	30-Oct-2020	5 days	0 days	✓
Haloacetic Acids : Determination of Haloacetic Acids in Water by LC-MS/MS										
Glass vial (ammonium chloride) Iomond	E750	21-Oct-2020	30-Oct-2020	14 days	8 days	✓	30-Oct-2020	5 days	0 days	✓



Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Haloacetic Acids : Determination of Haloacetic Acids in Water by LC-MS/MS										
Glass vial (ammonium chloride) Pemberton	E750	21-Oct-2020	30-Oct-2020	14 days	8 days	✓	30-Oct-2020	5 days	0 days	✓
Haloacetic Acids : Determination of Haloacetic Acids in Water by LC-MS/MS										
Glass vial (ammonium chloride) View	E750	21-Oct-2020	30-Oct-2020	14 days	8 days	✓	30-Oct-2020	5 days	0 days	✓
Inorganic Parameters : Chlorate (CLO3) in Waters by Ion Chromatography										
Opaque HDPE (EDA) Power House Springs	E409.CLO3	21-Oct-2020	----	----	----		28-Oct-2020	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Power House Springs	E355-L	21-Oct-2020	----	----	----		25-Oct-2020	28 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Power House Springs	E290	21-Oct-2020	----	----	----		22-Oct-2020	14 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer										
HDPE Power House Springs	E329	21-Oct-2020	----	----	----		22-Oct-2020	3 days	1 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Power House Springs	E162	21-Oct-2020	----	----	----		27-Oct-2020	7 days	6 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE Power House Springs	E121	21-Oct-2020	----	----	----		21-Oct-2020	3 days	0 days	✓
Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)										
HDPE total (nitric acid) Power House Springs	E420.Cr-L	21-Oct-2020	----	----	----		30-Oct-2020	180 days	8 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Power House Springs	E508	21-Oct-2020	----	----	----		27-Oct-2020	28 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Power House Springs	E420	21-Oct-2020	----	----	----		30-Oct-2020	180 days	8 days	✓
Volatile Organic Compounds [THMs] : THMs by Headspace GC-MS										
Glass vial (sodium bisulfate) Birken	E611B	21-Oct-2020	26-Oct-2020	14 days	5 days	✓	27-Oct-2020	8 days	0 days	✓
Volatile Organic Compounds [THMs] : THMs by Headspace GC-MS										
Glass vial (sodium bisulfate) Iomond	E611B	21-Oct-2020	26-Oct-2020	14 days	5 days	✓	27-Oct-2020	8 days	0 days	✓
Volatile Organic Compounds [THMs] : THMs by Headspace GC-MS										
Glass vial (sodium bisulfate) Pemberton	E611B	21-Oct-2020	26-Oct-2020	14 days	5 days	✓	27-Oct-2020	8 days	0 days	✓
Volatile Organic Compounds [THMs] : THMs by Headspace GC-MS										
Glass vial (sodium bisulfate) View	E611B	21-Oct-2020	26-Oct-2020	14 days	5 days	✓	27-Oct-2020	8 days	0 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
Analytical Methods			QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	106377	1	15	6.6	5.0	✔
Ammonia by Fluorescence	E298	107877	1	14	7.1	5.0	✔
Bromate and Perchlorate in Water by LC-MS-MS	E722A	109489	1	1	100.0	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	106397	1	4	25.0	5.0	✔
Chemical Oxygen Demand by Colourimetry	E559	106461	1	17	5.8	5.0	✔
Chlorate (CLO3) in Waters by Ion Chromatography	E409.CLO3	109328	1	1	100.0	5.0	✔
Chloride in Water by IC	E235.Cl	106396	1	4	25.0	5.0	✔
Colour (True) by Spectrometer	E329	106387	1	1	100.0	5.0	✔
Determination of Haloacetic Acids in Water by LC-MS/MS	E750	110768	1	7	14.2	5.0	✔
Fluoride in Water by IC	E235.F	106395	1	9	11.1	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	106398	1	9	11.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	106399	1	9	11.1	5.0	✔
Phenols (4AAP) in Water by Colorimetry	E562	109009	1	17	5.8	5.0	✔
Sulfate in Water by IC	E235.SO4	106400	1	5	20.0	5.0	✔
TDS by Gravimetry	E162	108858	1	20	5.0	5.0	✔
THMs by Headspace GC-MS	E611B	108474	1	5	20.0	5.0	✔
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	107774	1	6	16.6	5.0	✔
Total Cyanide by CFA	E333	108130	1	18	5.5	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	107878	1	7	14.2	5.0	✔
Total Mercury in Water by CVAAS	E508	109047	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	107773	1	19	5.2	5.0	✔
Total Nitrogen by Colourimetry	E366	107876	1	20	5.0	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	107879	1	11	9.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	107880	1	12	8.3	5.0	✔
Turbidity by Nephelometry	E121	106163	1	15	6.6	5.0	✔
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	106377	1	15	6.6	5.0	✔
Ammonia by Fluorescence	E298	107877	1	14	7.1	5.0	✔
Bromate and Perchlorate in Water by LC-MS-MS	E722A	109489	1	1	100.0	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	106397	1	4	25.0	5.0	✔
Chemical Oxygen Demand by Colourimetry	E559	106461	1	17	5.8	5.0	✔
Chlorate (CLO3) in Waters by Ion Chromatography	E409.CLO3	109328	1	1	100.0	5.0	✔
Chloride in Water by IC	E235.Cl	106396	1	4	25.0	5.0	✔
Colour (True) by Spectrometer	E329	106387	1	1	100.0	5.0	✔
Determination of Haloacetic Acids in Water by LC-MS/MS	E750	110768	1	7	14.2	5.0	✔
Fluoride in Water by IC	E235.F	106395	1	9	11.1	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	106398	1	9	11.1	5.0	✔



Matrix: **Water**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Control Samples (LCS) - Continued							
Nitrite in Water by IC (Low Level)	E235.NO2-L	106399	1	9	11.1	5.0	✔
Phenols (4AAP) in Water by Colorimetry	E562	109009	1	17	5.8	5.0	✔
Sulfate in Water by IC	E235.SO4	106400	1	5	20.0	5.0	✔
TDS by Gravimetry	E162	108858	1	20	5.0	5.0	✔
THMs by Headspace GC-MS	E611B	108474	1	5	20.0	5.0	✔
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	107774	1	6	16.6	5.0	✔
Total Cyanide by CFA	E333	108130	1	18	5.5	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	107878	1	7	14.2	5.0	✔
Total Mercury in Water by CVAAS	E508	109047	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	107773	1	19	5.2	5.0	✔
Total Nitrogen by Colourimetry	E366	107876	1	20	5.0	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	107879	1	11	9.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	107880	1	12	8.3	5.0	✔
Turbidity by Nephelometry	E121	106163	1	15	6.6	5.0	✔
Method Blanks (MB)							
Alkalinity Species by Titration	E290	106377	1	15	6.6	5.0	✔
Ammonia by Fluorescence	E298	107877	1	14	7.1	5.0	✔
Bromate and Perchlorate in Water by LC-MS-MS	E722A	109489	1	1	100.0	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	106397	1	4	25.0	5.0	✔
Chemical Oxygen Demand by Colourimetry	E559	106461	1	17	5.8	5.0	✔
Chlorate (CLO3) in Waters by Ion Chromatography	E409.CLO3	109328	1	1	100.0	5.0	✔
Chloride in Water by IC	E235.Cl	106396	1	4	25.0	5.0	✔
Colour (True) by Spectrometer	E329	106387	1	1	100.0	5.0	✔
Determination of Haloacetic Acids in Water by LC-MS/MS	E750	110768	1	7	14.2	5.0	✔
Fluoride in Water by IC	E235.F	106395	1	9	11.1	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	106398	1	9	11.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	106399	1	9	11.1	5.0	✔
Phenols (4AAP) in Water by Colorimetry	E562	109009	1	17	5.8	5.0	✔
Sulfate in Water by IC	E235.SO4	106400	1	5	20.0	5.0	✔
TDS by Gravimetry	E162	108858	1	20	5.0	5.0	✔
THMs by Headspace GC-MS	E611B	108474	1	5	20.0	5.0	✔
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	107774	1	6	16.6	5.0	✔
Total Cyanide by CFA	E333	108130	1	18	5.5	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	107878	1	7	14.2	5.0	✔
Total Mercury in Water by CVAAS	E508	109047	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	107773	1	19	5.2	5.0	✔
Total Nitrogen by Colourimetry	E366	107876	1	20	5.0	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	107879	1	11	9.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	107880	1	12	8.3	5.0	✔
Turbidity by Nephelometry	E121	106163	1	15	6.6	5.0	✔



Matrix: **Water**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	107877	1	14	7.1	5.0	✔
Bromate and Perchlorate in Water by LC-MS-MS	E722A	109489	1	1	100.0	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	106397	1	4	25.0	5.0	✔
Chemical Oxygen Demand by Colourimetry	E559	106461	1	17	5.8	5.0	✔
Chlorate (CLO3) in Waters by Ion Chromatography	E409.CLO3	109328	1	1	100.0	5.0	✔
Chloride in Water by IC	E235.Cl	106396	1	4	25.0	5.0	✔
Determination of Haloacetic Acids in Water by LC-MS/MS	E750	110768	1	7	14.2	5.0	✔
Fluoride in Water by IC	E235.F	106395	1	9	11.1	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	106398	1	9	11.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	106399	1	9	11.1	5.0	✔
Phenols (4AAP) in Water by Colorimetry	E562	109009	1	17	5.8	5.0	✔
Sulfate in Water by IC	E235.SO4	106400	1	5	20.0	5.0	✔
THMs by Headspace GC-MS	E611B	108474	1	5	20.0	5.0	✔
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	107774	1	6	16.6	5.0	✔
Total Cyanide by CFA	E333	108130	1	18	5.5	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	107878	1	7	14.2	5.0	✔
Total Mercury in Water by CVAAS	E508	109047	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	107773	1	19	5.2	5.0	✔
Total Nitrogen by Colourimetry	E366	107876	1	20	5.0	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	107879	1	11	9.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	107880	1	12	8.3	5.0	✔



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry	E162 Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at $180 \pm 2^{\circ}\text{C}$ for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthalaldehyde (OPA).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Colour (True) by Spectrometer	E329 Vancouver - Environmental	Water	APHA 2120 C (mod)	Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Total Cyanide by CFA	E333 Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Chlorate (CLO ₃) in Waters by Ion Chromatography	E409.CLO ₃ Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity detection.
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Chemical Oxygen Demand by Colourimetry	E559 Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 Waterloo - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K ₃ Fe(CN) ₆) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
THMs by Headspace GC-MS	E611B Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Bromate and Perchlorate in Water by LC-MS-MS	E722A Waterloo - Environmental	Water	EPA 6850	A aliquot of the water sample is filtered and an internal standard is added. The sample is then analyzed by LC/MS/MS.
Determination of Haloacetic Acids in Water by LC-MS/MS	E750 Waterloo - Environmental	Water	MOE E3478	An aliquot of sample is fortified with formic acid and internal standards and analyzed via direct injection by LCMSMS
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.

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Work Order : VA20B8682 Amendment 1
Client : District of Squamish
Project : Oct. Samples



Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation of Bromate and Perchlorate in Water by LC-MS-MS	EP722 Waterloo - Environmental	Water	EPA 6850	An aliquot of the water sample is filtered if required and internal standard is added.
Preparation of Haloacetic acid in Water for LCMSMS	EP750 Waterloo - Environmental	Water	E3478	An aliquot of samples is fortified with formic acid and internal standard to be analyzed by direct injection LCMSMS

QUALITY CONTROL REPORT

Work Order : **VA20B8682**

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Amendment : **1**

Client : District of Squamish
Contact : R Chittle
Address : 39907 Government Road PO Box 310
 Squamish BC Canada V8B 0A3
Telephone : ----
Project : Oct. Samples
PO : 119099
C-O-C number : 17-846865
Sampler : Calem
Site : ----
Quote number : ----
No. of samples received : 5
No. of samples analysed : 5

Laboratory : Vancouver - Environmental
Account Manager : Carla Fuginski
Address : 8081 Lougheed Highway
 Burnaby, British Columbia Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 21-Oct-2020 12:40
Date Analysis Commenced : 21-Oct-2020
Issue Date : 30-Oct-2020 16:03

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Adam Boettger		LCMS, Waterloo, Ontario
Brieanna Allen	Department Manager - Organics	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics - Water Quality, Burnaby, British Columbia
Sandra Cummings	Interim Department Manager - LCMS	LCMS, Waterloo, Ontario



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 106163)											
VA20B8669-001	Anonymous	turbidity	----	E121	0.10	NTU	78.7	77.7	1.28%	15%	----
Physical Tests (QC Lot: 106377)											
VA20B8651-002	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	76.1	75.9	0.263%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	76.1	75.9	0.263%	20%	----
Physical Tests (QC Lot: 106387)											
VA20B8682-001	Power House Springs	colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 108858)											
VA20B8682-001	Power House Springs	solids, total dissolved [TDS]	----	E162	13	mg/L	71	71	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 106395)											
VA20B8682-001	Power House Springs	fluoride	16984-48-8	E235.F	0.020	mg/L	0.090	0.088	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 106396)											
VA20B8682-001	Power House Springs	chloride	16887-00-6	E235.Cl	0.50	mg/L	4.62	4.60	0.01	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 106397)											
VA20B8682-001	Power House Springs	bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 106398)											
VA20B8682-001	Power House Springs	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0574	0.0574	0.185%	20%	----
Anions and Nutrients (QC Lot: 106399)											
VA20B8682-001	Power House Springs	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 106400)											
VA20B8682-001	Power House Springs	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	8.37	8.34	0.386%	20%	----
Anions and Nutrients (QC Lot: 107876)											
VA20B8644-025	Anonymous	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.036	0.034	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 107877)											
VA20B8669-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.121	0.118	2.30%	20%	----
Anions and Nutrients (QC Lot: 107878)											
VA20B8682-001	Power House Springs	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 107880)											
VA20B8669-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0200	mg/L	0.0770	0.0765	0.0006	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Anions and Nutrients (QC Lot: 109489)											
VA20B8682-001	Power House Springs	bromate	15541-45-4	E722A	0.0003	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
Cyanides (QC Lot: 108130)											
VA20B8682-001	Power House Springs	cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 107879)											
VA20B8682-001	Power House Springs	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Inorganic Parameters (QC Lot: 109328)											
VA20B8682-001	Power House Springs	chlorate	14866-68-3	E409.CLO3	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Total Metals (QC Lot: 107773)											
VA20B8676-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0780	0.0814	4.39%	20%	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.00583	0.00551	5.69%	20%	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00021	0.00022	0.00002	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.104	0.102	1.51%	20%	----
		beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.022	0.021	0.0008	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000292	0.0000302	0.0000009	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	102	101	0.896%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000013	0.000013	0.0000002	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00014	0.00013	0.00001	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00176	0.00193	0.00016	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.109	0.111	1.82%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000082	0.000082	0.00000007	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0113	0.0112	1.19%	20%	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	33.9	33.8	0.232%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.00259	0.00256	0.846%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00201	0.00186	8.08%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	0.00076	0.00072	0.00004	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	2.26	2.27	0.316%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00084	0.00095	0.00012	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.0172	0.0176	1.89%	20%	----
		silicon, total	7440-21-3	E420	0.10	mg/L	3.64	3.79	4.09%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	17341-25-2	E420	0.050	mg/L	60.0	64.0	6.39%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	1.35	1.32	2.23%	20%	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 107773) - continued											
VA20B8676-001	Anonymous	sulfur, total	7704-34-9	E420	0.50	mg/L	105	108	2.04%	20%	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	0.00028	0.00031	0.00002	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	0.00097	0.00093	0.00004	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.00103	0.00101	1.92%	20%	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 107774)											
VA20B8676-001	Anonymous	chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00030	0.00028	0.00002	Diff <2x LOR	----
Total Metals (QC Lot: 109047)											
VA20B8682-001	Power House Springs	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 106461)											
VA20B8506-001	Anonymous	chemical oxygen demand [COD]	----	E559	20	mg/L	<20	<20	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 109009)											
VA20B8682-001	Power House Springs	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Volatile Organic Compounds [THMs] (QC Lot: 108474)											
VA20B8682-002	Birken	bromodichloromethane	75-27-4	E611B	1.0	µg/L	<1.0	<1.0	0.00%	30%	----
		bromoform	75-25-2	E611B	1.0	µg/L	<1.0	<1.0	0.00%	30%	----
		chloroform	67-66-3	E611B	1.0	µg/L	<1.0	<1.0	0.00%	30%	----
		dibromochloromethane	124-48-1	E611B	1.0	µg/L	<1.0	<1.0	0.00%	30%	----
Haloacetic Acids (QC Lot: 110768)											
KS2002271-001	Anonymous	bromochloroacetic acid	5589-96-8	E750	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		dibromoacetic acid	631-64-1	E750	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		dichloroacetic acid	79-43-6	E750	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		monobromoacetic acid	79-08-3	E750	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		monochloroacetic acid	79-11-8	E750	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		trichloroacetic acid	76-03-9	E750	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 106163)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 106377)						
alkalinity, bicarbonate (as CaCO ₃)	----	E290	1	mg/L	1.4	----
alkalinity, carbonate (as CaCO ₃)	----	E290	1	mg/L	<1.0	----
alkalinity, hydroxide (as CaCO ₃)	----	E290	1	mg/L	<1.0	----
alkalinity, phenolphthalein (as CaCO ₃)	----	E290	1	mg/L	<1.0	----
alkalinity, total (as CaCO ₃)	----	E290	1	mg/L	1.4	----
Physical Tests (QCLot: 106387)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 108858)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 106395)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 106396)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 106397)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 106398)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 106399)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 106400)						
sulfate (as SO ₄)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 107876)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 107877)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 107878)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 107880)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 109489)						
bromate	15541-45-4	E722A	0.3	µg/L	<0.30	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Cyanides (QCLot: 108130)						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
Organic / Inorganic Carbon (QCLot: 107879)						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
Inorganic Parameters (QCLot: 109328)						
chlorate	14866-68-3	E409.CLO3	0.05	mg/L	<0.050	---
Total Metals (QCLot: 107773)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	---
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	---
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	---
sodium, total	17341-25-2	E420	0.05	mg/L	<0.050	---
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	---
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	---
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 107773) - continued						
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 107774)						
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	<0.00010	----
Total Metals (QCLot: 109047)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 106461)						
chemical oxygen demand [COD]	----	E559	20	mg/L	<20	----
Aggregate Organics (QCLot: 109009)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds [THMs] (QCLot: 108474)						
bromodichloromethane	75-27-4	E611B	1	µg/L	<1.0	----
bromoform	75-25-2	E611B	1	µg/L	<1.0	----
chloroform	67-66-3	E611B	1	µg/L	<1.0	----
dibromochloromethane	124-48-1	E611B	1	µg/L	<1.0	----
Haloacetic Acids (QCLot: 110768)						
bromochloroacetic acid	5589-96-8	E750	0.25	µg/L	<0.25	----
dibromoacetic acid	631-64-1	E750	0.5	µg/L	<0.50	----
dichloroacetic acid	79-43-6	E750	0.5	µg/L	<0.50	----
monobromoacetic acid	79-08-3	E750	0.1	µg/L	<0.10	----
monochloroacetic acid	79-11-8	E750	0.25	µg/L	<0.25	----
trichloroacetic acid	76-03-9	E750	0.5	µg/L	<0.50	----

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 106163)									
turbidity	----	E121	0.1	NTU	200 NTU	101	85.0	115	----
Physical Tests (QCLot: 106377)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	102	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	98.2	85.0	115	----
Physical Tests (QCLot: 106387)									
colour, true	----	E329	5	CU	100 CU	100	85.0	115	----
Physical Tests (QCLot: 108858)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 106395)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 106396)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 106397)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	93.4	85.0	115	----
Anions and Nutrients (QCLot: 106398)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 106399)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 106400)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 107876)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 107877)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.12 mg/L	92.7	85.0	115	----
Anions and Nutrients (QCLot: 107878)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	99.2	75.0	125	----
Anions and Nutrients (QCLot: 107880)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	90.1	80.0	120	----
Anions and Nutrients (QCLot: 109489)									
bromate	15541-45-4	E722A	0.3	µg/L	4 µg/L	112	70.0	130	----
Cyanides (QCLot: 108130)									



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Cyanides (QCLot: 108130) - continued									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	92.3	80.0	120	----
Organic / Inorganic Carbon (QCLot: 107879)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	94.7	80.0	120	----
Inorganic Parameters (QCLot: 109328)									
chlorate	14866-68-3	E409.CLO3	0.05	mg/L	1 mg/L	100	85.0	115	----
Total Metals (QCLot: 107773)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	104	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	100	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	94.7	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	109	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	97.9	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	94.4	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	98.7	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	110	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	109	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	103	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	103	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	110	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	100	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	98.9	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	100	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	89.2	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	102	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	94.9	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	98.0	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	110	80.0	120	----
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	97.4	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	111	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	84.3	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	99.5	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 107773) - continued									
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	95.8	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	96.7	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	92.7	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	91.4	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	91.7	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	106	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	96.1	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
Total Metals (QCLot: 107774)									
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
Total Metals (QCLot: 109047)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	106	80.0	120	----
Aggregate Organics (QCLot: 106461)									
chemical oxygen demand [COD]	----	E559	20	mg/L	750 mg/L	97.9	85.0	115	----
Aggregate Organics (QCLot: 109009)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	95.6	85.0	115	----
Volatile Organic Compounds [THMs] (QCLot: 108474)									
bromodichloromethane	75-27-4	E611B	1	µg/L	100 µg/L	109	70.0	130	----
bromoform	75-25-2	E611B	1	µg/L	100 µg/L	96.1	70.0	130	----
chloroform	67-66-3	E611B	1	µg/L	100 µg/L	124	70.0	130	----
dibromochloromethane	124-48-1	E611B	1	µg/L	100 µg/L	101	70.0	130	----
Haloacetic Acids (QCLot: 110768)									
bromochloroacetic acid	5589-96-8	E750	0.25	µg/L	2.5 µg/L	96.4	70.0	130	----
dibromoacetic acid	631-64-1	E750	0.5	µg/L	5 µg/L	107	70.0	130	----
dichloroacetic acid	79-43-6	E750	0.5	µg/L	5 µg/L	98.2	70.0	130	----
monobromoacetic acid	79-08-3	E750	0.1	µg/L	1 µg/L	105	70.0	130	----
monochloroacetic acid	79-11-8	E750	0.25	µg/L	2.5 µg/L	96.0	70.0	130	----
trichloroacetic acid	76-03-9	E750	0.5	µg/L	5 µg/L	105	70.0	130	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1 \times$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 106395)										
VA20B8711-001	Anonymous	fluoride	16984-48-8	E235.F	4.92 mg/L	5 mg/L	98.4	75.0	125	----
Anions and Nutrients (QCLot: 106396)										
VA20B8711-001	Anonymous	chloride	16887-00-6	E235.Cl	496 mg/L	500 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 106397)										
VA20B8711-001	Anonymous	bromide	24959-67-9	E235.Br-L	2.18 mg/L	2.5 mg/L	87.2	75.0	125	----
Anions and Nutrients (QCLot: 106398)										
VA20B8711-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	12.3 mg/L	12.5 mg/L	98.7	75.0	125	----
Anions and Nutrients (QCLot: 106399)										
VA20B8711-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	2.46 mg/L	2.5 mg/L	98.5	75.0	125	----
Anions and Nutrients (QCLot: 106400)										
VA20B8711-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	491 mg/L	500 mg/L	98.3	75.0	125	----
Anions and Nutrients (QCLot: 107876)										
VA20B8644-026	Anonymous	nitrogen, total	7727-37-9	E366	0.430 mg/L	0.4 mg/L	108	70.0	130	----
Anions and Nutrients (QCLot: 107877)										
VA20B8682-001	Power House Springs	ammonia, total (as N)	7664-41-7	E298	0.203 mg/L	0.2 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 107878)										
VA20B8764-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	12.5 mg/L	ND	70.0	130	MS-B
Anions and Nutrients (QCLot: 107880)										
VA20B8682-001	Power House Springs	phosphorus, total	7723-14-0	E372-U	0.0475 mg/L	0.05 mg/L	95.1	70.0	130	----
Anions and Nutrients (QCLot: 109489)										
VA20B8682-001	Power House Springs	bromate	15541-45-4	E722A	4.45 µg/L	4 µg/L	111	70.0	130	----
Cyanides (QCLot: 108130)										
VA20B8800-003	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.228 mg/L	0.25 mg/L	91.0	75.0	125	----
Organic / Inorganic Carbon (QCLot: 107879)										
VA20B8684-001	Anonymous	carbon, total organic [TOC]	----	E355-L	5.13 mg/L	5 mg/L	103	70.0	130	----
Inorganic Parameters (QCLot: 109328)										
VA20B8682-001	Power House Springs	chlorate	14866-68-3	E409.CLO3	0.989 mg/L	1 mg/L	98.9	75.0	125	----



Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 107773)										
VA20B8682-001	Power House Springs	aluminum, total	7429-90-5	E420	0.199 mg/L	0.2 mg/L	99.6	70.0	130	----
		antimony, total	7440-36-0	E420	0.0209 mg/L	0.02 mg/L	105	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		barium, total	7440-39-3	E420	0.0196 mg/L	0.02 mg/L	98.2	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0427 mg/L	0.04 mg/L	107	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00959 mg/L	0.01 mg/L	95.9	70.0	130	----
		boron, total	7440-42-8	E420	0.094 mg/L	0.1 mg/L	93.9	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00393 mg/L	0.004 mg/L	98.3	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0106 mg/L	0.01 mg/L	106	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		copper, total	7440-50-8	E420	0.0197 mg/L	0.02 mg/L	98.4	70.0	130	----
		iron, total	7439-89-6	E420	2.01 mg/L	2 mg/L	100	70.0	130	----
		lead, total	7439-92-1	E420	0.0186 mg/L	0.02 mg/L	92.9	70.0	130	----
		lithium, total	7439-93-2	E420	0.107 mg/L	0.1 mg/L	107	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	0.0196 mg/L	0.02 mg/L	97.8	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		nickel, total	7440-02-0	E420	0.0398 mg/L	0.04 mg/L	99.6	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.20 mg/L	10 mg/L	92.0	70.0	130	----
		potassium, total	7440-09-7	E420	3.91 mg/L	4 mg/L	97.7	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0191 mg/L	0.02 mg/L	95.5	70.0	130	----
		selenium, total	7782-49-2	E420	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		silicon, total	7440-21-3	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, total	7440-22-4	E420	0.00424 mg/L	0.004 mg/L	106	70.0	130	----
		sodium, total	17341-25-2	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	19.4 mg/L	20 mg/L	97.1	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		thallium, total	7440-28-0	E420	0.00372 mg/L	0.004 mg/L	93.1	70.0	130	----
		thorium, total	7440-29-1	E420	0.0185 mg/L	0.02 mg/L	92.6	70.0	130	----
		tin, total	7440-31-5	E420	0.0196 mg/L	0.02 mg/L	98.1	70.0	130	----
		titanium, total	7440-32-6	E420	0.0400 mg/L	0.04 mg/L	100.0	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0186 mg/L	0.02 mg/L	92.8	70.0	130	----
		uranium, total	7440-61-1	E420	0.00397 mg/L	0.004 mg/L	99.3	70.0	130	----
		vanadium, total	7440-62-2	E420	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		zinc, total	7440-66-6	E420	0.383 mg/L	0.4 mg/L	95.8	70.0	130	----



Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 107773) - continued										
VA20B8682-001	Power House Springs	zirconium, total	7440-67-7	E420	0.0410 mg/L	0.04 mg/L	102	70.0	130	----
Total Metals (QCLot: 107774)										
VA20B8682-001	Power House Springs	chromium, total	7440-47-3	E420.Cr-L	0.0414 mg/L	0.04 mg/L	104	70.0	130	----
Total Metals (QCLot: 109047)										
VA20B8697-001	Anonymous	mercury, total	7439-97-6	E508	0.000105 mg/L	0.0001 mg/L	105	70.0	130	----
Aggregate Organics (QCLot: 106461)										
VA20B8515-001	Anonymous	chemical oxygen demand [COD]	----	E559	492 mg/L	500 mg/L	98.4	75.0	125	----
Aggregate Organics (QCLot: 109009)										
VA20B8682-001	Power House Springs	phenols, total (4AAP)	----	E562	0.0191 mg/L	0.02 mg/L	95.3	75.0	125	----
Volatile Organic Compounds [THMs] (QCLot: 108474)										
VA20B8682-003	Pemberton	bromodichloromethane	75-27-4	E611B	108 µg/L	100 µg/L	108	60.0	140	----
		bromoform	75-25-2	E611B	93.2 µg/L	100 µg/L	93.2	60.0	140	----
		chloroform	67-66-3	E611B	122 µg/L	100 µg/L	122	60.0	140	----
		dibromochloromethane	124-48-1	E611B	102 µg/L	100 µg/L	102	60.0	140	----
Haloacetic Acids (QCLot: 110768)										
KS2002271-001	Anonymous	bromochloroacetic acid	5589-96-8	E750	2.66 µg/L	2.5 µg/L	106	70.0	130	----
		dibromoacetic acid	631-64-1	E750	4.61 µg/L	5 µg/L	92.2	70.0	130	----
		dichloroacetic acid	79-43-6	E750	3.67 µg/L	5 µg/L	73.4	70.0	130	----
		monobromoacetic acid	79-08-3	E750	0.93 µg/L	1 µg/L	92.9	70.0	130	----
		monochloroacetic acid	79-11-8	E750	2.63 µg/L	2.5 µg/L	105	70.0	130	----
		trichloroacetic acid	76-03-9	E750	5.96 µg/L	5 µg/L	119	70.0	130	----

Qualifiers

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Appendix E - VCH Advice re Lead in Drinking Water



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.

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%20Facts_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