VILLAGE OF
ANMORE

2023 ANNUAL WATER QUALITY REPORT

Public Works Department
Village of Anmore
Prepared by: Scott Donaldson, Operations Superintendent

Foreword

Under the *British Columbia Drinking Water Protection Act* and the *British Columbia Drinking Water Protection Regulation* (BCDWPA & BCDWPR) the Village of Anmore is required to conduct water quality monitoring in the Village's distribution system and to publish the results in an annual report. This document fulfils that requirement by presenting a summary and discussion of all water quality sampling results for the year 2023. An overview of projects and events as they relate to drinking water in the Village of Anmore is also provided in this report.

Please visit the following web sites for further information:

Health Canada
http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php

Ministry of Health
http://www.health.gov.bc.ca/protect/dw_index.html

Health Link BC File #56 - Persons with compromised or Weakened Immune Systems
http://www.healthlinkbc.ca/healthfiles/hfile56.stm

Metro Vancouver
http://www.metrovancouver.org/services/water/Pages/default.aspx

Village of Anmore
http://www.anmore.com

USEPA
http://www.epa.gov/safewater/mcl.html

World Health Organization
http://www.who.int/water_sanitation_health/publications/2011/dwq_guidelines/en/index.html

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Acronyms

AO: Aesthetic Objective

ASTTBC: Applied Science Technicians and Technologists of British Columbia

BCDWPA: *British Columbia Drinking Water Protection Act*

BCDWPR: *British Columbia Drinking Water Protection Regulation*

DBP: Disinfection By-Products

DWMP: *Metro Vancouver Drinking Water Management Plan*

E.coli: *Escherichia coli*

EOCP: Environmental Operators Certification Program

GCDWQ: *Guidelines for Canadian Drinking Water Quality*

HAA: Haloacetic Acid

HPC: Heterotrophic Plate Count

MAC: Maximum Acceptable Concentration

Mg/l: Milligrams per Liter

NTU: Nephelometric Turbidity Units PPB: Parts Per Billion

PPM: Parts Per Million

PRV: Pressure Regulating Valve

PVC: Polyvinyl Chloride

SCADA: Supervisory Control and Data Acquisition

SCFP: Seymour – Capilano Filtration Plant

THM: Trihalomethane

UDF: Uni-directional Flushing

WQMRP: Water Quality Monitoring and Reporting Plan for Metro Vancouver and Member Municipalities

YTD: Year-to-Date

Executive Summary

The Village of Anmore supplies drinking water to residential and commercial customers within Village limits. The Village of Anmore provides safe, high quality, aesthetically pleasing drinking water at a reasonable cost.

The Village contracts the collection and testing of water samples to the Metro Vancouver Regional District, who collects the samples from the distribution system on a routine basis. This report includes a summary and discussion of the results of all sampling conducted on the Village 's water distribution system during 2023 as well as a discussion of projects and events affecting water quality within the Village of Anmore. A complete record of 2023 water quality sampling results can be found in the appendices of this report.

As per the Water Quality Monitoring and Reporting Plan for Metro Vancouver and Member Municipalities (WQMRP) water samples are collected from the distribution system and analysed for:

- Chemical and Physical Parameters
  - Metals
  - Vinyl chloride
  - Temperature
  - Free chlorine
  - Minerals
  - Disinfection by-products
  - Turbidity

- Bacterial Parameters
  - *E. Coli*
  - Heterotrophic Plate Count (HPC)
  - Total Coliforms

All sample results for *E.Coli and Total Coliforms* were negative. HPC's met the guidelines in all instances. Sample results for chemical and physical parameters addressed in the *Guidelines for Canadian Drinking Water Quality (GCDWQ)* were well under their respective Maximum Acceptable Concentration (MAC) values.

As part of our commitment to continual improvement, reliable service and high-water quality, the Village completes operational and capital projects as well as water quality sampling on an ongoing basis. In 2023 the Village completed routine inspections and maintenance of all water distribution facilities as well as dead end and un-directional water main flushing.

1.0 Water Distribution System Data

1.1 System Infrastructure

The tables in this section provide a snapshot of the Village of Anmore's water distribution system. All of the components listed, with the exception of the private hydrants, and private pump station are operated and maintained by the Village's Public Works Department.

Table #1: Length of Pipe in System

Total Length of all Pipes in Distribution System	26,000 meters

Table #2: Fire Hydrants

Fire Hydrants	**#**
Village Hydrants	154(approx.)
Private Hydrants	3
Total	**157(approx.)**

Table #3: Critical Water System Components

Asset	**#**
Pressure Reducing Valves	8
Pump Stations	3(1private)
Reservoirs	0
Chlorine Booster Stations	1

In addition to the pipe, fire hydrants, and critical components, there are many other smaller components to Anmore's water distribution system, including:

- Water meters
- Air valves
- End of line blow off valves
- Line valves
- Sampling stations

All these components work in concert to help the Village deliver safe, reliable drinking water to customers.

1.2 Public Response

In 2023 the Village's Public Works Department is pleased to report that there were no water quality complaints. This is due to the purchase of auto flushing units that are portable and allow staff to flush dead-end roads remotely, and periodic cL2 residual testing of dead end roads.

Current best management practices prescribed by Fraser Health, the *GCDWQ*, and the USEPA *Surface Water Treatment Rule* recommend maintaining a minimum of 0.20mg/l free chlorine in the distribution system (Health Canada, 2010) (Health Canada, 2009) (USEPA, 2004) (USEPA, 2002). The Village of Anmore aims to maintain free chlorine residual concentrations between 0.20 mg/l and 1.2 mg/l. If residents wish to remove chlorine from their water prior to drinking, the best way to do so is with an activated carbon filter, such as a Brita, or by filling a jug of water and letting it stand uncovered overnight.

Notification is provided to all residents by way of mail drop, email notification (for those registered) as well as postings on the Village's website, Facebook page and community sign boards regarding regularly scheduled annual water main flushing. It is recommended that if a resident finds discoloured water as a result of flushing, that the water is left running until it clears.

1.3 Staff Certification

The Village of Anmore water distribution system is classified as a Level II system by the Environmental Operators Certification Program (EOCP). The Village's water system is monitored, operated, and maintained by qualified personnel who are certified by the EOCP. In addition to certification under the EOCP, Village of Anmore staff have training in Hypo chlorination, PRV Maintenance and Hydrant Maintenance.

Table #4 contains a summary of staff qualifications.

Table #4: Operator Certification

Certification Level	# of Staff
EOCP Water Distribution Level I	1
EOCP Water Distribution Level II	1
Total Qualified Staff	**2**

2.0 2023 Event Summary

2.1 Planning for the Future

The Village of Anmore is a growing community within the Lower Mainland, with an estimated population of 2,356 residents (based on 2023 Census). Anmore's water system currently consists of 9 pressure zones, 2 pump stations, 1 Chlorination booster station, 8 pressure reducing stations, and includes over 25 km of water mains. Anmore receives potable water from the Metro Vancouver Coquitlam source via a 300 mm diameter supply connection from the City of Port Moody. The water supply and distribution infrastructure are a key focus of Anmore's strategic infrastructure priorities, and thus the need for Anmore to have a comprehensive Water Utility Master Plan (completed in 2015).

Anmore's 2015 Water Master Plan has provided an understanding of the capacity of its current system under existing and future demand requirements and identifies servicing opportunities and constraints to plan

upgrades to the water utility in an economic and efficient manner. A Capital Upgrades Plan was provided with a proposed schedule and estimated costs to complete the works. Integral to the Water Utility Master Plan is the development of a hydraulic model for Anmore, which will allow for the review of the level of services provided to existing and future populations by the water utility. Future populations are forecasted to a 2032 planning horizon in the most recent Official Community Plan (OCP). Furthermore, an annual operations, maintenance, and inspection program and budget will be developed which will allow for sufficient monitoring and maintenance of the water utility assets. The cumulative costs of the recommendations will form part of a long-term financial plan with the eventual goal of having a financially sustainable utility.

2.2 "Flush" Message from the Fraser Health Authority

Fraser Health has recently revised its metals at the tap "Flush" message. They have asked that all water purveyors include the following message in their annual report:

> *Anytime the water in a particular faucet has not been used for six hours or longer, "flush" your cold-water pipes by running the water until you notice a change in temperature. (This could take as little as five to thirty seconds if there has been recent heavy water use such as showering or toilet flushing. Otherwise, it could take two minutes or longer.)*
> *The more time water has been sitting in your home's pipes, the more lead it may contain.*
>
> *Use only water from the cold-tap for drinking, cooking, and especially making baby formula. Hot water is likely to contain higher levels of lead.*
>
> *The two actions recommended above are very important to the health of your family. They will probably be effective in reducing lead levels because most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.*
>
> *Conserving water is still important. Rather than just running the water down the drain you could use the water for things such as watering your plants* (Zubel, 2014).

If residents have any questions, they are encouraged to contact the Fraser Health's Drinking Water Program at 604-870-7900 or 1-866-749-7900.

3.0 Water Main Flushing Program

The Village of Anmore conducts uni-directional and dead-end flushing in order to maintain a high level of water quality in the distribution system. Regularly flushing water mains removes stagnant water and deposits from pipes. Spot flushing is also conducted on an "as required" basis due to complaints or poor water quality sample results indicating elevated Heterotrophic Plate Counts (HPC), positive total coliform results, and/or elevated water temperature combined with depressed free chlorine residuals.

4.0 Water Quality Sampling and Testing

As per the *Water Quality Monitoring and Reporting Plan for Metro Vancouver and Member Municipalities (WQMRP)* sampling and analysis for numerous water quality parameters are conducted on the Village of Anmore's distribution system on a regular basis. Sample schedules for various constituents are broken into sections based on the number of samples recommended by the *GCDWQ* and/or mandated by the *BCDWPR*. Monitoring of drinking water in the Village's water distribution system is conducted for bacterial, chemical, and physical characteristics.

In 2023 a total of 53 bacteriological samples were collected from the Village's distribution system. Table #6 presents the locations and descriptions for the four sample stations where Metro Vancouver staff collect water quality samples on a bi-weekly basis.

Table #6: Water Sampling Station Inventory

SAMPLE STATION	LOCATION	SOURCE WATER
ANM-474	1009 Ravenswood Dr.	Coquitlam (Via Port Moody)
ANM-471	1175 East Rd.	Coquitlam (Via Port Moody)
ANM-472	3007 Sunnyside Rd.	Coquitlam (Via Port Moody)
ANM-473	76 Elementary Rd.	Coquitlam (Via Port Moody)

4.1 Chemical / Physical Quality

Water quality sampling for chemical and physical parameters including disinfection by-products, vinyl chloride, and metals is carried out on varying schedules. Table #7 modified from Metro Vancouver's *WQMRP* sets out a schedule requiring "approximately 10% of the sample sites in each municipal system to be sampled for the following parameters at the frequency shown (Metro Vancouver, 2008)."

Table #7: Chemical / Physical Monitoring in Municipal Distribution Systems

Parameter	Location	Frequency
Free Chlorine Residual	All	Tests run when bacteriological samples are taken
Copper	Municipal Distribution System**	Semi-annually
Haloacetic Acids	Municipal Sites – Cross section, representative of all three sources, minimum of one per municipality.	Quarterly
Iron	Representative municipal sites – unlined iron and steel mains.	Semi-annually
Lead	Municipal Distribution System**	Semi-annually
Odour	Any or all sites	Complaint Basis*
pH	Municipal Sites – cross section, representative of all sources, minimum of three per municipality.	Quarterly
Taste	Any or all sites.	Complaint Basis*
Temperature	Representative municipal sites.	Quarterly
Trihalomethanes	Municipal Sites – cross section, representative of all sources, minimum of three per municipality.	Quarterly
Turbidity	Municipal Sites – All	Collected with bacteriological samples
Vinyl Chloride	Municipal sites where PVC pipe is used in the distribution system – minimum of one per potentially affected system.	Semi-annually
Zinc	Municipal Distribution System**	Semi-annually

* If a complaint comes to Metro Vancouver, Metro Vancouver will bring it to the attention of the relevant municipality.

** The GCDWQ stipulate that samples for metals analysis should be from a flushed location. This provides rationale to sample for metals in the distribution system as opposed to locations in buildings.

4.1.1 Metals 7

Metals can enter the drinking water system from either the source watershed or in the distribution system itself. Historically the Village of Anmore's drinking water has contained very little metal compounds. The Village of Anmore monitors the water distribution system for metals. Sampling is conducted semi-annually as per the *WQMRP*.

A summary of relevant health-based MAC and Aesthetic Objective (AO) standards for metals in drinking water can be found in Table #8. This table summarizes only those parameters listed in the *GCDWQ* that are captured by the current version of the *WQMRP*.

A complete record of 2023 metals sampling results can be found in Appendix #2.

Table #8: MAC and AO Metals Standards Modified from the Guidelines for Canadian Drinking Water Quality

Parameter	MAC (mg/l)	AO (mg/l)	Year of Approval (Re-affirmation)
Aluminium		[0.1 / 0.2]	1998
Antimony	0.006		1997
Arsenic	0.010		2006
Barium	1.0		1990
Cadmium	0.005		1986 (2005)
Chromium	0.05		1986
Copper		≤1.0	1992
Iron		≤0.3	1978 (2005)
Lead	0.010		1992
Manganese		≤0.05	1987
Mercury	0.001		1986
Selenium	0.01		1992
Sodium		≤200	1992
Zinc		≤5.0	1979 (2005)

4.1.2 Disinfection By-Products

Disinfection By-Product (DBP) formation occurs when chlorine in drinking water reacts with dissolved organic compounds. These reactions can produce two main groups of DBP compounds, Trihalomethanes (THM) and Halo acetic Acid (HAA). Monitoring for DBP's is conducted on a quarterly basis as set out by Metro Vancouver's *WQMRP*. 2023 THM and HAA sampling results from the Village's water distribution system were below the respective guideline limits.

A complete record of 2023 DBP sampling results can be found in Appendix #3.

4.2 Bacteriological Quality

All bacterial samples collected from municipal distribution systems are analysed for total coliform and *E. coli* bacteria. These samples are also analysed for the presence of heterotrophic bacteria. HPC bacteria provide an indicator of microbial growth in the distribution system and are used as an early warning to predict where water quality concerns may arise. The Village collects a minimum of 8 bacteriological samples per month. Further samples are collected by Village personnel on an as needed basis in response to water main breaks, operational adjustments, water quality complaints, or where cross-connections are suspected.

The quantity of bacterial samples collected from municipal water distribution systems is based on the population served. Under the *BCDWPR* the Village is required to collect a minimum of 4 bacteriological samples from the water distribution system per month based on population (under 5000). Figures #1 and #2 display the number of bacteriological samples collected from the Village 's water distribution system and the percentage of samples collected that returned HPC results greater than 500 CFU/ml each month. It should be noted that the statistical analysis of a small number of samples per month is subject to skewing of results due to the limited number of samples. For example, if less than 10 samples were submitted in a month and one sample was positive, the percentage of samples containing coliforms would

exceed the standard of 10%.

A complete record of 2023 bacteriological water quality sampling results can be found in Appendix #1. The Village of Anmore's results were all within regulatory limits for 2023.

Figure #1: Number of Bacterial Samples Analysed / Month

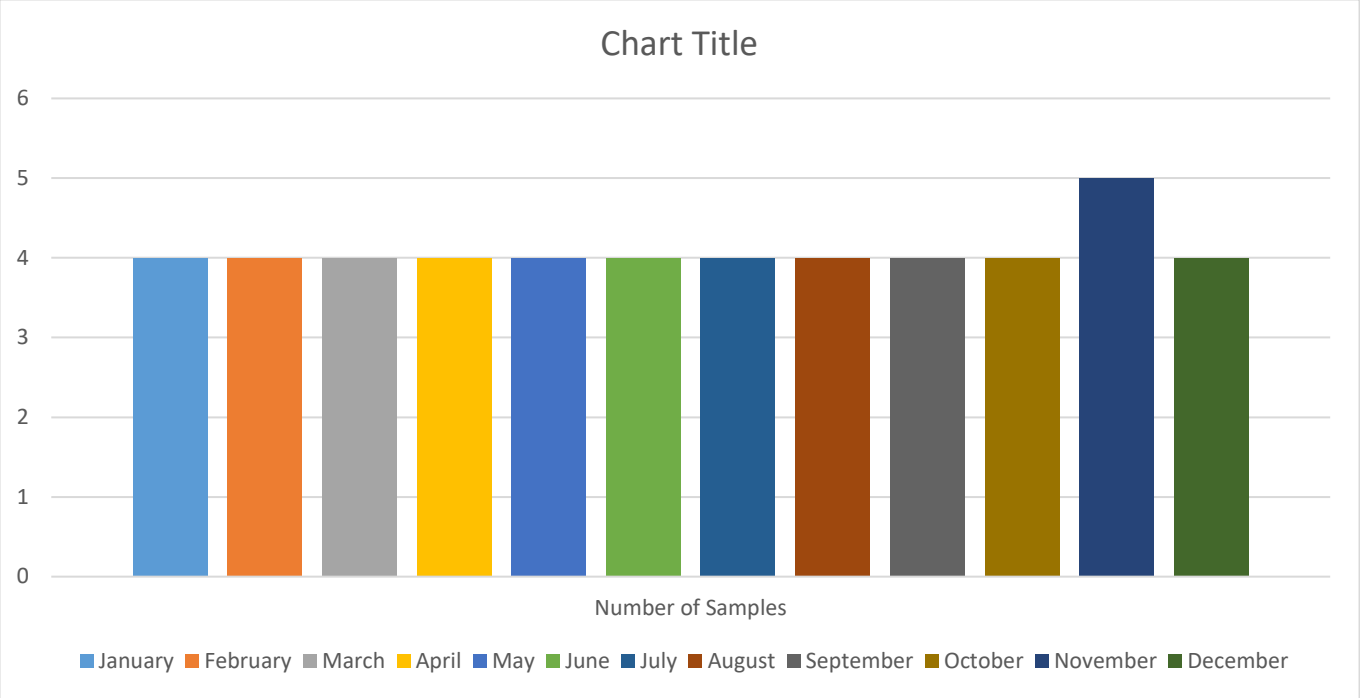


Figure #2: 2023 Monthly Heterotrophic Plate Count

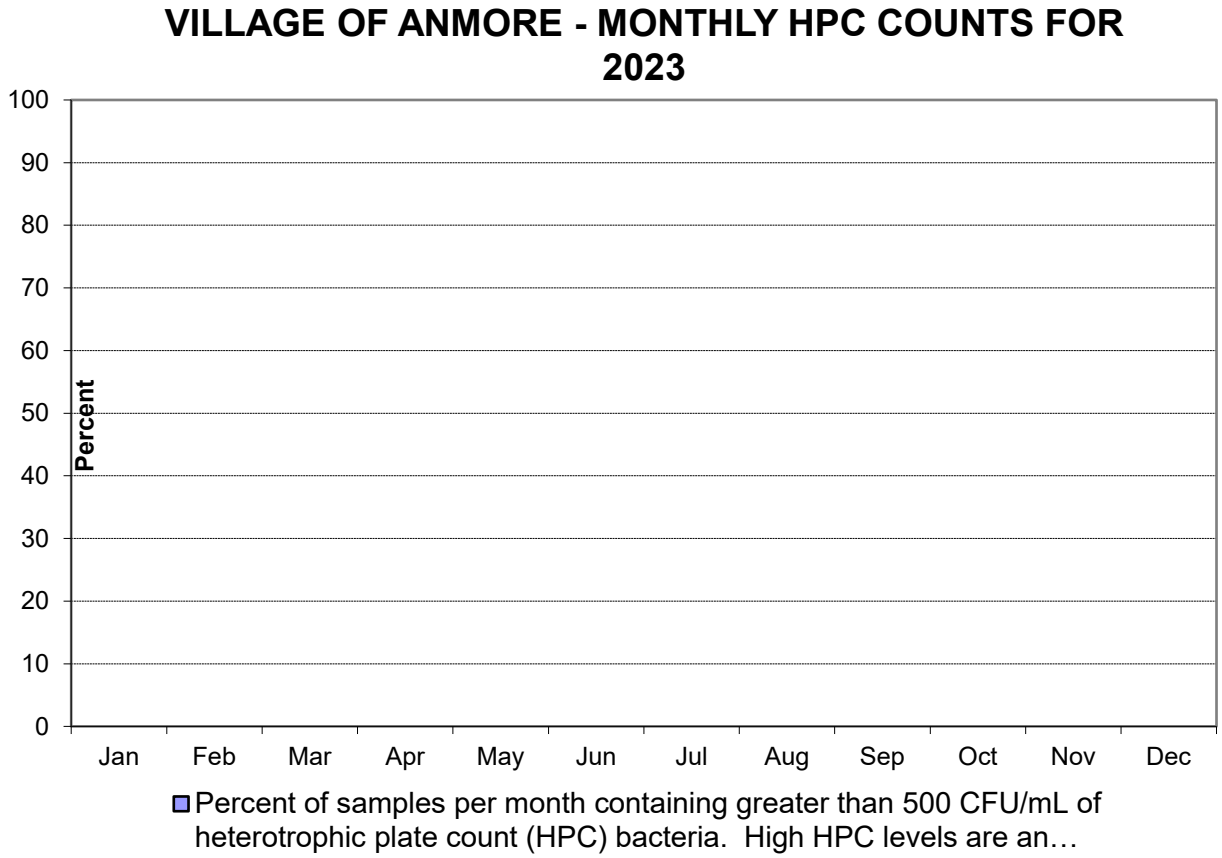
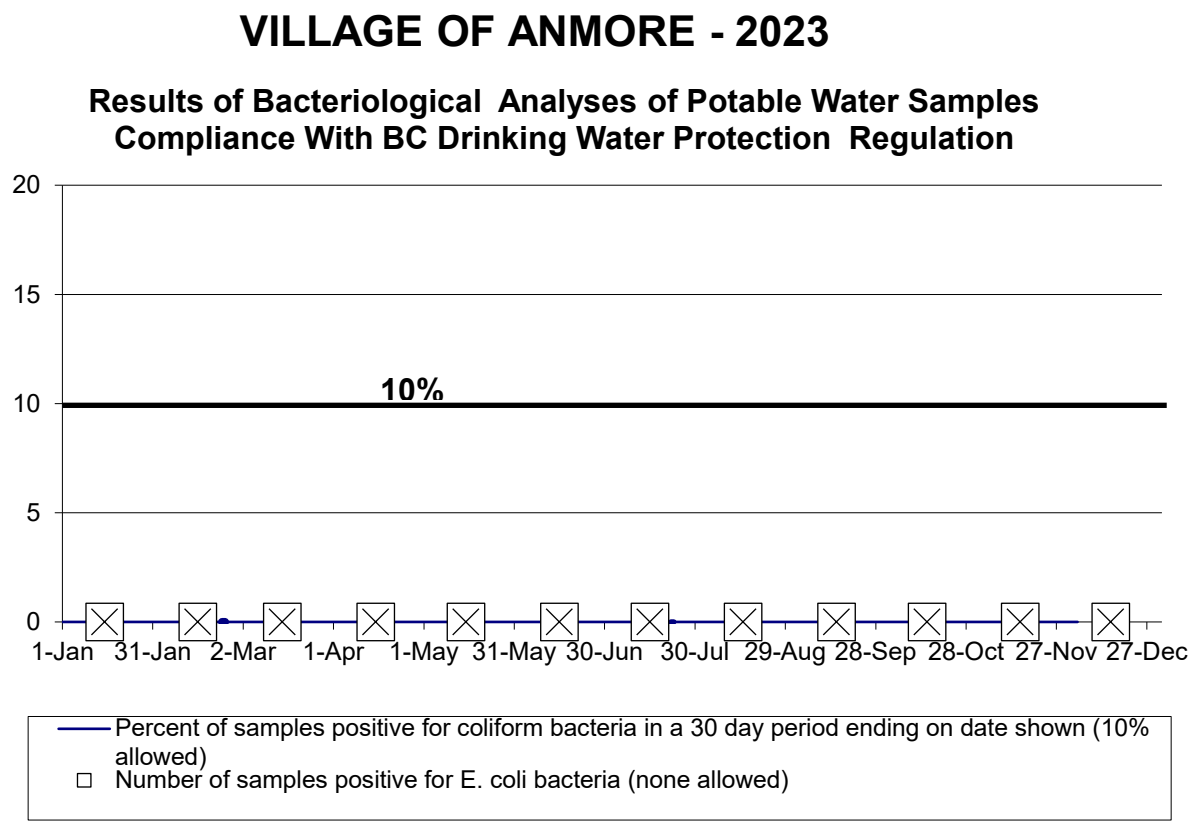


Figure #3: Results of Bacteriological Analysis of Potable Water Samples and Compliance with BCDWPR



Tables #9 and #10, which are modified from Schedule A and B of the *BCDWP*, define bacteriological water quality monitoring requirements for all water purveyors under the act and regulation.

Table #9: Water Quality Standards for Potable Water (Sections 2 & 9)

Parameter:	**Standard:**
Fecal coliform bacteria	No detectable fecal coliform bacteria per 100ml
Escherichia coli	No detectable Escherichia coli 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 100ml and no sample has more than 10 total coliform bacteria per 100ml

(Province of British Columbia, 2011)

Table #10: Frequency of Monitoring Samples for Prescribed Water Supply Systems *(Section 8)*

Population Served by the Prescribed Water Supply System:	Number of Samples Per Month:
less than 5,000	4
5,000 to 90,000	1 per 1,000 of population
more than 90,000	90 plus 1 per 10,000 of population in excess of 90,000

(Province of British Columbia, 2011)

4.3 Free Residual Chlorine

Water distributed by the Village contains a disinfectant called free chlorine. Maintaining an adequate disinfectant residual in a potable water distribution system is vital to preserving public health. Disinfectant in the distribution system:

- Ensures that microorganisms hazardous to public health are inactivated.
- Provides an indicator of distribution system upset.
- Controls biofilm growth

(USEPA, 2007)

Free residual chlorine concentrations in water received by the Village from Port Moody generally varies and is not at concentrations high enough to provide adequate disinfection throughout the Village. Reduced concentrations of disinfectant have historically been a challenge for the Village's water system. Prior to the commissioning of the permanent Chlorine Booster Station in December of 2013, Anmore's Water System had little to no chlorine residual.

Tables #11, #12 and Figure #4 provide a summary of the number of samples collected from each sample station that were found to have free chlorine concentrations less than 0.20 mg/l. A map of all water quality sample collection points regularly sampled by the Village can be found in Appendix #4.

Table #11: Percentage of Samples / Month with < 0.20 mg/l Free Chlorine

Month	# of Free Cl2 Samples <0.20 mg/l	Total Number of Samples Taken	Percentage of Samples / Month With Less Than 0.20 mg/l Free Cl2
January	0	4	0%
February	0	4	0%
March	0	4	0%
April	0	4	0%
May	0	4	0%
June	0	4	0%
July	0	4	0%
August	0	4	0%
September	0	4	0%

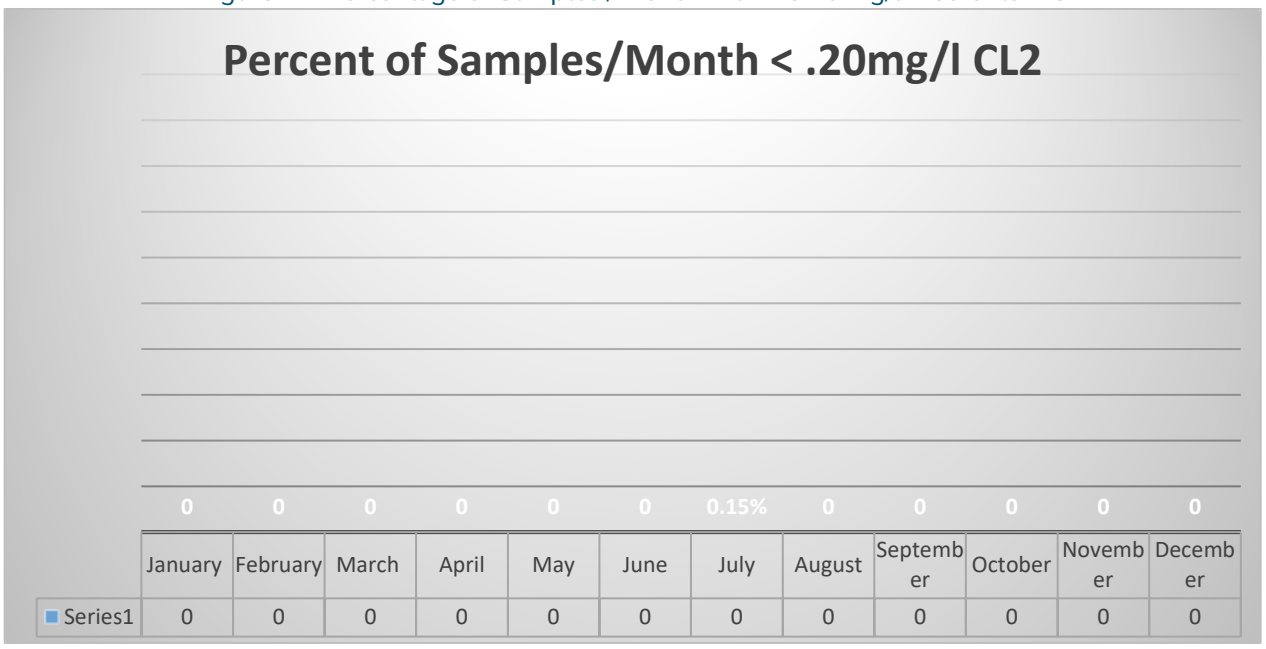
October	0	4	0%
November	0	5	0%
December	0	4	0%
Total	**5**	**49**	**0%**

Table #12: Summary of Chlorine Residual Sampling by Station

Sample Station	Total Number of Samples with <0.2 mg/l Free Chlorine	Total Number of Samples per Station	Percentage of Samples with <0.2 mg/l Free Chlorine
ANM-471	0	12	0%
ANM-472	0	12	0%
ANM-473	0	13	0%
ANM-474	0	12	0%
All Stations	**0**	**49**	**0%**

See Appendix #4 for Sampling Station Map

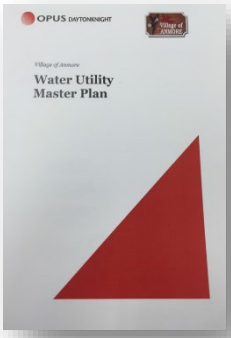
Figure #4: Percentage of Samples / Month with < 0.20 mg/l Free Chlorine



5.0 Water Distribution System Projects

5.1 Future Planning

In the spring of 2015, the Village completed a comprehensive study of the water utility. The intent of this study work was to develop a Water Utility Master Plan that will guide the operation, maintenance, upgrading and expansion and renewal of the utility in a sustainable manner. This Plan has established the existing infrastructure assets, assessed the condition of the assets, and identified any deficiencies that affect the immediate and long-term function of these assets. The data gathered through these processes will be utilized to establish common maintenance/operating practices, future capital improvements and assist with updating strategic priorities as relates to water utility infrastructure planning.



5.2 Emergency Response Plan

In the event of an emergency, the Village may enact its Water System Emergency Response Plan. The goals of this plan are as follows:

- Rapidly restore service after an emergency.
- Ensure adequate water supply for fire protection.
- Minimize loss of service to users.
- Provide emergency information to public.
- Re-establish critical operations.

Conclusion

This year (2023) Public Works staff at the Village of Anmore have continued improvements to the day-to-day operations of the water utility and continue to work closely with Fraser Health Authority to ensure safe, clean potable water for the Village's residents.

Every year the Village budgets for the study, maintenance, and replacement of critical components of the water distribution system and 2023 was no exception. Continued resource focus on the operation and maintenance of the Village's water system along with completing critical infrastructure upgrades will be pivotal to maintaining a high level of drinking water quality in the coming years.

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Appendix #1

Bacterial Analysis

Sample Type	Sample Name	Sampled Date	Chlorine Free	Total Coliform	Ecoli	Turbidity	Temp	Ecoli	Total Coliform	HPC
			mg/L	MPN/ 100mLs	MPN/ 100mLs	NTU	°C	CFU/ 100mLs	CFU/ 100mLs	CFU/mL
GRAB	ANM-471	2023-01-27 11:49	0.87	-	-	0.59	6	<1	<1	<2
GRAB	ANM-471	2023-02-10 12:05	0.41	-	-	0.47	6	<1	<1	12
GRAB	ANM-471	2023-03-03 09:39	0.57	-	-	0.3	5	<1	<1	<2
GRAB	ANM-471	2023-04-27 07:27	0.47	-	-	0.43	7.6	<1	<1	<2
GRAB	ANM-471	2023-05-25 08:58	0.64	-	-	0.31	13.1	<1	<1	<2
GRAB	ANM-471	2023-06-06 11:41	0.73	-	-	0.48	12.4	<1	<1	<2
GRAB	ANM-471	2023-07-13 10:45	0.93	-	-	0.39	15.9	<1	<1	<2
GRAB	ANM-471	2023-08-10 09:14	0.94	-	-	0.29	16.5	<1	<1	<2
GRAB	ANM-471	2023-09-09 11:33	0.98	-	-	0.36	17.9	<1	<1	<2
GRAB	ANM-471	2023-10-04 10:27	0.57	<1	<1	0.41	15	-	-	<2
GRAB	ANM-471	2023-11-22 09:56	0.53	-	-	0.32	9.8	<1	<1	<2
GRAB	ANM-471	2023-12-02 09:59	0.54	-	-	0.27	8.4	<1	<1	<2
GRAB	ANM-472	2023-01-27 09:38	1.01	-	-	0.35	7	<1	<1	<2
GRAB	ANM-472	2023-02-10 11:50	0.6	-	-	0.34	6	<1	<1	<2
GRAB	ANM-472	2023-03-03 09:22	0.85	-	-	0.32	5	<1	<1	<2
GRAB	ANM-472	2023-04-27 07:09	0.76	-	-	0.41	7.8	<1	<1	<2
GRAB	ANM-472	2023-05-25 08:45	0.59	-	-	0.41	12.2	<1	<1	<2
GRAB	ANM-472	2023-06-06 11:50	1.2	-	-	0.28	13.4	<1	<1	<2
GRAB	ANM-472	2023-07-13 10:35	1.04	-	-	0.25	16.5	<1	<1	44
GRAB	ANM-472	2023-08-10 09:03	0.71	-	-	0.32	17.9	<1	<1	<2
GRAB	ANM-472	2023-09-09 11:17	0.79	-	-	0.43	17.9	<1	<1	<2
GRAB	ANM-472	2023-10-04 10:15	0.87	<1	<1	0.39	15	-	-	4
GRAB	ANM-472	2023-11-22 10:12	0.83	-	-	0.34	9.7	<1	<1	<2
GRAB	ANM-472	2023-12-02 11:38	0.63	-	-	0.26	8.2	<1	<1	2
GRAB	ANM-473	2023-01-27 10:03	0.66	-	-	0.23	7	<1	<1	<2
GRAB	ANM-473	2023-02-10 11:21	0.73	-	-	0.42	6	<1	<1	<2
GRAB	ANM-473	2023-03-03 09:52	0.71	-	-	0.26	5.1	<1	<1	<2
GRAB	ANM-473	2023-04-27 06:52	0.58	-	-	0.44	7.5	<1	<1	<2
GRAB	ANM-473	2023-05-25 08:23	0.47	-	-	0.3	12.9	<1	<1	2
GRAB	ANM-473	2023-06-06 12:07	0.77	-	-	0.27	13.5	<1	<1	2
GRAB	ANM-473	2023-07-13 10:19	0.55	-	-	0.31	15.9	<1	<1	60
GRAB	ANM-473	2023-08-10 08:46	0.67	-	-	0.27	17.3	<1	<1	16
GRAB	ANM-473	2023-09-09 10:48	0.49	-	-	0.22	16.8	<1	<1	2
GRAB	ANM-473	2023-10-04 10:00	0.27	<1	<1	0.49	15	-	-	<2
GRAB	ANM-473	2023-11-08 10:24	0.27	-	-	0.36	11.9	<1	<1	8
GRAB	ANM-473	2023-11-22 10:25	0.63	-	-	0.23	10.3	<1	<1	16
GRAB	ANM-473	2023-12-02 12:00	0.6	-	-	0.3	8.2	<1	<1	2
GRAB	ANM-474	2023-01-27 09:47	0.94	-	-	0.33	6.5	<1	<1	<2
GRAB	ANM-474	2023-02-10 11:38	0.6	-	-	0.35	5.9	<1	<1	<2
GRAB	ANM-474	2023-03-03 09:10	0.72	-	-	0.31	4.7	<1	<1	<2
GRAB	ANM-474	2023-04-29 07:08	0.79	-	-	0.44	8.4	<1	<1	<2
GRAB	ANM-474	2023-05-25 08:33	0.57	-	-	0.39	12	<1	<1	2
GRAB	ANM-474	2023-06-06 11:59	0.29	-	-	0.46	14.4	<1	<1	<2
GRAB	ANM-474	2023-07-13 10:28	0.82	-	-	0.67	14.9	<1	<1	6
GRAB	ANM-474	2023-08-10 08:55	0.89	-	-	0.23	17.7	<1	<1	<2
GRAB	ANM-474	2023-09-09 11:04	0.87	-	-	0.9	18	<1	<1	26
GRAB	ANM-474	2023-10-04 10:43	0.49	<1	<1	0.35	15	-	-	<2
GRAB	ANM-474	2023-11-22 10:19	0.7	-	-	0.26	9.7	<1	<1	<2
GRAB	ANM-474	2023-12-02 11:49	0.63	-	-	0.33	7.9	<1	<1	2

Appendix #2
Metals Monitoring

metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

Liquid Waste Services
Environmental Management & Quality Control
Chemistry Lab
1299 Derwent Way, Delta BC V3M 5V9
Phone: (604) 523-7173 Fax: (604) 525-0932

Customer:	**Village of Anmore**
Title:	Municipal Metals Apr-23/24
Project Number:	231623
Project Date:	23-Apr-2024
Project Status:	Authorized by DMULZET
Project Notes:	

Analysis	Units	ANM-472	ANM-474
		3007 Sunnyside Road	1009 Ravenswood Drive
		2024-04-24 10:23	2024-04-24 10:55
		GRAB	GRAB
Aluminum Total	µg/L	92	92
Antimony Total	µg/L	<0.5	<0.5
Arsenic Total	µg/L	<0.5	<0.5
Barium Total	µg/L	2.5	2.3
Boron Total	µg/L	<10	<10
Cadmium Total	µg/L	<0.2	<0.2
Calcium Total	µg/L	1290	1290
Chromium Total	µg/L	<0.05	0.05
Cobalt Total	µg/L	<0.5	<0.5
Copper Total	µg/L	7.2	6.8
Iron Total	µg/L	57	58
Lead Total	µg/L	<0.5	<0.5
Magnesium Total	µg/L	93	93
Manganese Total	µg/L	7.8	7.8
Mercury Total	µg/L	<0.05	<0.05
Molybdenum Total	µg/L	<0.5	<0.5
Nickel Total	µg/L	<0.5	<0.5
Potassium Total	µg/L	126	125
Selenium Total	µg/L	<0.5	<0.5
Silver Total	µg/L	<0.5	<0.5
Sodium Total	µg/L	12000	12000
Zinc Total	µg/L	<3.0	<3.0

metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

Liquid Waste Services
Environmental Management & Quality Control
Chemistry Lab
1299 Derwent Way, Delta BC V3M 5V9
Phone: (604) 523-7173 Fax: (604) 525-0932

Customer:	**Village of Anmore**
Title:	Municipal Metals Sep-11/23
Project Number:	226669
Project Date:	11-Sep-2023
Project Status:	Authorized by TEWONG
Project Notes:	

Analysis	Units	ANM-472	ANM-474
		3007 Sunnyside Road	1009 Ravenswood Drive
		2023-09-13 10:28	2023-09-13 10:38
		GRAB	GRAB
Aluminum Total	µg/L	58	58
Antimony Total	µg/L	<0.5	<0.5
Arsenic Total	µg/L	<0.5	<0.5
Barium Total	µg/L	2.8	2.7
Boron Total	µg/L	<10	<10
Cadmium Total	µg/L	<0.2	<0.2
Calcium Total	µg/L	1410	1400
Chromium Total	µg/L	0.05	0.05
Cobalt Total	µg/L	<0.5	<0.5
Copper Total	µg/L	2.9	2.4
Iron Total	µg/L	58	56
Lead Total	µg/L	<0.5	<0.5
Magnesium Total	µg/L	86	87
Manganese Total	µg/L	3.2	3.1
Mercury Total	µg/L	<0.05	<0.05
Molybdenum Total	µg/L	<0.5	<0.5
Nickel Total	µg/L	<0.5	<0.5
Potassium Total	µg/L	143	145
Selenium Total	µg/L	<0.5	<0.5
Silver Total	µg/L	<0.5	<0.5
Sodium Total	µg/L	10400	10500
Zinc Total	µg/L	<3.0	<3.0

Appendix #3

Disinfection By-Product Monitoring

Sample	Date Sampled	THM (ppb)						HAA (ppb)						
		Bromodichloromethane	Bromoform	Chlorodibromomethane	Chloroform	Total Trihalomethanes	Total THM Quarterly Average (Guideline Limit 100 ppb)	Dibromoacetic Acid	Dichloroacetic Acid	Monobromoacetic Acid	Monochloroacetic Acid	Trichloroacetic Acid	Total Haloacetic Acid	Total HAA Quarterly Average (Guideline Limit 80 ppb)
ANM-470	29-May-18	<1	<1	<1	33	35		0.6	22	<1	2	30	55	
ANM-470	8-Aug-18	<1	<1	<1	29	30		<0.5	16	<1	3	20	39	
ANM-470	21-Nov-18	<1	<1	<1	58	59		<0.5	19	<1	2	35	58	
ANM-470	19-Mar-19	1	<1	<1	46	49	43	<0.5	25	2	2	37	67	55
ANM-470	15-May-19	1	<1	<1	43	45	46	<0.5	23	<1	3	38	64	57
ANM-470	22-Aug-19	1	<1	<1	55	57	53	<0.5	48	<1	9	16	72	65
ANM-470	6-Dec-19	1	<1	<1	52	54	51	<0.5	12	<1	<2	29	42	61
ANM-470	28-Feb-20	1	<1	<1	62	64	55	<0.5	14	<1	3	11	29	52
ANM-470	28-May-20	1	<1	<1	41	43	55	<0.5	21	<1	3	30	54	49
ANM-473	25-Feb-20	<1	<1	<1	40	42	49	<0.5	10	<1	<2	24	35	41
ANM-473	11-Aug-20	1	<1	<1	75	77	56	<0.5	17	<1	<2	46	64	41
ANM-473	3-Dec-20	<1	<1	<1	58	59	60	<0.5	13	<1	3	<0.5	17	40
ANM-473	25-Feb-21	<1	<1	<1	51	52	58	<0.5	10	<1	4	29	44	40
ANM-473	2-Jun-21	1	<1	<1	42	45	58	<0.5	12	<1	<2	43	56	45
ANM-473	25-Aug-21	2	<1	<1	71	74	58	<0.5	2	<1	<2	27	30	37
ANM-473	25-Nov-21	1	<1	<1	46	47	55	<0.5	2	<1	<2	48	50	45
ANM-473	17-Feb-22	1	<1	<1	46	48	54	<0.5	22	<0.5	1	36	59	49
ANM-474	02-Jun-20	1	<1	<1	49	52		<0.5	15	<1	<2	26	41	
ANM-474	11-Aug-20	1	<2	<2	43	45		<0.5	16	1	<2	30	48	
ANM-474	3-Dec-20	<1	<1	<1	51	52		<0.5	26	<1	4	50	80	
ANM-474	25-Feb-21	<1	<1	<1	35	37	47	<0.5	12	<1	5	18	36	51
ANM-474	2-Jun-21	1	<1	<1	33	35	42	<0.5	15	<1	2	32	49	53
ANM-474	25-Aug-21	2	<1	<1	45	48	43	<0.5	5	2	<2	24	31	49
ANM-474	25-Nov-21	<1	<1	<1	41	42	40	<0.5	7	<1	<2	32	39	39
ANM-474	17-Feb-22	1	<1	<1	38	40	41	<0.5	21	<0.5	<0.5	31	52	43

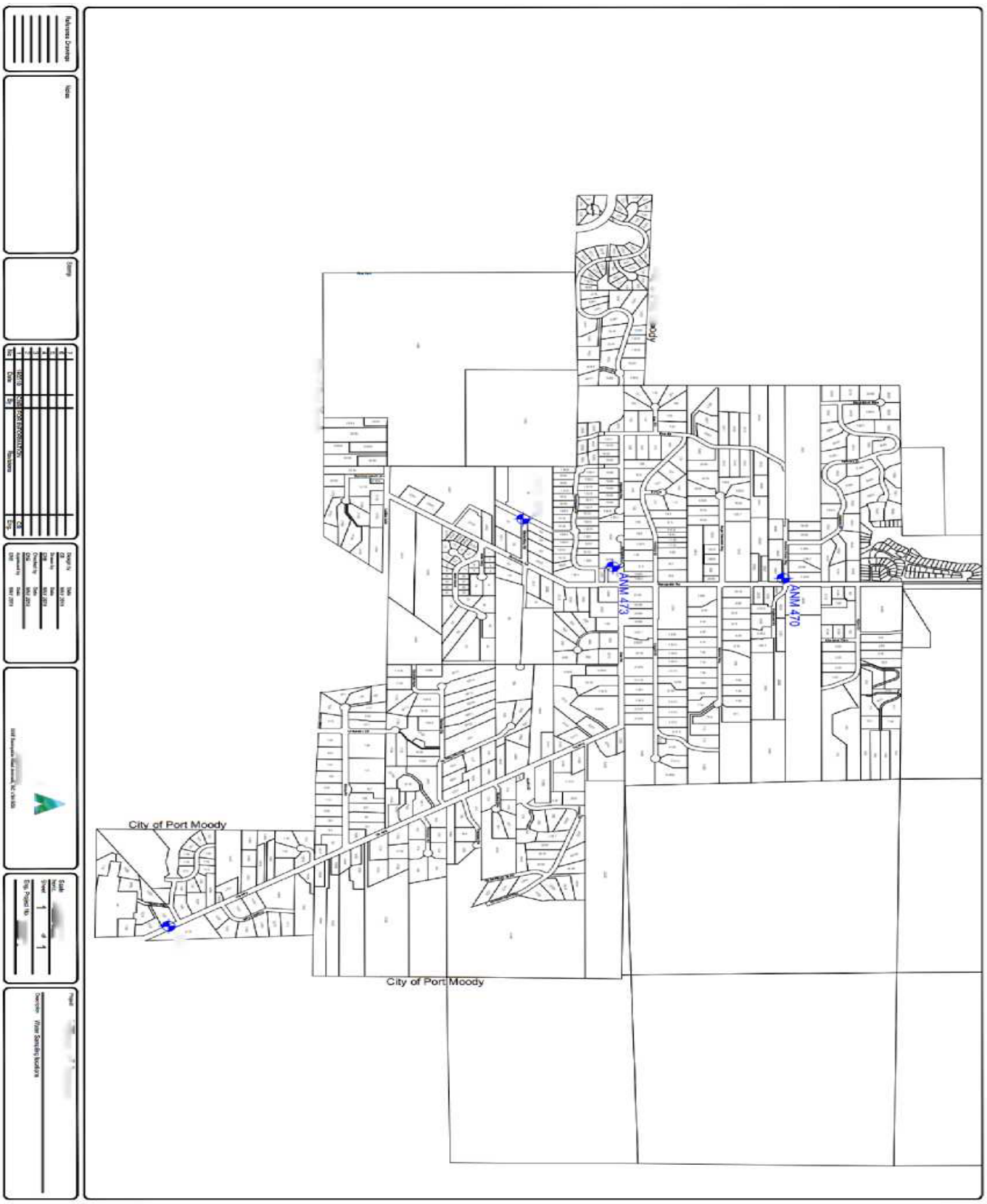
Sample	Date Sampled	THM (ppb)						HAA (ppb)						
		Bromodichloromethane	Bromoform	Chlorodibromomethane	Chloroform	Total Trihalomethanes	Total THM Quarterly Average (Guideline Limit 100 ppb)	Dibromoacetic Acid	Dichloroacetic Acid	Monobromoacetic Acid	Monochloroacetic Acid	Trichloroacetic Acid	Total Haloacetic Acid	Total HAA Quarterly Average (Guideline Limit 80 ppb)
ANM-473	30-May-23	1	<1	<1	34	37	54	<0.5	7	<0.5	<0.5	19	26	34
ANM-473	29-Aug-23	2	<1	<1	41	44	51	<0.5	8	<0.5	<0.5	21	29	31
ANM-473	30-Nov-23	1	<1	<1	36	37	49	<0.5	5	<0.5	<0.5	35	30	32
ANM-473	31-Jan-24	<1	<1	<1	41	42	39	<0.5	11	<0.5	<0.5	47	58	28
ANM-473	24-Apr-24	1	<1	<1	44	45	41	<0.5	8.3	<0.5	<0.5	35	43	30
ANM-474	30-May-23	1	<1	<1	32	35	47	<0.5	6	<0.5	<0.5	18	24	30
ANM-474	29-Aug-23	1	<1	<1	34	36	49	<0.5	11	<0.5	<0.5	22	32	27
ANM-474	30-Nov-23	1	<1	<1	41	43	46	<0.5	3	<0.5	<0.5	36	33	30
ANM-474	31-Jan-24	<1	<1	<1	31	31	38	<0.5	14	<0.5	<0.5	33	47	30
ANM-474	24-Apr-24	1	<1	<1	42	43	40	<0.5	8.9	<0.5	<0.5	37	46	33

Sample	Date Sampled	THM (ppb)						HAA (ppb)						
		Bromodichloromethane	Bromoform	Chlorodibromomethane	Chloroform	Total Trihalomethanes	**Total THM Quarterly Average (Guideline Limit 100 ppb)**	Dibromoacetic Acid	Dichloroacetic Acid	Monobromoacetic Acid	Monochloroacetic Acid	Trichloroacetic Acid	Total Haloacetic Acid	**Total HAA Quarterly Average (Guideline Limit 80 ppb)**
ANM-470	29-May-18	<1	<1	<1	33	35		0.6	22	<1	2	30	55	
ANM-470	8-Aug-18	<1	<1	<1	29	30		<0.5	16	<1	3	20	39	
ANM-470	21-Nov-18	<1	<1	<1	58	59		<0.5	19	<1	2	35	58	
ANM-470	19-Mar-19	1	<1	<1	46	49	43	<0.5	25	2	2	37	67	55
ANM-470	15-May-19	1	<1	<1	43	45	46	<0.5	23	<1	3	38	64	57
ANM-470	22-Aug-19	1	<1	<1	55	57	53	<0.5	48	<1	9	16	72	65
ANM-470	6-Dec-19	1	<1	<1	52	54	51	<0.5	12	<1	<2	29	42	61
ANM-470	28-Feb-20	1	<1	<1	62	64	55	<0.5	14	<1	3	11	29	52
ANM-470	28-May-20	1	<1	<1	41	43	55	<0.5	21	<1	3	30	54	49
ANM-473	17-Feb-22	1	<1	<1	46	48	54	<0.5	22	<0.5	1	36	59	49
ANM-473	12-May-22	1	<1	<1	53	55	56	<0.5	19	<0.5	1.7	42	63	51
ANM-473	25-Aug-22	<1	<1	<1	63	63	53	<0.5	14	<0.5	1.4	30	45	54
ANM-473	17-Nov-22	2	<1	<1	46	48	54	<0.5	0.6	<0.5	<0.5	23	24	48
ANM-473	10-Feb-23	1	<1	<1	66	67	58	<0.5	9	<0.5	1.5	31	42	44
ANM-473	30-May-23	1	<1	<1	34	37	54	<0.5	6.8	<0.5	<0.5	19	26	34
ANM-473	29-Aug-23	2	<1	<1	41	44	51	<0.5	8.2	<0.5	<0.5	21	29	31
ANM-474	17-Feb-22	1	<1	<1	38	40	41	<0.5	21	<0.5	<0.5	31	52	43
ANM-474	12-May-22	1	<1	<1	43	45	44	<0.5	23	<0.5	1.8	39	63	46
ANM-474	25-Aug-22	<1	<1	<1	41	41	42	<0.5	11	<0.5	1.4	28	40	49
ANM-474	17-Nov-22	2	<1	<1	42	45	43	<0.5	2.5	<0.5	<0.5	20	23	45
ANM-474	10-Feb-23	1	<1	<1	66	67	50	<0.5	7.9	<0.5	<0.5	27	34	40
ANM-474	30-May-23	1	<1	<1	32	35	47	<0.5	6	<0.5	<0.5	18	24	30
ANM-474	29-Aug-23	1	<1	<1	34	36	49	<0.5	11	<0.5	<0.5	22	32	27

Sample	Date Sampled	THM (ppb)						HAA (ppb)						
		Bromodichloromethane	Bromoform	Chlorodibromomethane	Chloroform	Total Trihalomethanes	**Total THM Quarterly Average (Guideline Limit 100 ppb)**	Dibromoacetic Acid	Dichloroacetic Acid	Monobromoacetic Acid	Monochloroacetic Acid	Trichloroacetic Acid	Total Haloacetic Acid	**Total HAA Quarterly Average (Guideline Limit 80 ppb)**
ANM-473	17-Nov-22	2	<1	<1	46	48	54	<0.5	0.6	<0.5	<0.5	23	24	48
ANM-473	10-Feb-23	1	<1	<1	66	67	58	<0.5	9	<0.5	1.5	31	42	44
ANM-473	30-May-23	1	<1	<1	34	37	54	<0.5	6.8	<0.5	<0.5	19	26	34
ANM-473	29-Aug-23	2	<1	<1	41	44	51	<0.5	8.2	<0.5	<0.5	21	29	31
ANM-473	30-Nov-23	1	<1	<1	36	37	49	<0.5	5.1	<0.5	<0.5	35	30	32
ANM-474	17-Nov-22	2	<1	<1	42	45	43	<0.5	2.5	<0.5	<0.5	20	23	45
ANM-474	10-Feb-23	1	<1	<1	66	67	50	<0.5	7.9	<0.5	<0.5	27	34	40
ANM-474	30-May-23	1	<1	<1	32	35	47	<0.5	6	<0.5	<0.5	18	24	30
ANM-474	29-Aug-23	1	<1	<1	34	36	49	<0.5	11	<0.5	<0.5	22	32	27
ANM-474	30-Nov-23	1	<1	<1	41	43	46	<0.5	2.7	<0.5	<0.5	36	33	30

Appendix #4

Anmore Water Quality Sampling Station Map


ANM 473
ANM 470
City of Port Moody
City of Port Moody