



Greater Vancouver Water District
2025 Water Quality Annual Report
Volume 1 of 2

March 2026

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Metro Vancouver acknowledges that the region's residents live, work, and learn on the shared territories of many Indigenous Peoples, including 10 local First Nations: q̓íçə́y̓ (Katzie), q̓ʷɑ:ḥłəḥ (Kwantlen), kʷíkʷə́łəm (Kwikwetlem), máthxwi (Matsqui), xʷməθkʷə́y̓əm (Musqueam), qiqéyt (Qayqayt), Semiahmoo, Sk̓wxwú7mesh Úxwumixw (Squamish), scə́wəθən məsteyəxʷ (Tsawwassen), and sə́lilwətał (Tsleil-Waututh).

Metro Vancouver respects the diverse and distinct histories, languages, and cultures of First Nations, Métis, and Inuit, which collectively enrich our lives and the region.

Volume 1 of 2 – A report produced annually summarizing the analysis of samples collected from the GVWD source reservoirs, water treatment plants and transmission system, as well as microbiological water quality of member jurisdictions' systems supplied by the Greater Vancouver Water District.

Volume 2 of 2 – A volume of analytical results from untreated and treated source water as well as representative locations throughout the GVWD Transmission system. Published under separate cover: Orbit 83836176.

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Acronyms/Abbreviations

ACU	Apparent Colour Unit
ALARA	As Low As Reasonably Achievable
AO	Aesthetic Objective (characteristics such as taste, odour, colour, appearance, temperature that are not health related)
BTEX	Benzene, Ethylbenzene, Toluene, Xylene
CALA	Canadian Association for Laboratory Accreditation
CO ₂	Carbon Dioxide
CWTP	Coquitlam Water Treatment Plant
DBP	Disinfection By-product
DWPR	<i>Drinking Water Protection Regulation</i>
DWTO	<i>Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies in British Columbia</i>
<i>E. coli</i>	<i>Escherichia coli</i>
GCDWQ	<i>Guidelines for Canadian Drinking Water Quality</i>
GVWD	Greater Vancouver Water District
HAA5	Haloacetic Acid 5 (measured as the sum of monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid)
HPC	Heterotrophic Plate Count
IFE	Individual Filter Effluent
MAC	Maximum Acceptable Concentration
µg/L	Microgram per litre (0.000001 g/L)
mg/L	Milligram per litre (0.001 g/L)
mL	Milliliter
ng/L	Nanogram per litre (0.000000001 g/L)
N/A	Not Applicable
NTU	Nephelometric Turbidity Unit
PAH	Polycyclic Aromatic Hydrocarbon
PFAS	Per- and polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
pH	Measure of acidity or basicity of water; pH 7 is neutral
SCFP	Seymour Capilano Filtration Plant
TSI	Trophic State Index
TTHM	Total Trihalomethane (measured as the sum of chloroform, bromodichloromethane, dibromochloromethane and bromoform)
UV ₂₅₄	Ultraviolet Absorbance at 254 nm
UVT	Ultraviolet Transmittance
VOC	Volatile Organic Compound
WQMRP	<i>Water Quality Monitoring and Reporting Plan for Metro Vancouver (GVWD) and Local Government Members</i>

Executive Summary

The Greater Vancouver Water District (GVWD) 2025 Water Quality Annual Report is required under the provincial *Drinking Water Protection Regulation* (DWPR). This annual report summarizes the analysis of approximately 169,000 tests conducted on samples collected from the GVWD source reservoirs, water treatment plants and transmission system, as well as microbiological and select chemical water quality testing results from member jurisdictions' systems, supplied by the GVWD.

The annual report outlines how GVWD's water quality monitoring program continues to fulfill its role in confirming that multiple protection barriers are maintaining high-quality drinking water for the region. This includes the continued protection of our water supply areas, effective and efficient water treatment processes, and uninterrupted operation of the water supply system by trained and certified operators.

In 2025, all of the health-based water quality parameters monitored by Metro Vancouver for the regional drinking water supply met the GVWD water supply operating permit, provincial water quality regulations, and the federal Guidelines for Canadian Drinking Water Quality (GCDWQ). Results of the analyses from the source water supply areas for herbicides, pesticides, volatile organic compounds and radionuclides were all found to be below the recommended limits for these substances as listed in the GCDWQ as well as British Columbia's *Source Drinking Water Quality Guidelines*.

As in past years, heavy rains were the cause of turbidity within the source supply reservoirs; however, in 2025 the turbidity levels were not as high as previous years. The highest daily average turbidity for the Capilano source was 4.2 Nephelometric Turbidity Unit (NTU) measured on December 16. The Seymour source's highest daily average turbidity of 6.0 NTU which occurred on December 19. The Seymour Capilano Filtration Plant (SCFP) effectively removed the excess sedimentation originating from these two sources. The unfiltered Coquitlam source water was greater than 1.0 NTU for just 5 days in the year and never exceeded 5.0 NTU; the highest daily average was 1.7 NTU on February 24.

The SCFP performance as measured by the quality of the delivered water was excellent in 2025. The daily average turbidity of water leaving the clearwell and entering the GVWD transmission system was 0.17 NTU. Filtration consistently removed iron, colour, and organics from the Capilano and Seymour source waters, and all disinfection requirements were met.

The Coquitlam Water Treatment Plant (CWTP), using ozone, ultraviolet, and chlorination systems, met all disinfection requirements.

Bacteriological water quality was excellent in the GVWD transmission mains and in-system storage reservoirs. The total coliforms detected in samples from both GVWD and water systems supplied with GVWD water was very low. More than 31,700 samples were collected and analyzed for GVWD and GVWD supplied systems in 2025; of those, only one sample from a GVWD supplied system was positive for *E. coli*. Repeat samples for the same location were taken, and no additional *E. coli* was found.

The isolation of Capilano Main No. 7, as part of the Second Narrows Water Supply Tunnel project water main tie-in work, caused some water to stagnate, which was followed by localized odour complaints. Tests confirmed low levels of four Polycyclic Aromatic Hydrocarbons (PAHs), including naphthalene, which is considered an aesthetic issue as there are no health-based drinking water guidelines for PAHs, except for benzo[a]pyrene (not detected). After flushing and returning the main to regular service, odours dissipated.

For the first time, Metro Vancouver experienced widespread earthy or musty tap water odour complaints in October that were caused by naturally occurring geosmin from the Seymour source. Odours were mitigated through operational changes. Drinking water remained safe to drink throughout the event.

1. Source Water Quality

The first barrier for assuring quality drinking water is protection of the source water supply areas. Source water monitoring provides ongoing confirmation that the barrier is effective, identifies seasonal changes, and provides the monitoring data necessary to inform water treatment process optimization changes, when necessary. Regular monitoring of the water sources is a requirement of the *Water Quality Monitoring and Reporting Plan for Metro Vancouver (GVWD) and Local Government Members (WQMRP)*. Refer to Appendix A for a summary of the water sampling frequencies for various parameters. Volume 2 of the Greater Vancouver Water District (GVWD) 2025 Water Quality Annual Report (published under a separate cover), contains detailed analytical test results from the source water supply areas.

1.1. Bacteriological Quality of Source Water Supply Areas

The bacteriological quality of the source water is an important indicator of the degree of any potential contamination, and the treatment required to ensure a high-quality water supply. *The Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies in British Columbia* (DWTO) Section 4.3 states: “The number of *E. coli* in raw water does not exceed 20/100 mL (or if *E. coli* data are not available less than 100/100 mL of total coliform) in at least 90% of the weekly samples from the previous six months. Treatment target for all water systems is to contain no detectable *E. coli* or fecal coliform per 100 mL.”

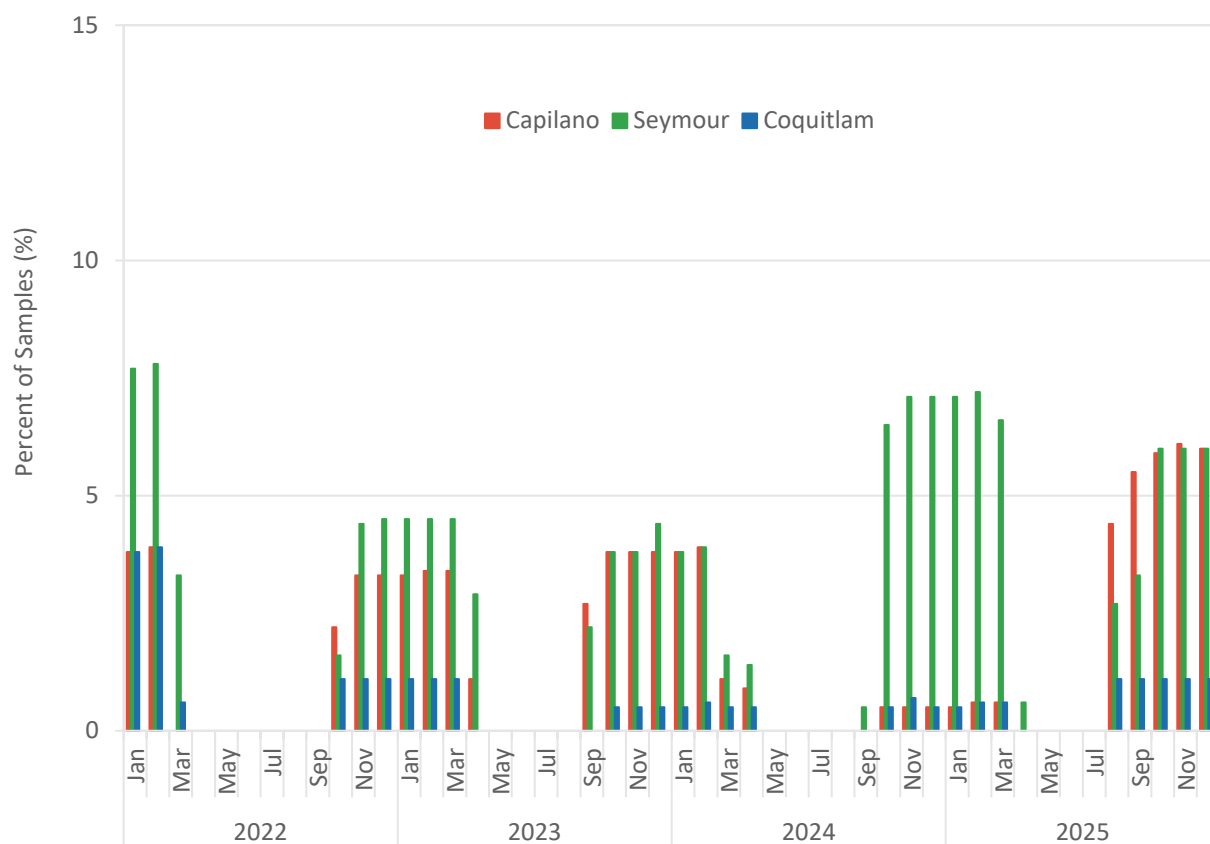
Table 1 summarizes *E. coli* data for all three GVWD water supply sources. The concentrations of *E. coli* for all three sources were below the 10% limit in the provincial DWTO.

Table 1: Percent of Samples in Six Continual Months that have *E. coli*/100 mL Exceeding 20

Month	Capilano	Seymour	Coquitlam
Jan	0.5	7.1	0.5
Feb	0.6	7.2	0.6
Mar	0.6	6.6	0.6
Apr	0.0	0.6	0.0
May	0.0	0.0	0.0
Jun	0.0	0.0	0.0
Jul	0.0	0.0	0.0
Aug	4.4	2.7	1.1
Sep	5.5	3.3	1.1
Oct	5.9	6.0	1.1
Nov	6.1	6.0	1.1
Dec	6.0	6.0	1.1

Figure 1 shows results for the analysis of source water from 2022 to 2025 at all three intakes compared to the limits for source water bacterial levels in the DWTO. As in previous years, all three sources met the limit of not more than 10% exceeding 20 *E. coli*/100 mL. Also, as is typical, samples collected at the intakes in the fall and winter had the highest *E. coli* levels. Typically, *E. coli* can be traced back to high flow levels at the main tributaries of the supply lakes, and a first flush phenomenon after a period of dry weather.

Figure 1: Percent of Samples Exceeding 20 *E. coli*/100 mL from GVWD Water Supply Sources (2022 to 2025)



1.2. Source Water Monitoring for *Giardia* and *Cryptosporidium*

Surface water supplies have the potential of containing the protozoan pathogens *Giardia* and *Cryptosporidium*. Outbreaks of *Giardiasis* occurred in a number of locations in BC and Washington State in the late 1980s, and Metro Vancouver has been monitoring source water for *Giardia* since 1987. Since 1992, Metro Vancouver has participated in a program with the Environmental Microbiology Laboratory of the BC Centre of Disease Control Public Health Laboratory to gather more information about the number and nature of cysts found within the GVWD water supply sources. The program has involved collecting samples from the Capilano, Seymour and Coquitlam sources upstream of disinfection.

Complete results of the 2025 testing program are contained in the Metro Vancouver Detection of Waterborne *Cryptosporidium* and *Giardia* Annual Report January - December, 2025, prepared by the Environmental Microbiology Laboratory of the BC Centre for Disease Control Public Health Laboratory, included in Appendix D.

One of twelve (8%) samples collected at Capilano, one of the twelve (8%) at Seymour, and one of twelve (8%) at Coquitlam were positive for *Giardia* in 2025. Table 2 summarizes *Giardia* data for the past ten years (Seymour sample collection began in 2022).

Table 2: Percent of Source Water Samples Positive for *Giardia*

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Capilano	50	58	33	33	33	25	17	50	8	8
Seymour	N/A	N/A	N/A	N/A	N/A	N/A	0	8	25	8
Coquitlam	17	67	8	25	25	25	8	8	0	8

Zero of twelve (0%) samples collected at Capilano, one of twelve (8%) at Seymour, and zero of twelve at Coquitlam (0%) were positive for *Cryptosporidium* in 2025. Table 3 summarizes *Cryptosporidium* data for the past 10 years (Seymour sample collection began in 2022).

Table 3: Percent of Source Water Samples Positive for *Cryptosporidium*

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Capilano	25	17	8	0	0	0	0	0	0	0
Seymour	N/A	N/A	N/A	N/A	N/A	N/A	0	8	0	8
Coquitlam	0	0	0	0	0	0	0	0	0	0

Year to year fluctuations are observed for *Giardia* and *Cryptosporidium*, with some years showing considerable variation in the results.

At the SCFP, monitoring for *Giardia* and *Cryptosporidium* has focused on the recycled water returning to the head of the plant, and this monitoring has confirmed that the procedures in place effectively control the levels of *Giardia* and *Cryptosporidium* in the recycled wash water from the filters. Zero of twelve (0%) samples collected were positive for *Giardia*, and zero of twelve (0%) were positive for *Cryptosporidium* in 2025. Table 4 shows the percentage of samples positive for *Giardia* and *Cryptosporidium* for the past 10 years.

Table 4: Percent of SCFP Recycled Water Samples Positive for *Giardia* and *Cryptosporidium*

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<i>Giardia</i>	17	8	0	0	0	0	0	0	0	0
<i>Cryptosporidium</i>	0	0	0	0	0	0	0	0	0	0

1.3. Turbidity

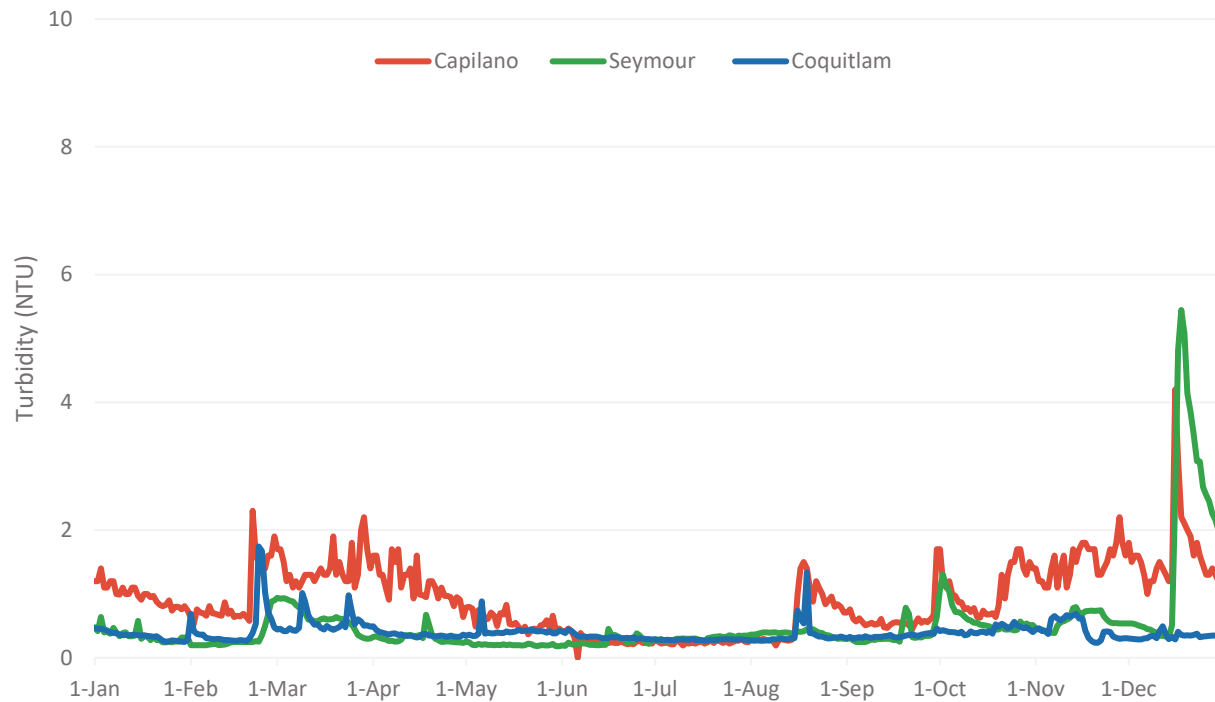
As shown in Figure 2, GVWD water sources have been susceptible to turbidity events due to high runoff from storms, which can cause slides and stream scouring in the water supply areas, or from suspension of sediment from the edges of the reservoirs during periods of low water levels. The DWTO allows a utility to be exempt from filtration if a minimum of two disinfectants providing 4-log reduction of viruses and 3-log reduction of *Cryptosporidium* and *Giardia* are used; the number of *E. coli* in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months; average daily turbidity level before disinfection is around 1 Nephelometric Turbidity Unit (NTU), but does not exceed 5 NTU for more than two days in a 12-month period; and a watershed control program is maintained. Specifically, Section 4.4 of the DWTO (Version 1.2, November 2012) contains the following provision for filtration exemption:

“For nonfiltered surface water to be acceptable as a drinking water source supply, average daily turbidity levels should be established through sampling at equal intervals (at least every four hours) immediately before the disinfectant is applied. Turbidity levels of around 1.0 NTU but not exceeding 5.0 NTU for more

than two days in a 12-month period should be demonstrated in the absence of filtration. In addition, source water turbidity also should not show evidence of harbouring microbiological contaminants in excess of the exemption criteria.”

Capilano and Seymour water is filtered, therefore the above source water criteria does not apply to the delivered water from these sources. Coquitlam, which is unfiltered, was in-service for all of 2025 in accordance with the DWTO.

Figure 2: Average Daily Turbidity of GVWD Water Supply Sources (From In-line Readings)



1.4. Chemistry

1.4.1. Chemical and Physical Analysis of the Source Water

The chemical and physical characteristics of the GVWD source water are summarized in Appendix B of this report; detailed analytical results are provided in Volume 2. The results from the chemical and physical analyses of the source water in 2025 were similar to those for previous years, with the exception of detecting geosmin in the Seymour source. Source water supply monitoring was carried out by accredited laboratories using methods based on the current version of *Standard Methods for the Examination of Water and Wastewater*. In 2025, at the request of the provincial Drinking Water Officers for Metro Vancouver, source water monitoring was also compared against British Columbia’s *Source Drinking Water Quality Guidelines* (2020). While Metro Vancouver historically monitored for most of the parameters within the *Source Drinking Water Quality Guidelines*, in 2025 three new parameters that had not previously been tested for were included (diisopropanolamine, sulfolane, and monochlorophenol). All tested parameter results within Metro Vancouver’s three source water supplies were below the values within the *Source Drinking Water Quality Guidelines* - see Appendix 3 for detailed analytical results.

1.4.2. Analysis of Water for Organic Components and Radionuclides

Analyses of the source water supplies for a variety of organic and other compounds, including all of the compounds with a specified Maximum Acceptable Concentration (MAC) from Health Canada's GCDWQ, is carried out on an annual basis in accordance with the WQMRP. The results are contained in Appendix C of this report and in Volume 2. No parameters were detected above the applicable GCDWQ health-based guidelines.

1.4.3. Per- and Polyfluorinated Substances

Per- and polyfluoroalkyl substances are a group of synthetic compounds collectively known PFAS. Common sources of these ubiquitous chemicals, which were used because of their water and oil repellant properties, include a variety of consumer products and fire-fighting foams. In August 2024, Health Canada released a drinking water objective of 30 ng/L for the sum of 25 individual PFAS compounds. Source water and treated water data for all 25 PFAS compounds can be found in Appendix C. Within the three source water supplies, all results for PFAS compounds were below both British Columbia's *Source Drinking Water Quality Guidelines* as well as Health Canada's drinking water objective value.

1.4.4. Limnology

The annual reservoir limnology monitoring, started in 2014, collects limnology data (physical, chemical and biological parameters) for the Capilano, Seymour and Coquitlam supply reservoirs. This monitoring information significantly contributes to the proactive management of the supply reservoirs, as water quality could be impacted by environmental variability and climate change. This program assists in ensuring that variation and trends in reservoir water quality are scientifically tracked over time.

Water samples from the source reservoirs, inflow streams, and tributaries are collected between April and November. Biological productivity that can influence water quality is highest during this time of year, making it an important time for taking samples and measurements. Monthly sampling of source waters is conducted and sample testing is undertaken by accredited labs. More frequent water quality data are measured by arrays of scientific instruments located in each reservoir.

Analysis of 2025 data, as in previous years, confirms that the three source reservoirs fall well within the oligotrophic classification based on the parameters shown in Table 5, which means they have low nutrient concentrations, low levels of biological production, and are considered very high-quality source waters. These parameters are at the lower end of data ranges for oligotrophic waterbodies identified in the literature, and the three reservoirs can be deemed 'ultra-oligotrophic'.

Table 5: Comparison of Water Quality in GVWD Water Supply Sources to Standard Water Quality Classifications

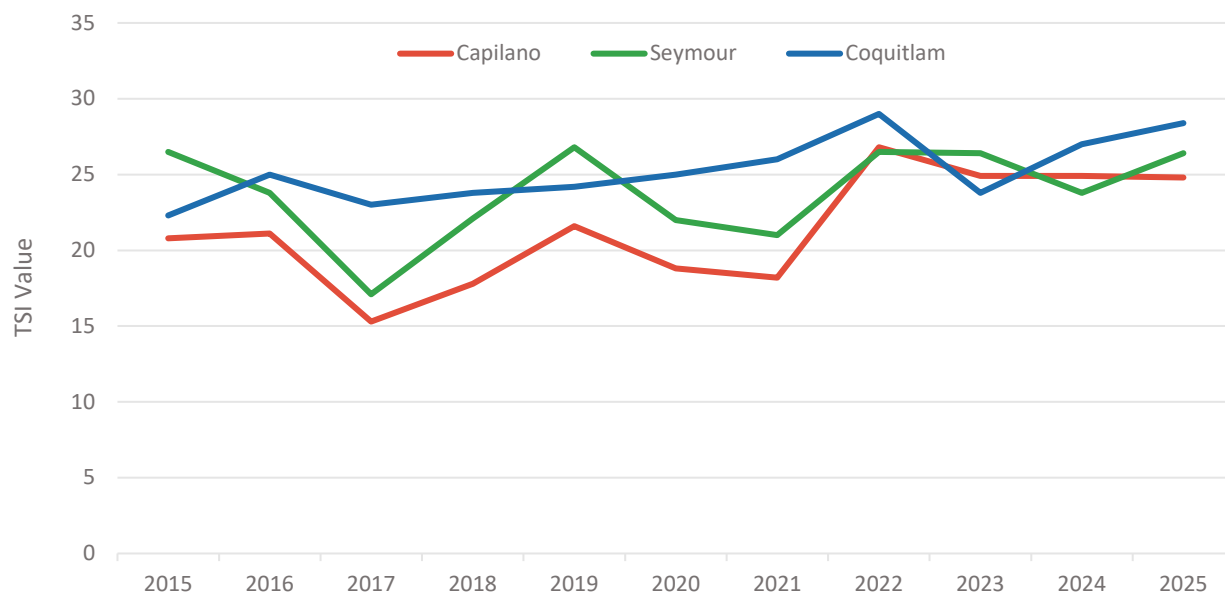
Parameter	Mean Value - Oligotrophic Status ^{1,2}	Average Value		
		Capilano Reservoir 2014-2025 (2025 only)	Seymour Reservoir 2014-2025 (2025 only)	Coquitlam Reservoir 2014-2025 (2025 only)
Total Phosphorus (µg/L)	8.0	2.9 (3.0)	3.3 (3.0)	2.1 (2.2)
Total Nitrogen (µg/L)	661	109 (111)	92 (108)	88 (109)
Phytoplankton Biomass (µg/L of chlorophyll-a)	1.7	0.67 (0.50)	0.65 (0.57)	0.8 (0.62)
Status of Reservoirs ^{1,2}		Ultra- oligotrophic	Ultra- oligotrophic	Ultra- oligotrophic

¹General trophic classification based on study of more than 200 lakes and reservoirs.

²Wetzel, R.G. 2001 Lake and River Ecosystems. 3rd edition. Academic Press. New York.

The Trophic State Index (TSI) is used to infer change over time in water quality based on the amount of algal biomass in the water column of each source reservoir. Figure 3 shows TSI values over the last 10 years for each of the three primary source reservoirs, which will continue to be tracked and referenced to assist in monitoring changing weather, climate and nutrient conditions. A TSI of <30 to 40 is considered oligotrophic.

Figure 3: Trophic State Index of Source Waters



The ultra-oligotrophic classification and low TSI values are highly desirable for source drinking water supplies and shows that the GVWD Water Supply Areas continue to supply high-quality source water.

There is worldwide interest in blue-green algae (also known as cyanobacteria) in drinking water reservoirs. These algae can produce toxins that are collectively known as microcystins. A common cyanobacterium in GVWD reservoirs, called *Merismopedia* spp., is thought to have the ability to produce microcystins. Despite the presence of cyanobacteria, the concentration of microcystins in GVWD source reservoirs remains consistently below the detection limit of 0.2 µg/L. This desirable condition is due to the ultra-oligotrophic status of the supply reservoirs. Metro Vancouver continues to monitor cyanobacteria, including *Merismopedia* spp., as well as processes in the source reservoirs that control the growth of cyanobacteria and other algae. These data are routinely used to help predict changes to water quality over time related to climatic and environmental change, and aid in making proactive decisions about ongoing source reservoir management strategies.

1.4.5. Geosmin

For the first time, Metro Vancouver began receiving public reports of unusual odours in tap water in mid-October. Specifically, earthy or musty odours were being reported from residents of the District of North Vancouver, City of North Vancouver, Vancouver, Burnaby, Delta, parts of Coquitlam, and the Tsawwassen First Nation. Based on described odours, geosmin and 2-methylisoborneol were suspected and tested for in all source water supplies as well as treated drinking water. Geosmin is a naturally occurring compound produced by bacteria and algae in surface waters as well as by benthic (bottom-dwelling) cyanobacteria, which imparts an earthy or musty odour. While unpleasant, geosmin is not harmful to health.

Initial sampling on October 27 showed geosmin concentrations of 11 ng/L in raw water from the Seymour source and 10 ng/L in treated water leaving the SCFP. Both the Capilano and Coquitlam Reservoirs showed no detectable levels. There was no detection of 2-methylisoborneol in any of the samples that were tested.

In response to the detection of geosmin, the system operation was adjusted by reducing the amount of source water originating from Seymour and increasing flows from Capilano to mitigate the aesthetic issue. Throughout this period, the drinking water remained safe to consume. Following operational changes, monitoring showed a steady decline in geosmin concentrations in the treated water leaving the SCFP. By November 5, while there was still detectable geosmin (6 ng/L) in the Seymour Reservoir, treated water from the SCFP tested below detectable limits (<3 ng/L), and public complaints had largely subsided. Geosmin testing results for samples collected from the Capilano and Seymour sources as well as for the treated water leaving the SCFP are shown in Table 6.

Table 6: Capilano and Seymour Source Water and Treated Water Results for Geosmin

	Capilano Source (ng/L)	Seymour Source (ng/L)	SCFP Treated Water (ng/L)
October 27, 2025	<3	11	10
November 5, 2025	<3	6	<3
November 7, 2025	<3	6	<3
November 17, 2025	<3	<3	<3
November 24, 2025	<3	<3	<3

2. Quality Control Assessment of Water Treatment

Following source water protection, primary treatment of the source water is the second barrier used to assure the high-quality of supplied drinking water.

Metro Vancouver filters water from the Capilano and Seymour source reservoirs at the SCFP, which is located in GVWD's Lower Seymour Conservation Reserve. Twin tunnels connect the two supply sources. The untreated Capilano source water is pumped through a raw water tunnel and is blended with the Seymour source water (under regular operations) at the inlet to the SCFP. Both treated sources enter the clearwell at the SCFP for further treatment before the blended water enters the transmission system, typically supplying about two thirds of the region's drinking water. Blended treated water returns to the Capilano service area through a treated water tunnel, providing high-quality drinking water to the Capilano area, while the remainder is transmitted through the Seymour system.

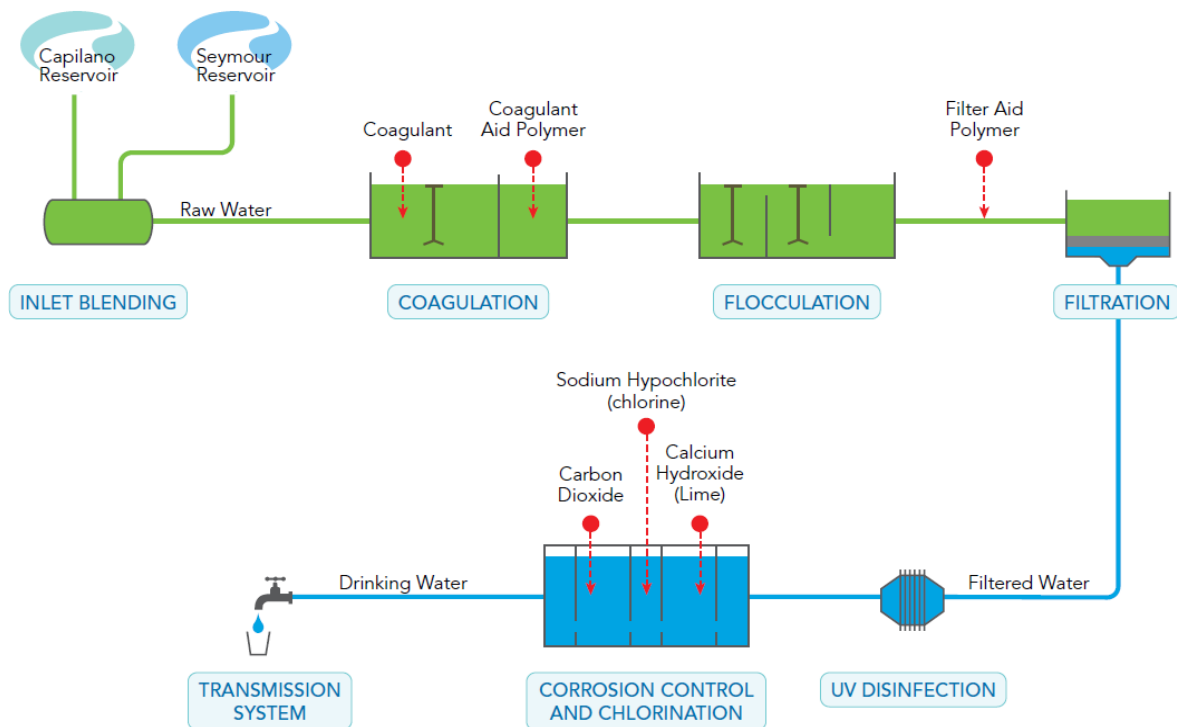
The Coquitlam Water Treatment Plant (CWTP) is located north of the City of Coquitlam, and typically supplies about one third of the region's drinking water. Due to the historically low turbidity levels, the Coquitlam source water is not filtered.

Metro Vancouver operates the water supply system under the *GVWD Permit to Operate* issued jointly by Vancouver Coastal Health and Fraser Health Authorities. The permit stipulates that Metro Vancouver must meet the requirements to achieve at least a 4-log (99.99%) reduction and/or inactivation of viruses, and at least a 3-log (99.9%) reduction and/or inactivation of *Giardia* cysts and *Cryptosporidium* oocysts. Operationally, Metro Vancouver meets the permit requirements, managing microbial risks using a combination of direct filtration, ultraviolet (UV) light and chlorine at the SCFP, and ozone, UV light and chlorine at the CWTP.

2.1. Seymour Capilano Filtration Plant

The SCFP is a chemically assisted direct filtration plant, which uses polyaluminum chloride as a coagulant with polymers to improve particle removal. These substances help aggregate particles to form visible floc. The flocculated particles are removed by passing this water through a filter medium of anthracite and sand. The result is the production of filtered water, which is then exposed to UV light as the water exits each filter. The final processes are the addition of sodium hypochlorite (chlorine) and calcium hydroxide (hydrated lime) before the water enters the clearwell. The clearwell, divided into the west and east cells, is a large water storage reservoir that stores and allows controlled passage and mixing of water with the injected chlorine and hydrated lime. The clearwell provides sufficient retention (or contact time) with chlorine to provide any further disinfection required after filtration and UV light treatment. The treatment process of the SCFP is shown in Figure 4.

Figure 4: Seymour Capilano Filtration Plant Treatment Process



As part of corrosion control, carbon dioxide (CO₂) in solution is added to trim pH once the desired alkalinity is reached using hydrated lime. After the clearwell, the finished water enters the transmission system at the Seymour treated water valve chamber.

2.1.1. Filtration

Filtration of the Capilano and Seymour water sources improves the characteristics of the delivered water. One improvement is the removal of the brown hue that is characteristic of Capilano and Seymour source waters. This is achieved with the removal of naturally occurring compounds, resulting in a visible decrease in colour and increase in clarity. In addition, suspended particles in water that cause light to scatter (turbidity) are also removed. The end-product is water that is very clear and may have a slight bluish tinge. Figure 5 compares the apparent colour of SCFP filtered water with Capilano and Seymour source waters for 2025. The Seymour source had an Apparent Colour Unit (ACU) of 23 ACU in September, and the Capilano source had an ACU reading of 22 ACU in December. The SCFP removes organic material through filtration, resulting in a final colour of near zero ACU. Throughout 2025, the colour of the filtered water delivered to the public was never greater than 3 ACU.

Figure 5: Apparent Colour Levels Before and After Filtration

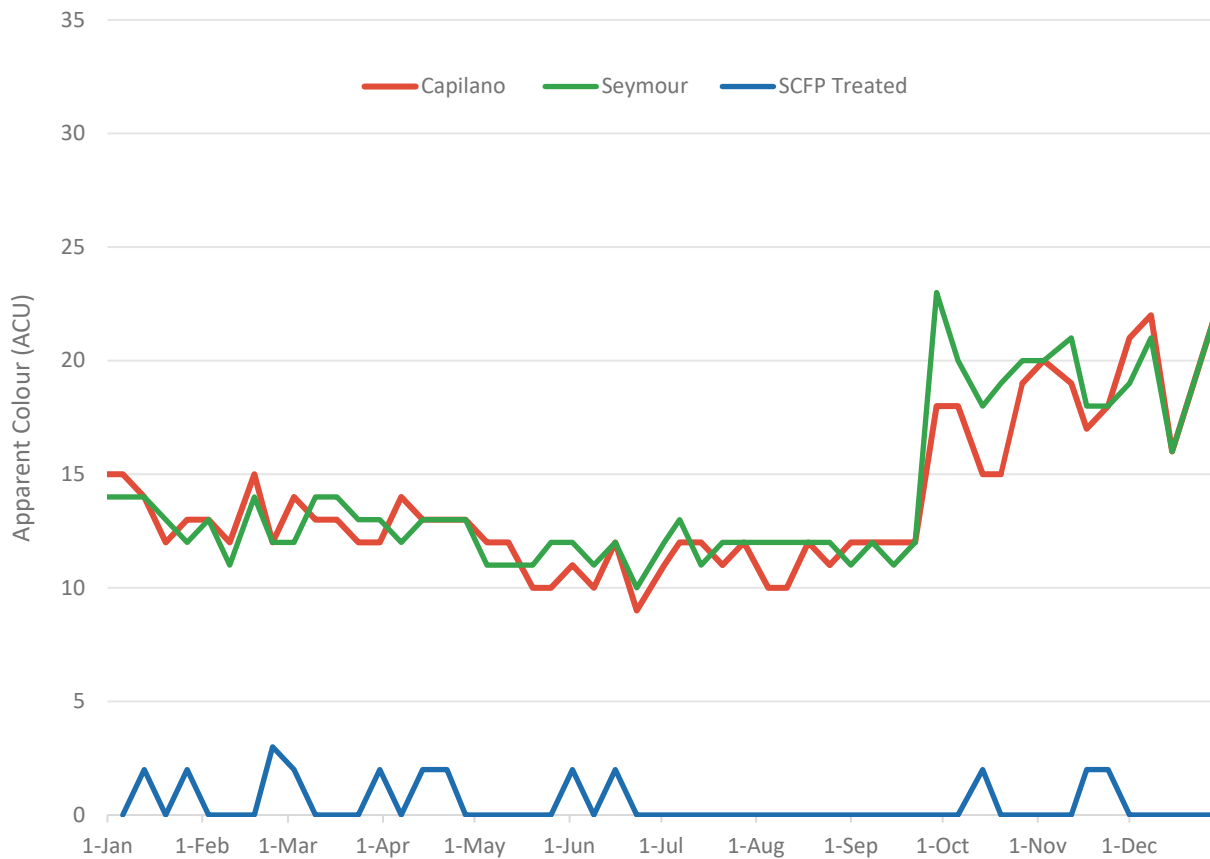
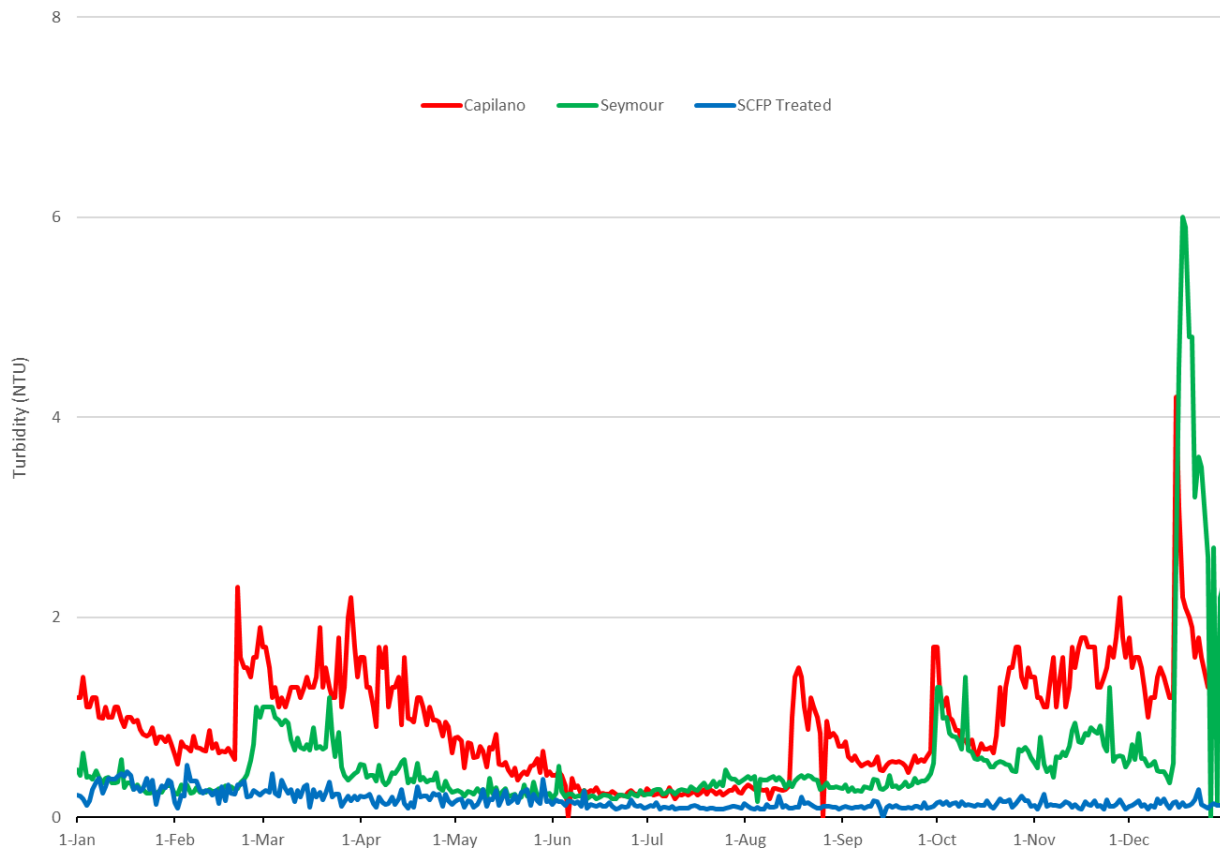


Figure 6 compares turbidity of the two source waters that feed the SCFP to the turbidity level of the treated water. The Seymour source experienced an average daily turbidity greater than 1.0 NTU for 26 days. The Capilano source exceeded 1.0 NTU for 155 days. Since both sources are filtered at the SCFP, the maximum turbidity of the treated water was 0.52 NTU, measured on February 5, 2025, and the annual average was 0.17 NTU.

Figure 6: Daily Turbidity Levels Before and After Filtration at SCFP



Removal of turbidity from the source water improves the aesthetic qualities of the water, but it also has the benefit of removing certain types of pathogenic microorganisms that may be present. At a minimum, properly run direct filtration plants such as the SCFP will remove up to 2.5 log (two log is a 99% reduction) of *Giardia* and *Cryptosporidium*, plus 1 log of viruses. To ensure this removal, it is critical that the performance of each filter, determined by the turbidity of its effluent, is monitored on a continuous basis.

The GCDWQ states: “For conventional and direct filtration, less than or equal to 0.3 nephelometric turbidity units (NTU) in at least 95% of measurements either per filter cycle or per month and never to exceed 1.0 NTU.”

According to the GCDWQ, ideally, the turbidity from each filter would never exceed 0.1 NTU; however, there are rare occurrences of turbidity readings that exceed this ideal level. The turbidity performance of all 24 filters is measured by examining the percent of time that the turbidity of each Individual Filter Effluent (IFE) met the turbidity guidelines of not greater than 1.0 NTU, and at least 95% of the time less than 0.3 NTU. The results are summarized in Table 7. In 2025 the IFE was never greater than 1.0 NTU, however, there were a few incidences of filter turbidity readings that were greater than 0.3 NTU, but all remained well within the 95% limit.

Table 7: Monthly Filter Effluent Turbidity Summary

Month	Occurrence of IFE Turbidity greater than 1.0 NTU (None Allowed)	Percent of Time IFE Turbidity was less than 0.3 NTU (Minimum 95% Required)
January	0	99.998
February	0	100
March	0	100
April	0	100
May	0	100
June	0	100
July	0	100
August	0	99.998
September	0	100
October	0	99.998
November	0	99.997
December	0	99.997

Under normal operating conditions, the average maximum turbidity of the water, post filtration, and before disinfection and corrosion control at the SFCP was 0.04 NTU.

All water that flows through the filters immediately passes through the UV units. The intensity of the UV lamps automatically increases when there is an increase in turbidity or colour of the water exiting each filter. After UV treatment, the water is chlorinated as it enters the clearwell.

2.1.2. Ultraviolet Treatment

Water passing through each filter is subsequently treated with UV light. UV treatment is effective in altering the DNA structure of *Giardia* and *Cryptosporidium* thus rendering cysts and oocysts, respectively, of these parasites, non-infectious. Other disinfectants, especially chlorine, are ineffective against *Cryptosporidium* oocysts at reasonable dosages. In the unlikely event of a breakthrough of *Cryptosporidium* oocysts, especially at the end of a filter run, UV light is present to render any parasites that may be present as non-infectious. Cysts and oocysts are not able to proliferate inside the intestines of human hosts to cause illness after a sufficient dose of UV light. The target dosage for UV light is to achieve 2-Log (99%) *Giardia* and *Cryptosporidium* inactivation.

Under normal operating conditions, two rows of lamps operating at 75% power provide sufficient UV light to meet the dosage requirement for 2-log reduction of *Giardia* and *Cryptosporidium*. Table 8 summarizes the performance of the SFCP UV system in 2025.

Table 8: Percent of Volume Meeting Ultraviolet Dosage Requirements at SCFP

Month	Percent of Monthly Volume $\geq$ 2-log of <i>Giardia</i> and <i>Cryptosporidium</i> Inactivation (95% of monthly volume required)
January	99.861
February	99.954
March	99.928
April	99.926
May	99.901
June	99.951
July	99.943
August	99.923
September	99.958
October	99.937
November	99.945
December	99.936

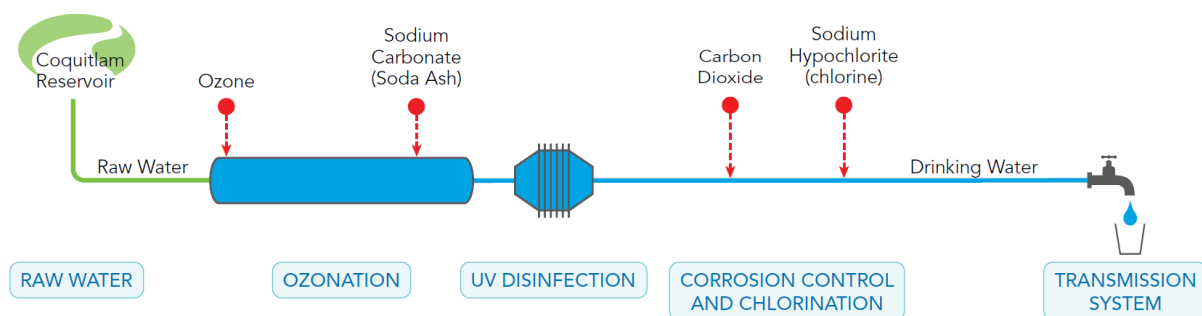
2.1.3. Chlorination

Chlorination is used for disinfection at the SCFP, as well as at downstream secondary disinfection stations to minimize bacterial regrowth in the GVWD transmission and GVWD supplied distribution systems. Chlorination provides 4-log virus inactivation with liquid sodium hypochlorite. The chlorination system was operational 100% of the time in 2025.

2.2. Coquitlam Water Treatment Plant

The CWTP treats Coquitlam source water using multiple disinfection barriers, specifically, ozone, UV and chlorine, and provides corrosion control as shown in Figure 7. The Coquitlam source water is not filtered. Ozone contact is achieved in a stainless steel contactor water main that connects the Ozonation facility with the Corrosion Control and Chlorination facility. The primary function of ozone is to improve the ultraviolet transmittance (UVT) of the water to improve its clarity for subsequent UV light treatment and oxidize organic precursors responsible for the formation of disinfection by-products (DBPs) following chlorination.

Figure 7: Coquitlam Water Treatment Plant Treatment Process



Ozone also provides disinfection capacity for *Giardia* and viruses. UV light is the primary process for inactivation of *Giardia* and *Cryptosporidium* and chlorine for viruses. Corrosion control is achieved using sodium carbonate and CO₂; the latter is added to trim the pH once the desired alkalinity is reached. After chlorination, the finished water enters the transmission system.

2.2.1. Ozonation

Ozone is intended as a pre-treatment; however, it also provides complete backup for inactivation of *Giardia*, should the UV treatment system be offline. Ozonation also provides full virus inactivation in addition to chlorination. The ozonation system was operational for 99.6% of the time in 2025. The ozone outages were due to a combination of planned and unplanned events that included electrical or instrument maintenance, ozone dosing tests, and ozone generator faults or testing.

2.2.2. Ultraviolet Treatment

UV light treatment provides for primary disinfection and achieves 3-log inactivation of the chlorine-resistant microorganisms, *Giardia* and *Cryptosporidium*. Water is directed into 8 UV units. BC *Guidelines for Ultraviolet Disinfection of Drinking Water* requires that the ultraviolet disinfection process results in target *Giardia* and *Cryptosporidium* inactivation in at least 95% of the treated water volume on a monthly basis, which is summarized in Table 9. There was no loss of UV in 2025. The small percentage of water that did not meet the criteria was the result of unplanned events, as well as planned power outages required to test the emergency back-up power system.

Table 9: Percent of Volume Meeting Ultraviolet Dosage Requirements at CWTP

Month	Percent of Monthly Volume ≥ 3-log <i>Giardia</i> and <i>Cryptosporidium</i> Inactivation (Minimum 95% Required)
January	99.835
February	99.903
March	99.908
April	99.768
May	99.909
June	99.909
July	99.891
August	99.891
September	99.908
October	99.872
November	99.895
December	99.893

2.2.3. Chlorination

Chlorination is used for disinfection at the CWTP, as well as at secondary disinfection stations to minimize bacterial regrowth in the GVWD transmission and GVWD supplied distribution systems. Chlorination provides 4-log virus inactivation using a liquid sodium hypochlorite solution. There was one event in 2025 when the chlorination system did not operate continually. On October 14, 2025, a valve on the sodium hypochlorite system feed closed unexpectedly while ozone treatment was off-line for planned maintenance. The UV system remained operational during the event. There was a resulting drop in chlorine residual that lasted for approximately 9 minutes. Leaving the plant, chlorine residuals in Coquitlam water

mains No. 2 and 3 were in the order of 0.2 to 0.3 mg/L, while turbidity remained low at 0.4 NTU. At the time of the event, Fraser Health was notified.

2.3. Secondary Disinfection

There are eight secondary disinfection stations operated by Metro Vancouver. The purpose of these stations is to increase the chlorine residual in the GVWD transmission and GVWD supplied distribution systems to meet a target residual based on a number of factors, including source water turbidity, the amount of bacterial regrowth detected in the GVWD supplied distribution system samples, and the chlorine demand in the water. The rate of chlorine decay is lower in the areas receiving filtered water from the SCFP and consequently, lower chlorine dosage levels are required to maintain desired chlorine residual levels. The target chlorine residual leaving the SCFP is 0.80 mg/L. The target chlorine residual leaving the CWTP ranges from 1.3 to 1.5 mg/L. These chlorine residuals leaving the treatment plants have been established to maintain target chlorine residuals throughout the GVWD transmission system of 0.5 mg/L or greater. The secondary disinfection facilities receiving SCFP water frequently have an incoming chlorine residual high enough that boosting is not required.

Table 10 summarizes the performance of the secondary disinfection facilities in 2025.

Table 10: Performance of Secondary Disinfection Facilities

Facility	Branch Main	Average Free Chlorine (mg/L)	Range of Free Chlorine (mg/L)	Discussion
Clayton	Whalley/Clayton	1.19	0.94 - 1.46	Supplied by CWTP water.
	Jericho/Clayton	1.23	1.06 - 1.72	
Chilco	Capilano No.4 and No.5	0.78	0.39 - 0.97	Supplied by SCFP water. Station was removed from service for the Stanley Park Water Supply Tunnel project beginning on October 15 and remained out of service for the remainder of the year.
Pitt River	Haney Main No.2	1.21	0.75 - 1.41	Supplied by CWTP water. In 2025 the station was continually operated, with the exception of two outages related to power loss, February 2 for 20 minutes and February 13 for 3 hours.
	Haney Main No.3	1.20	0.90 - 1.43	
Newton	Surrey Hickleton Main	1.22	0.70 - 1.70	This station is alternately supplied by SCFP or CWTP water. In 2025, the station was in operation when required. From November 21 to 23, there was lower than expected residual chlorine leaving the station due to an issue with the chlorine outlet valve.
Kersland	Capilano No.4 and No.5	0.89	0.82 - 0.93	Supplied by SCFP water.

Facility	Branch Main	Average Free Chlorine (mg/L)	Range of Free Chlorine (mg/L)	Discussion
Central Park	South Burnaby Main No.1	0.88	0.77 - 1.31	Primarily supplied by SCFP water, but is occasionally supplied by CWTP water, depending on flow demands.
	South Burnaby Main No.2	0.92	0.66 - 1.26	From October 15 to 21, the dosing setpoint was increased to counteract any possible in-system turbidity issues resulting from a flow reversal within a regional water main supplying the City of Vancouver. This was required to facilitate the Stanley Park Water Supply Tunnel project construction.
Cape Horn	Coquitlam Main No.2	1.21	0.98 - 1.48	Supplied by CWTP water.
	Coquitlam Main No.3	1.21	1.05 - 1.44	In 2025 the station operated continually.
Vancouver Heights	Boundary Road Main No.5	0.86	0.72 - 1.00	Supplied by SCFP water. This station was out of service from March 31 to May 5 and September 2 to October 7 as sections of water mains were isolated for worker safety during the tie-in of Capilano Main No.7 to the Second Narrows Water Supply Tunnel.

2.4. Corrosion Control

Metro Vancouver's corrosion control program began in the 1990s, and involves several steps to reduce pipe corrosion. As part of the *Corrosion Control Program: Copper Pipes Protection* initiative, further changes in pH and alkalinity were made in June 2021 to help reduce pipe corrosion through the addition of natural minerals. Corrosion control parameters are continually monitored to assess need for future adjustments.

Untreated water from all three sources had a pH lower than the limit of the GCDWQ of pH 7.0.

In the SCFP process, filtered water is dosed with calcium hydroxide (hydrated lime) to raise its pH and alkalinity before it enters the Clearwell. To achieve the desired alkalinity, the resultant pH is trimmed using CO₂ to reduce it to target levels.

At the CWTP, sodium carbonate (soda ash) is added to raise the pH and neutralize the remaining ozone in the water prior to it entering the UV units. Similar to the SCFP, CO₂ is used to trim the resultant pH to desired target levels.

During 2025, the average pH of the treated water was 8.4 leaving both the SCFP and CWTP.

Performance of the corrosion control facilities is summarized in Table 11.

Table 11: Performance of Corrosion Control Facilities

Facility	Performance	Discussion
SCFP Corrosion Control	pH ranged from 7.2 to 9.6	The annual average pH was 8.4, as continually monitored with online instrumentation, and was within the GCDWQ range.
CWTP Corrosion Control	pH ranged from 6.8 to 9.6	The annual average pH was 8.4, as continually monitoring with online instrumentation. The GCDWQ for pH of 7.0 to 10.5 was not met on March 9, 2025 for 30 minutes while repairs to the soda ash system were conducted.

3. Transmission/Distribution System Water Quality

Schedule A of the BC *Drinking Water Protection Regulation* (DWPR) stipulates standards for the bacteriological quality of potable water in the Province. There are three components of this standard that apply to large utilities such as the GVWD and GVWD supplied systems. These are:

Part 1: No sample should be positive for *E. coli*.

Part 2: Not more than 10% of the samples in a 30-day period should be positive for total coliform bacteria when more than one sample is collected.

Part 3: No sample should contain more than 10 total coliform bacteria per 100 mL.

The DWPR does not contain any water standards other than the three limits for *E. coli* and total coliform bacteria. Information on the significance of the detection of these organisms can be found in the GCDWQ – Supporting Documents, specifically:

“*E. coli* is a member of the total coliform group of bacteria and is the only member that is found exclusively in the faeces of humans and other animals. Its presence in water indicates not only recent faecal contamination of the water but also the possible presence of intestinal disease-causing bacteria, viruses and protozoa.”

“The presence of total coliform bacteria in water in the distribution system (but not in water leaving the treatment plant) indicates that the distribution system may be vulnerable to contamination or may simply be experiencing bacterial regrowth.”

To summarize, the detection of *E. coli* bacteria in a sample of treated water is an indication of a potentially serious risk. The detection of total coliform bacteria may indicate intrusion into the system, or it may indicate that these bacteria are growing in the system itself (regrowth).

In 2025, 99.9% of the samples tested were negative for coliforms, which is a good indicator of effective water treatment as well as good GVWD transmission system and overall distribution system water quality.

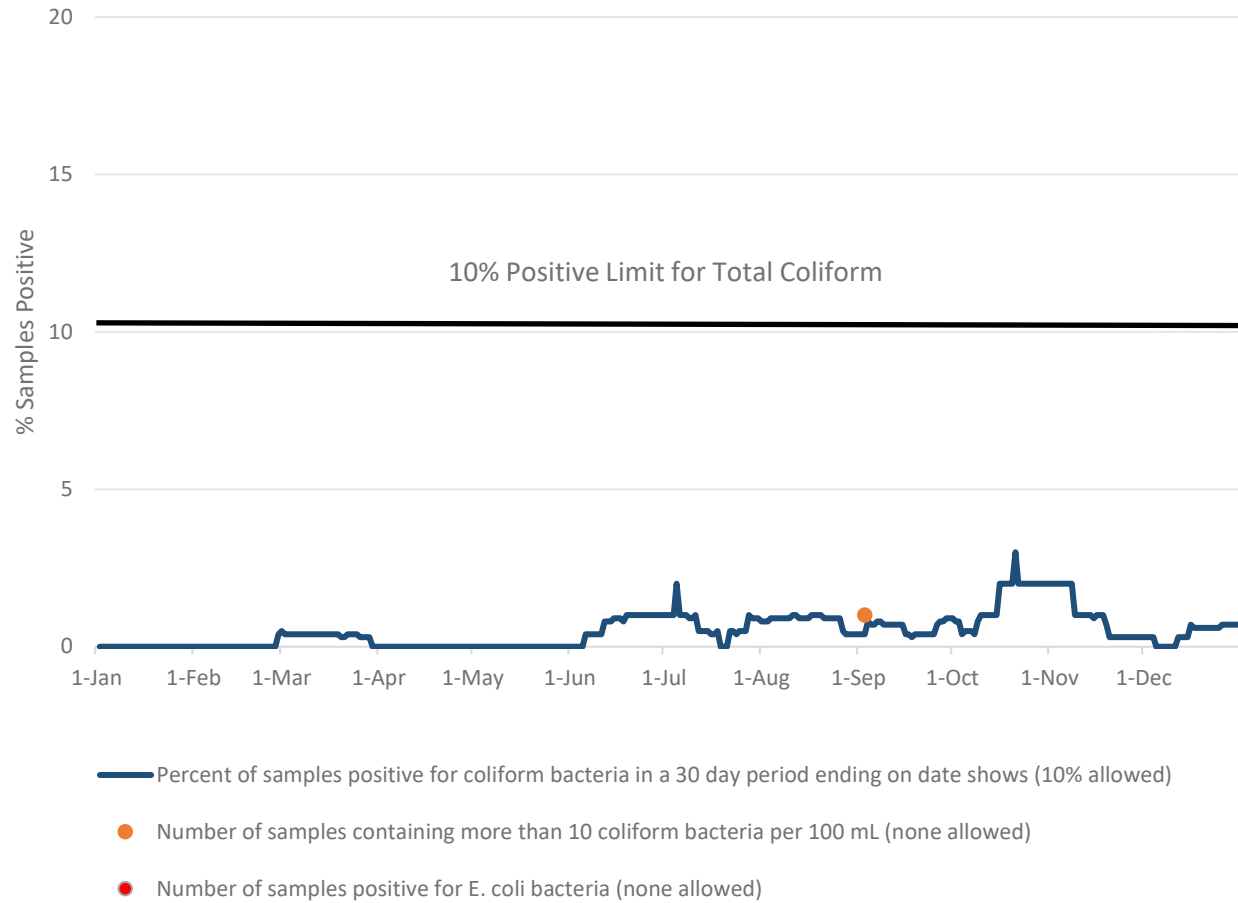
3.1. Microbiological Water Quality in the GVWD System

3.1.1. GVWD Water Mains

Water quality in GVWD water mains is monitored from the point leaving the source and throughout the transmission system. In 2025, there were approximately 4,400 samples collected and tested for the presence of indicator bacteria. The percentage of samples from the GVWD water mains that were positive for total coliform bacteria was well below the 10% standard. Fifteen samples in the GVWD system tested positive for total coliforms of which one had more than 10 CFU/100mL. In all instances the residual chlorine values were acceptable and follow-up samples did not detect any total coliforms. No samples were positive for *E. coli* bacteria. The compliance of monitoring results from GVWD water mains with the BCDWPR criteria are shown in Figure 8.

In addition, there are in-line stations collecting chlorine data every 10 minutes after chlorination at each source, but these samples are not included in the calculations for compliance monitoring.

Figure 8: Bacteriological Quality of Water in GVWD Water Mains

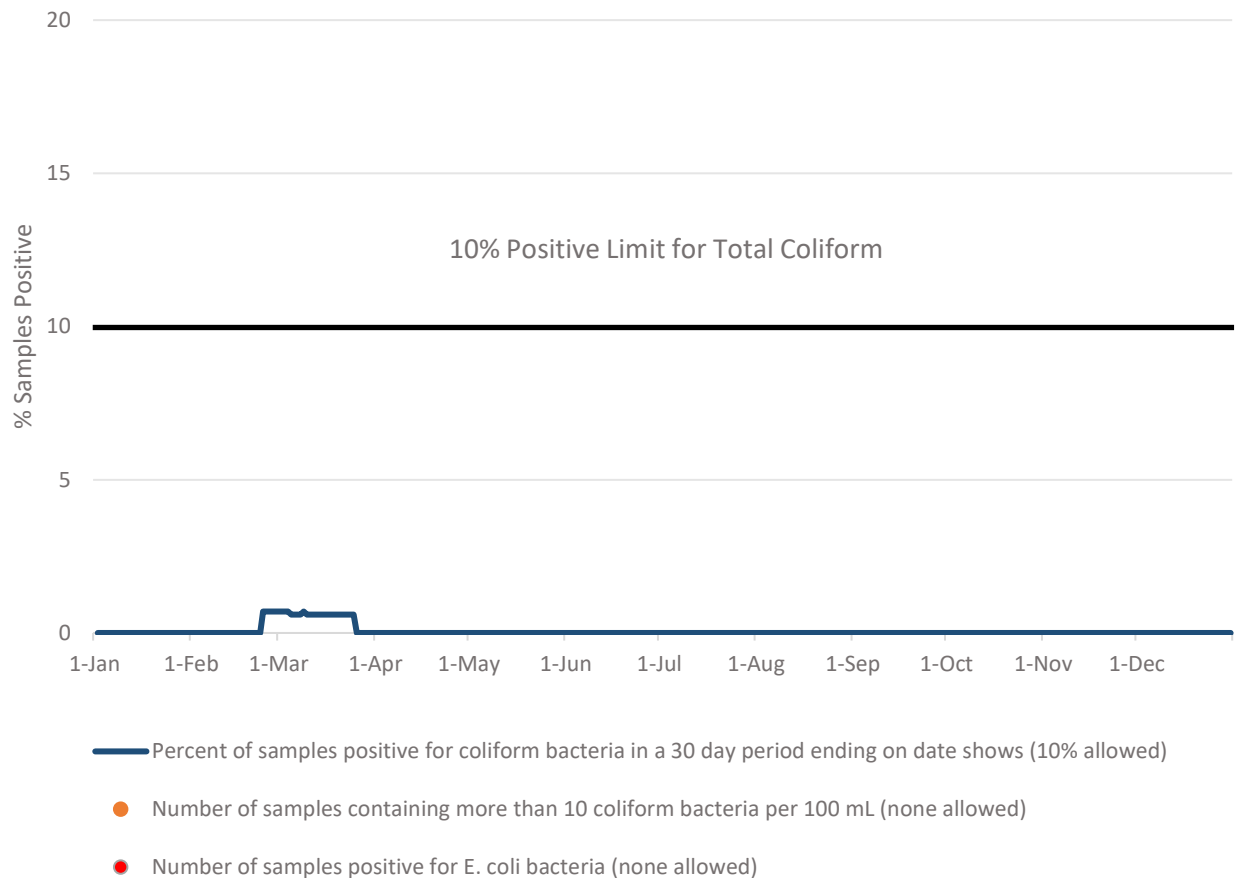


3.1.2. GVWD In-System Reservoirs

In 2025, almost 1,900 samples were collected from in-system reservoirs that are located throughout the GVWD transmission system. One sample was positive for total coliforms. No samples from a reservoir were positive for *E. coli*.

The compliance of 2025 monitoring results from GVWD reservoirs with the criteria in the DWPR are shown in Figure 9.

Figure 9: Bacteriological Quality of Water in GVWD In-System Reservoirs



Reservoir water quality is optimized using secondary disinfection coupled with an active reservoir cycling (fill and draw) and cleaning program. As a minimum, weekly monitoring of chlorine residuals and bacteriological testing are performed, which helps inform the need for operational changes to filling cycles.

Table 12 provides an overview of the status of the GVWD in-system reservoirs from 2022 to 2025. During certain times of the year, it is not possible to cycle reservoirs as often as desired due to operational constraints with the system. Despite constraints, only one out of almost 1,900 samples taken from in-system reservoirs contained total coliforms.

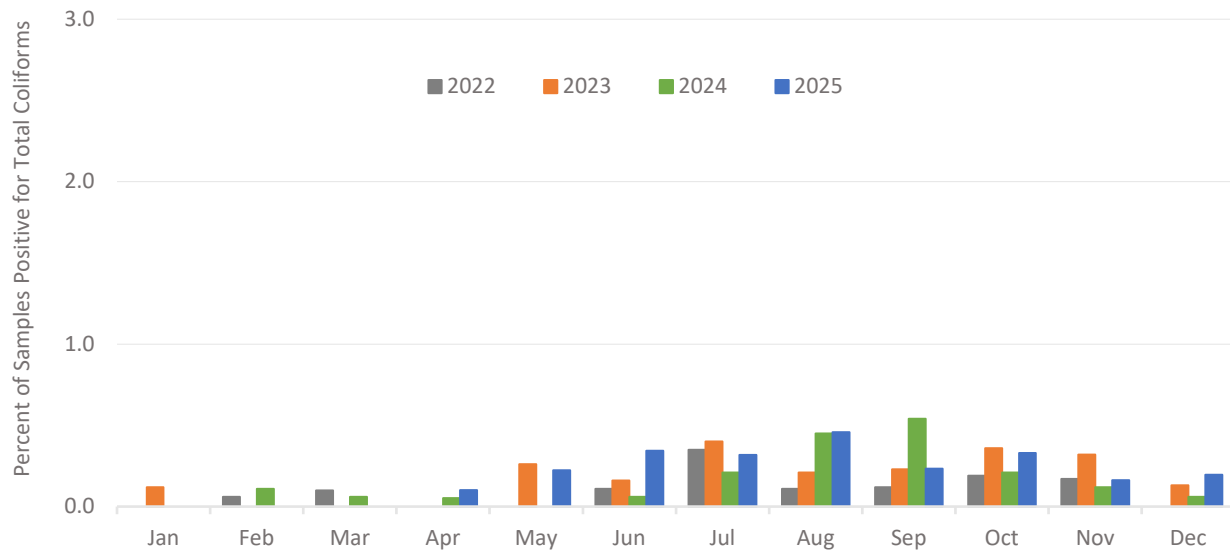
Table 12: Status of GVWD In-System Reservoirs (2022-2025)

Reservoir (Capacity in Million Litres)	Average free chlorine residual (mg/L)				Discussion
	2022	2023	2024	2025	
Burnaby Mountain Reservoir (13.2)	0.49	0.43	0.45	0.50	No operational issues.
Burnaby Tank (2.3)	0.56	0.52	0.56	0.57	No operational issues.
Cape Horn Reservoir (40.0)	0.78	0.82	0.74	0.71	No operational issues.
Central Park Reservoir (35.0)	0.56	0.43	0.59	0.52	No operational issues.
Clayton Reservoir (21.6)	1.05	1.09	1.06	1.0	No operational issues.
Fleetwood Reservoir (13.6)	-	-	-	1.1	Cell 1 to be operational in 2026. Cell 2 was completed, disinfected, commissioned and put into service in November 2025.
Glenmore Tanks (1.0)	0.67	0.68	0.68	0.73	Tanks were cleaned and disinfected.
Grandview Reservoir (13.5)	0.84	0.71	0.76	0.77	No operational issues.
Greenwood Reservoir (8.8)	0.68	0.70	0.72	0.75	No operational issues.
Hellings Tank (4.3)	0.52	0.44	0.47	0.56	No operational issues.
Jericho Reservoir (20.0)	0.92	0.87	0.82	0.81	No operational issues.
Kennedy Reservoir (16.3)	0.60	0.57	0.55	0.57	No operational issues.
Kersland Reservoir (73.7)	0.61	0.53	0.56	0.67	No operational issues.
Little Mountain Reservoir (171.0)	0.66	0.65	0.65	0.70	No operational issues.
Maple Ridge Reservoir (20.0)	0.43	0.52	0.47	0.42	No operational issues.
Newton Reservoir (32.0)	0.64	0.45	0.48	0.54	No operational issues.
Pebble Hill Reservoir (42.2)	0.61	0.49	0.56	0.54	Cell 1 was removed from service in October due to the low demand season. Cell 2 began the year out of service; it was cleaned and disinfected before it was returned to service in June. Cell 3 no operational issues.
Prospect Reservoir (4.4)	0.69	0.70	0.72	0.77	Removed from service in October for seismic upgrades and remained out-of-service for the remainder of the year.
Sasamat Reservoir (26.0)	0.61	0.50	0.44	0.59	Conducted structural remediation repairs.
Sunnyside Reservoir (22.7)	0.78	0.68	0.76	0.86	Cell 1 had no operational issues. Cell 2 was removed from service in October for seismic upgrades and remained out of service for the remainder of the year.
Vancouver Heights Reservoir (43.0)	0.71	0.75	0.73	0.75	No operational issues.
Westburnco Reservoir (73.0)	0.65	0.55	0.67	0.53	No operational issues.
Whalley Reservoir (33.4)	0.65	0.72	0.74	0.62	Reservoir was cleaned and disinfected in March.

3.2. Microbiological Water Quality in GVWD Supplied Systems

For samples collected from GVWD supplied systems, the percent positive-per-month for total coliform bacteria from 2022-2025 is shown in Figure 10.

Figure 10: Bacteriological Quality of Water in GVWD Supplied Systems



The percentage of samples that were positive for total coliform bacteria continues to be low; the annual average in 2025 was 0.19%.

As per Part 1 of the DWPR, no sample should be positive for *E. coli*. In September a single sample from a GVWD supplied system was positive for *E. coli*. All subsequent follow-up resamples were negative.

As per Part 2 of the DWPR, not more than 10% of the samples in a 30-day period should be positive for total coliform bacteria when more than one sample is collected. While there were 44 samples with total coliforms detected out of over 22,200 samples, none of the GVWD supplied systems had more than 10% of samples positive for total coliforms in a 30-day period.

As per Part 3 of the DWPR, no sample should contain more than 10 total coliform bacteria per 100 mL; for samples from GVWD supplied systems, this requirement was met in 2025 with the following four exceptions: two in September, one in October and one in December. Follow-up samples did not detect any total coliforms.

Table 13 shows compliance with the bacteriological standards (3 parts) in the DWPR for samples taken within the distribution systems of the 21 water systems that are supplied with GVWD water.

Table 13: GVWD Connected Water Systems Water Quality Compared to the Provincial Bacteriological Standards

Month	Number of water systems that met Part 1 No sample should be positive for <i>E. coli</i>	Number of water systems that met Part 2 Not more than 10% of the samples in a 30-day period should be positive for total coliform bacteria	Number of water systems that met Part 3 No sample should contain more than 10 total coliform bacteria per 100 mL	Number of water systems that met all requirements
January	21	21	21	21
February	21	21	21	21
March	21	21	21	21
April	21	21	21	21
May	21	21	21	21
June	21	21	21	21
July	21	21	21	21
August	21	21	21	21
September	20	21	19	19
October	21	21	20	20
November	21	21	21	21
December	21	21	20	20

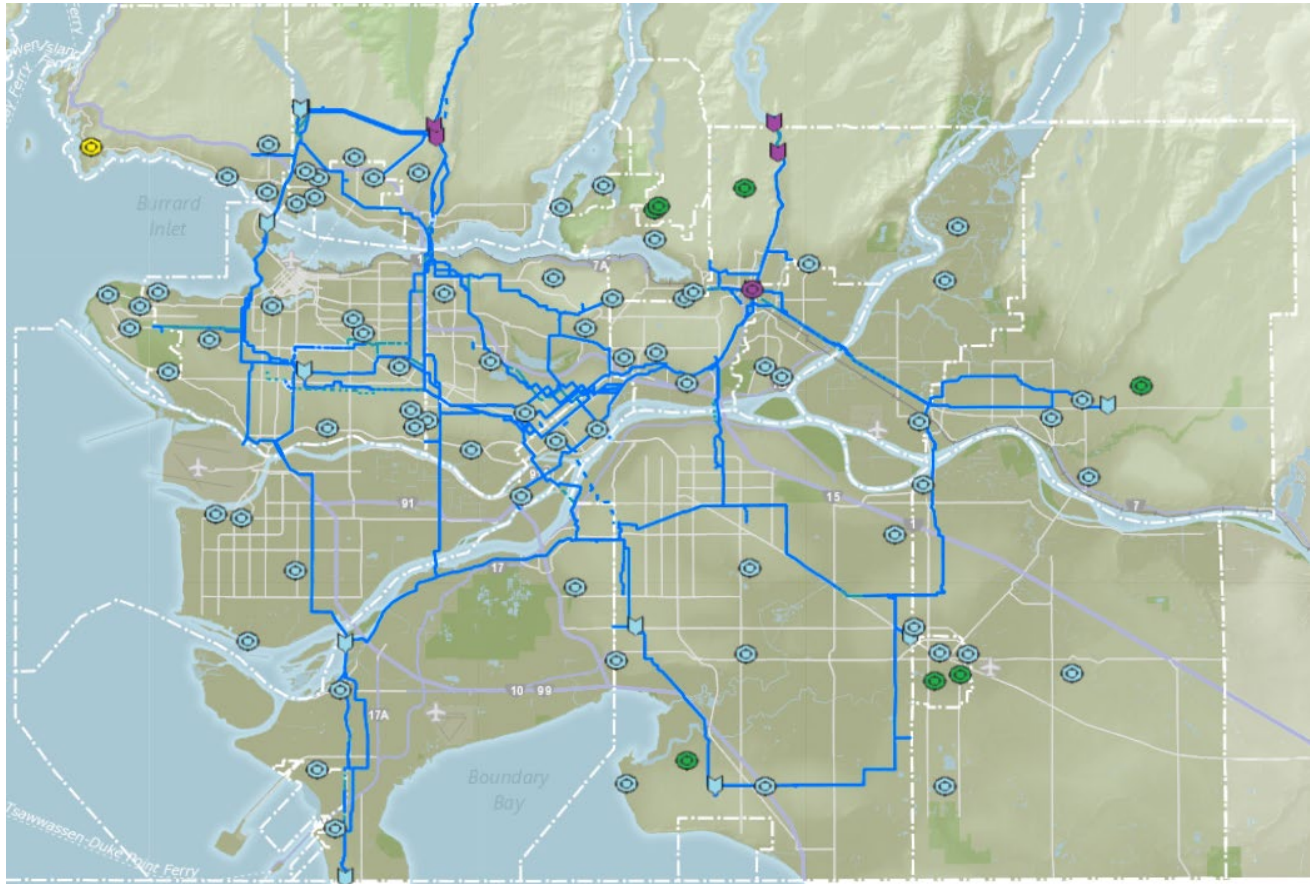
3.3. Disinfection By-Products in the Transmission and Distribution Systems

As treated water moves through the GVWD transmission system and into the distribution system infrastructure that is connected to the GVWD system, changes in water quality can occur. Reactions between chlorine (used to kill or inactivate harmful organisms in a process called disinfection) and dissolved natural organic matter can lead to the formation of a variety of disinfection by-products (DBPs). Health Canada recommends that utilities should make every effort to maintain concentrations of DBPs as low as reasonably achievable without compromising the effectiveness of disinfection.

There are two major classes of regulated DBPs: trihalomethanes and haloacetic acids. Total trihalomethane (TTHM) is the sum of four compounds: chloroform, bromodichloromethane, dibromochloromethane, and bromoform. Haloacetic Acid 5 (HAA5) is the sum of five compounds: dibromoacetic acid, dichloroacetic acid, monobromoacetic acid, monochloroacetic acid and trichloroacetic acid. Factors that affect DBP formation include: amount of chlorine added to water, reaction time, concentration and characteristics of dissolved organic materials (precursors), water temperature, and water pH.

The MAC in the GCDWQ for TTHMs is a locational yearly running average of 100 µg/L based on quarterly samples. A comparison of TTHM levels in the GVWD and GVWD supplied systems in 2025 is shown in Figure 11. All results were below the MAC of 100 µg/L. In 2025, the annual average TTHM results for GVWD water mains and GVWD supplied systems were 23 µg/L, and 32 µg/L, respectively.

Figure 11: Average Total Trihalomethane Concentrations



2025 Average GVWD System TTHM = 23 µg/L
 2025 Average GVWD Supplied Systems TTHM = 32 µg/L
 MAC for TTHM = 100 µg/L

TTHM Levels for GVWD System Sites

-  ≥ 0 and < 20
-  ≥ 20 and < 40
-  ≥ 40 and < 60
-  ≥ 60 and < 80
-  ≥ 80 and < 100
-  ≥ 100

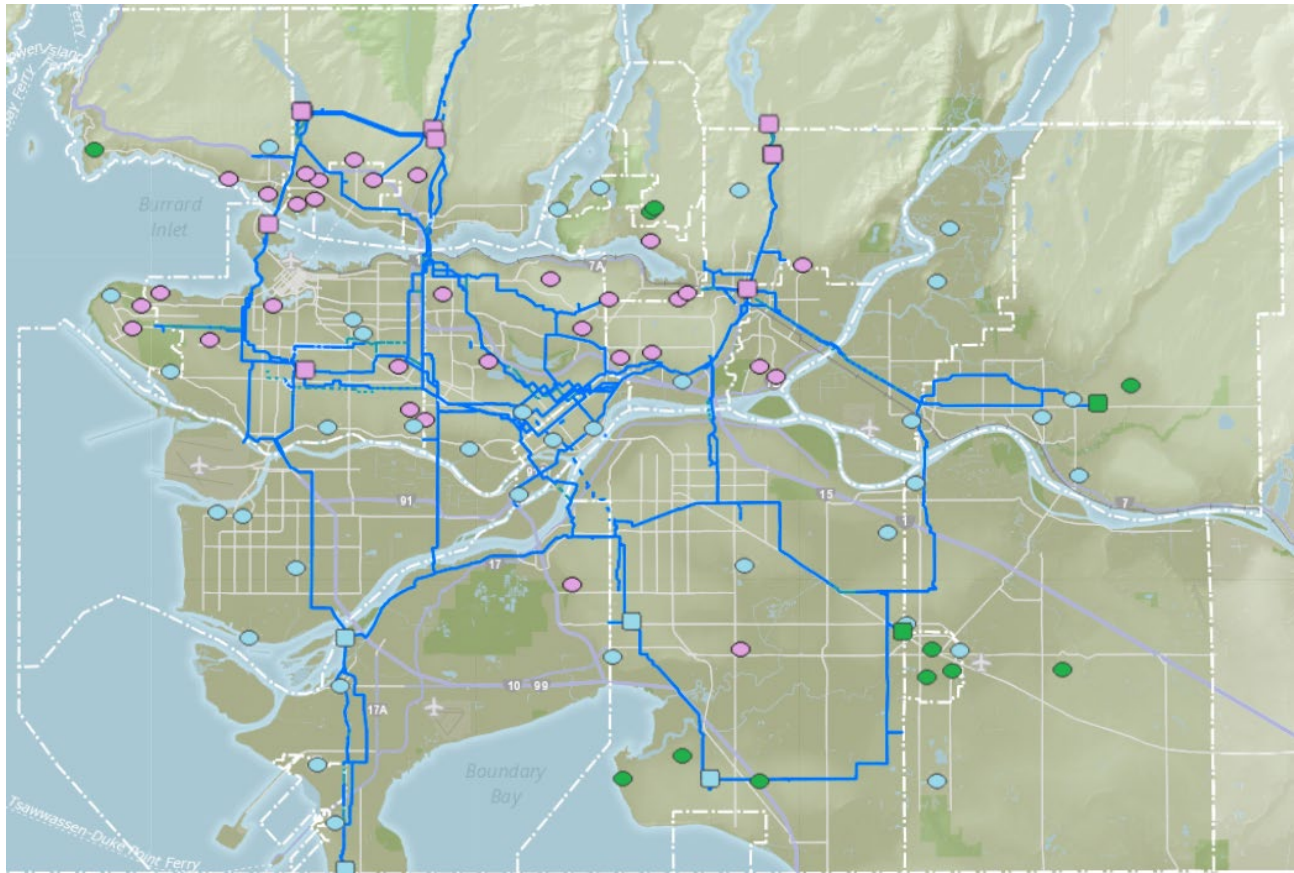
TTHM Levels at GVWD Supplied Systems Sites

-  ≥ 0 and < 20
-  ≥ 20 and < 40
-  ≥ 40 and < 60
-  ≥ 60 and < 80
-  ≥ 80 and < 100
-  ≥ 100

The other major regulated class of DBPs is HAA5. Comparison of HAA5 in the GVWD and GVWD supplied systems in 2025 is shown in Figure 12. In 2025, the annual average HAA5 results for GVWD water mains and GVWD supplied systems were 21 µg/L, and 24 µg/L, respectively. All results were below the MAC of 80 µg/L.

N-Nitrosodimethylamine (NDMA) is also a regulated DBP with a MAC of 40 ng/L. In 2025, NDMA was not detected in any treated water samples.

Figure 12: Average Haloacetic Acid 5 (HAA5) Concentrations



2025 Average GVWD System HAA5 = 21 µg/L

2025 Average GVWD Supplied Systems HAA5 = 24 µg/L

MAC for HAA5 = 80 µg/L

HAA5 Levels for GVWD System Sites

- ≥ 0 and < 20
- ≥ 20 and < 40
- ≥ 40 and < 60
- ≥ 60 and < 80
- ≥ 80 and < 100
- ≥ 100

HAA5 Levels at GVWD Supplied Systems Sites

- ≥ 0 and < 20
- ≥ 20 and < 40
- ≥ 40 and < 60
- ≥ 60 and < 80
- ≥ 80 and < 100
- ≥ 100

3.4. Polycyclic Aromatic Hydrocarbons in the Transmission System

In early September, the Capilano Main No. 7 was isolated for tie-in work in support of the Second Narrows Water Supply Tunnel project. Within two weeks of isolation, localized reports of drinking water odours within the District of North Vancouver began. Metro Vancouver was notified by the District of North Vancouver on October 2 and sampling was conducted on October 3 along with flushing.

Several locations were sampled and screened for a range of twenty-one PAH compounds. Results from Capilano Main No. 7 at Hunter Street confirmed the presence of low concentrations of fluoranthene (0.61 µg/L), fluorene (1.57 µg/L), naphthalene (3.79 µg/L), and quinoline (0.97 µg/L). The presence of naphthalene was consistent with the odours being reported. There are no Health Canada drinking water guidelines for the PAHs that were detected. The only PAH compound that has a GCDWQ limit is benzo[a]pyrene, which was not detected. At the time of the event, Vancouver Coastal Health was notified of the test results.

After the water main was returned to service and normal flow rates resumed, an additional round of sampling was conducted on October 10, which showed that PAH concentrations had dropped to near detection limits (total PAH concentration of 0.16 µg/L). At this time, reports of odours had ceased.

Additional data for routine PAH monitoring within select transmission mains are reported in Appendix 3.

4. Quality Assurance/Quality Control

Since 1994, the Metro Vancouver Microbiology Laboratory has participated in the BC Centre for Disease Control Public Health Laboratory's *Enhanced Water Quality Assurance Program* (EWQA) and has been approved by the Provincial Medical Health Officer to perform microbiological analysis of drinking water as required in the DWPR. An ongoing requirement of this approval is successful participation in the provincial *Clinical Microbiology Proficiency Testing Program*, or its equivalent. Representatives of the Approval Committee for Bacteriology Laboratories inspect the Metro Vancouver Microbiology Laboratory at the Lake City Operations Centre on a routine basis as part of the on-going approval process by the Provincial Health Officer. An audit inspection was planned for 2025 but was rescheduled to March 2026 by the EWQA audit team.

In addition to the approval process discussed above, the Metro Vancouver Laboratories are accredited by the Canadian Association for Laboratory Accreditation (CALA) for the analysis of specific parameters to the ISO/IEC 17025:2017. This is an international standard stipulates the general requirements for the competence of testing and calibration laboratories.

Representatives from CALA have assessed the Metro Vancouver Laboratories bi-annually since 1995. The most recent on-site audit successfully took place in October 2025, and the Metro Vancouver Laboratories were granted accreditation until 2028. The next bi-annual CALA assessment will take place in the fall of 2027. Metro Vancouver's full scope of accreditation is available on the CALA website (<https://cala.ca/>).

5. Results Summary

Source Water Quality

- The Capilano supply was in service for the entire year; this source's highest turbidity reading was 4.2 NTU.
- The Seymour supply was in service for the entire year; this source's highest turbidity reading was 6.0 NTU.
- The Coquitlam supply was in service for the entire year. The unfiltered Coquitlam source water was greater than 1.0 NTU for 5 days and never exceeded 5.0 NTU. The highest turbidity reading on the Coquitlam source water was 1.7 NTU.
- The microbiological quality of the three source reservoirs was excellent. The levels of bacteria and protozoa detected were low, and indicative of high-quality source water.
- Coquitlam source water quality met the bacteriological requirements for an unfiltered source supply as specified in the GCDWQ as well as British Columbia's *Source Drinking Water Quality Guidelines*.
- Results of the source water analyses for herbicides, pesticides, volatile organic compounds and radionuclides were all found to be below the recommended limits as listed in the GCDWQ.
- In mid-October, Metro Vancouver received widespread reports of earthy or musty odours in tap water across several municipalities, prompting testing for geosmin, a naturally occurring compound produced by some bacteria and algae. Sampling on October 27 confirmed the presence of geosmin in the Seymour source water and treated water from the SCFP. Operational adjustments that increased the Capilano supply reduced geosmin levels, and by November 5, treated water tested below detection limits. While unpleasant, geosmin is not harmful to health.

Water Treatment

- The SCFP performance, as measured by the quality of the delivered water, was excellent. The daily average turbidity of water leaving the clearwell to enter the GVWD transmission system was an average of 0.17 NTU.
- Turbidity levels for Individual Filter Effluent met the turbidity requirements of the GCDWQ and were never greater than 1.0 NTU.
- Filtration consistently removed iron, colour, and naturally occurring organics from the Capilano and Seymour source waters.
- There were no outages of disinfection treatment at the SCFP.
- At the CWTP there was a drop in liquid sodium hypochlorite solution dosing for 9 minutes resulting in lower chlorine residuals in Coquitlam Mains No. 2 and No. 3; they were briefly at 0.2 and 0.3 mg/L respectively, while turbidity remained low at 0.4 NTU. The UV system remained operational during the event.
- In March, there was a 30-minute outage of corrosion control at the CWTP, which resulted in a temporary low pH of 6.8 leaving the plant, as compared to the annual average pH of 8.4.
- The secondary disinfection stations boosted the residual chlorine when required.

Transmission and Distribution System Water Quality

- Bacteriological water quality was excellent in the GVWD transmission water mains and in-system storage reservoirs. The number of total coliforms detected in samples from both GVWD and water systems supplied with GVWD water is typically very low. More than 31,700 samples were collected and analyzed for GVWD and GVWD supplied systems, of which only one member jurisdiction sample was positive for *E. coli*. Repeat samples were taken, and no additional *E. coli* were found.
- The average concentration of TTHMs measured in the delivered water in the GVWD and water systems supplied with GVWD water were 23 µg/L and 32 µg/L, respectively. The average concentration for HAA5 measured in the delivered water in both the GVWD and water systems supplied with GVWD water were 21 µg/L and 24 µg/L, respectively. All DBP concentrations were below limits established in the GCDWQ.
- The isolation of Capilano Main No. 7, as part of the Second Narrows Water Supply Tunnel project tie-in work, caused some water to stagnate, which was followed by localized drinking water odour complaints. Testing confirmed low levels of four PAHs, including naphthalene. Detection of naphthalene is considered an aesthetic issue as there are no health-based drinking water guidelines for PAHs, except for benzo[a]pyrene, which was not detected. After flushing and returning the water main to regular service, odours dissipated.

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Appendix A — Water Sampling Frequency

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Water Type	Parameter	Minimum Frequency
Untreated, Source Water	Total coliform and <i>E. coli</i>	Daily
	HPC	Daily
	pH	Daily
	Turbidity	Daily
	<i>Giardia</i> and <i>Cryptosporidium</i>	Monthly
	Alkalinity, Ammonia, colour, iron, organic carbon	Weekly
	Calcium, chloride, fluoride, hardness, magnesium, manganese, nitrate, nitrite, phosphorus, sulphate	Monthly
	Aluminum, residue, silica, sodium	Bi-monthly
	TTHM, HAA5	Quarterly
	Antimony, arsenic, barium, boron, cadmium, chromium, copper, cyanide, lead, mercury, nickel, phenols, potassium, selenium, silver, uranium, zinc	Semi-annually
	Pesticides and herbicides	Annually
	PAHs, BTEX	Annually
	PFOS, PFOA, PFAS (sum of 25 compounds)	Annually
	VOCs	Annually
	Radionuclides	Annually
Treated Water before Transmission	Total coliform and <i>E. coli</i>	Daily
	Free chlorine, pH, temperature	Daily
	Turbidity	Daily
	Alkalinity, Ammonia, colour, conductivity, iron, organic carbon, aluminum at SCFP only	Weekly
	Aluminum, sodium, total and suspended solids (residue)	Bi-Monthly
	TTHM, HAA5	Quarterly at selected sites
	Antimony, arsenic, barium, boron, cadmium, chromium, copper, cyanide, lead, mercury, nickel, phenols, selenium, silver, zinc	Semi-annually
GVWD Water Mains	Total coliform and <i>E. coli</i> , HPC	Weekly
	Free chlorine, pH, temperature	Weekly
	TTHM, HAA5	Quarterly at selected sites
	PAHs, BTEX, vinyl chloride	Semi-annually at selected sites
GVWD Reservoirs	Total coliform and <i>E. coli</i> , HPC	Weekly
	Turbidity	Weekly
GVWD Supplied Distribution Systems	Total coliform and <i>E. coli</i> , HPC	Weekly
	Free chlorine, temperature	Weekly
	Turbidity	Weekly
	TTHM, HAA5, pH	Quarterly at selected sites
	Aluminum, antimony, arsenic, barium, boron, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, mercury, selenium, silver, sodium, zinc, vinyl chloride	Semi-annually at selected sites

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Appendix B — Metro Vancouver Chemical and Physical Analysis Summaries

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Metro Vancouver Physical and Chemical Analysis of Water Supply 2025 – Capilano Water System

Analyte	Untreated ¹	Treated ²			Canadian Guideline	
	Average	Average	Range	Days Exceeded	Limit ³	Reason Established
Alkalinity as CaCO ₃ (mg/L)	3.1	21	17-23	N/A	None	N/A
Aluminum Dissolved (µg/L)	64	25	17-37	N/A	None	N/A
Aluminum Total (µg/L)	109	28	18-50	0	2,900/100	Health/Operational
Antimony Total (µg/L)	<0.5	<0.5	<0.5	0	6	Health
Arsenic Total (µg/L)	<0.5	<0.5	<0.5	0	10 (ALARA)	Health
Barium Total (µg/L)	2.6	3.0	2.6 - 3.4	0	2,000	Health
Boron Total (µg/L)	<10	<10	<10	0	5,000	Health
Bromate (µg/L)	<10	<10	<10	0	10	Health
Bromide (µg/L)	<10	<10	<10	N/A	None	N/A
Cadmium Total (µg/L)	<0.2	<0.2	<0.2	0	7	Health
Calcium Total (µg/L)	1,180	7,910	7,180 - 8,880	N/A	None	N/A
Carbon Organic - Dissolved (mg/L)	1.7	0.7	0.5-1.1	N/A	None	N/A
Carbon Organic - Total (mg/L)	1.8	0.7	0.5-1.1	N/A	None	N/A
Chlorate (µg/L)	<10	42	20-110	0	1,000	Health
Chloride (mg/L)	<0.6	2.7	2.4 - 3.5	0	≤250	Aesthetic
Chromium Total (µg/L)	<0.07	<0.05	<0.05 - 0.06	0	50	Health
Cobalt Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
Colour - Apparent (ACU)	14	<2	<2-2	N/A	None	N/A
Colour - True (TCU)	10	<1	<1 - 1	0	≤15	Aesthetic
Conductivity (µmhos/cm)	11	52	47 - 58	N/A	None	N/A
Copper Total (µg/L)	3.0	<0.5	<0.5	0	2,000/1,000	Health/Aesthetic
Cyanide Total (mg/L)	<0.002	<0.002	<0.002	0	0.2	Health
Cyanobacterial Toxins – Microcystin – LR (µg/L)	<0.20	N/A	N/A	0	1.5	Health
1,4-Dioxane (µg/L)	<1	N/A	N/A	N/A	50	Health
Formaldehyde (µg/L)	N/A ⁴	N/A ⁴	N/A ⁴	N/A ⁴	None	N/A
Fluoride (mg/L)	<0.05	<0.05	<0.05	0	1.5	Health
Haloacetic Acid 5 (HAA5) (µg/L)	<3	16	10 - 20	0	80 (ALARA)	Health
Hardness as CaCO ₃ (mg/L)	3.6	20.5	18.8 - 22.2	N/A	None	N/A
Iron Dissolved (µg/L)	30	<5	<5	N/A	None	N/A
Iron Total (µg/L)	89	<8	<5-15	0	≤100	Aesthetic
Lead Total (µg/L)	<0.5	<0.5	<0.5	0	5 (ALARA)	Health
Magnesium Total (µg/L)	164	216	157 - 296	N/A	None	N/A
Manganese Dissolved (µg/L)	3.7	2.0	0.9 - 4.1	N/A	None	N/A
Manganese Total (µg/L)	4.6	4.2	2.0 - 10.2	0	120/20	Health/Aesthetic
Mercury Total (µg/L)	<0.05	<0.05	<0.05	0	1	Health
Molybdenum Total (µg/L)	<0.5	<0.5	<0.5	N/A	88 ⁵	N/A
Nickel Total (µg/L)	<0.5	<0.5	<0.5	N/A	80 ⁵	N/A
Nitrilotriacetic acid (NTA) (µg/L)	<50	N/A	N/A	N/A	400	Health
Nitrogen - Ammonia as N (mg/L)	<0.02	<0.02	<0.02	N/A	None	N/A
Nitrogen - Nitrate as N (mg/L)	0.07	0.06	0.02 - 0.09	0	10	Health
Nitrogen - Nitrite as N (mg/L)	<0.01	<0.01	<0.01	0	1	Health
N-Nitrosodimethylamine (NDMA) (ng/L)	<1.9	N/A	N/A	N/A	40	Health
pH (pH units)	6.6	8.3	7.9 - 8.5	0	7.0 - 10.5	Aesthetic
Phenol (mg/L)	<0.004	<0.004	<0.002 - <0.005	N/A	None	N/A
Potassium Total (µg/L)	156	154	140 - 166	N/A	None	N/A
Residue Total Dissolved (TDS) (mg/L)	14	32	28 - 37	0	≤500	Aesthetic
Selenium Total (µg/L)	<0.5	<0.5	<0.5	0	10 ⁵	Health
Silica as SiO ₂ (mg/L)	3.5	3.5	3.2 - 3.8	N/A	None	N/A
Silver Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
Sodium Total (µg/L)	575	1,660	1,340 - 2,120	0	≤200,000	Aesthetic
Strontium (µg/L)	5.7	21.5	20.5 - 22.4	0	7000	Health
Total Trihalomethanes (TTHM) (µg/L)	<4	22.5	19 - 26	0	100	Health
Turbidity (NTU)	0.93	0.15	0.07 - 0.40	N/A	None ⁶	N/A
Uranium Total (µg/L)	<0.5	<0.5	<0.5	0	20	Health
UV Absorbance 254 nm (Abs/cm)	0.067	0.011	0.007 - 0.015	N/A	None	N/A
Zinc Total (µg/L)	<3	<3	<3	0	≤5,000	Aesthetic

¹Untreated water is sampled prior to the Seymour Capilano Filtration Plant.

²Treated water is sampled prior to entering the Capilano transmission system.

³Limits are taken from *the Guidelines for Canadian Drinking Water Quality*, unless otherwise indicated.

⁴Not applicable (N/A) because formaldehyde is a by-product of disinfection with ozone and ozone is not used at SCFP.

⁵A more strict guideline exists in the *Source Drinking Water Quality Guidelines*, BC Ministry of Environment & Climate Change Strategy (2020).

⁶*Guidelines for Canadian Drinking Water Quality* recommends that water entering the distribution system have turbidity levels of 1.0 NTU or less.

Metro Vancouver Physical and Chemical Analysis of Water Supply

2025 – Seymour Water System

Analyte	Untreated ¹	Treated ²			Canadian Guideline	
	Average	Average	Range	Days Exceeded	Limit ³	Reason Established
Alkalinity as CaCO ₃ (mg/L)	4.1	20	17 - 23	N/A	None	N/A
Aluminum Dissolved (µg/L)	49	25	15 - 37	N/A	None	N/A
Aluminum Total (µg/L)	76	28	16 - 48	0	2,900/100	Health/Operational
Antimony Total (µg/L)	<0.5	<0.5	<0.5	0	6	Health
Arsenic Total (µg/L)	<0.5	<0.5	<0.5	0	10 (ALARA)	Health
Barium Total (µg/L)	3.4	2.8	2.4 - 3.0	0	2,000	Health
Boron Total (µg/L)	<10	<10	<10	0	5,000	Health
Bromate (µg/L)	<10	<10	<10	0	10	Health
Bromide (µg/L)	<10	<10	<10	N/A	None	N/A
Cadmium Total (µg/L)	<0.2	<0.2	<0.2	0	7	Health
Calcium Total (µg/L)	1,670	7,810	6,930 - 8,760	N/A	None	N/A
Carbon Organic - Dissolved (mg/L)	1.6	0.7	0.5 - 1.0	N/A	None	N/A
Carbon Organic - Total (mg/L)	1.6	0.7	0.5 - 1.0	N/A	None	N/A
Chlorate (µg/L)	<10	43	20 - 110	0	1,000	Health
Chloride (mg/L)	<0.5	2.8	2.3 - 3.5	0	≤250	Aesthetic
Chromium Total (µg/L)	<0.05	<0.05	<0.05	0	50	Health
Cobalt Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
Colour - Apparent (ACU)	14	<2	<2 - 3	N/A	None	N/A
Colour - True (TCU)	9	<1	<1 - 1	0	≤15	Aesthetic
Conductivity (µmhos/cm)	14	52	47 - 56	N/A	None	N/A
Copper Total (µg/L)	24.9	<0.5	<0.5	0	2,000/1,000	Health/Aesthetic
Cyanide Total (mg/L)	<0.002	<0.002	<0.002	0	0.2	Health
Cyanobacterial Toxins – Microcystin – LR (µg/L)	<0.20	N/A	N/A	0	1.5	Health
1,4-Dioxane (µg/L)	<1	<1	<1	0	50	Health
Formaldehyde (µg/L)	N/A ⁴	N/A ⁴	N/A ⁴	N/A ⁴	None	N/A
Fluoride (mg/L)	<0.05	<0.05	<0.05	0	1.5	Health
Haloacetic Acid 5 (HAA5) (µg/L)	<3	12	9 - 14	0	80 (ALARA)	Health
Hardness as CaCO ₃ (mg/L)	4.8	20.2	18.1 - 22.1	N/A	None	N/A
Iron Dissolved (µg/L)	59	<5	<5	N/A	None	N/A
Iron Total (µg/L)	147	<9	<5 - 20	0	≤100	Aesthetic
Lead Total (µg/L)	<0.5	<0.5	<0.5	0	5 (ALARA)	Health
Magnesium Total (µg/L)	147	213	154 - 302	N/A	None	N/A
Manganese Dissolved (µg/L)	4.1	2.6	0.9 - 5.6	N/A	None	N/A
Manganese Total (µg/L)	5.8	4.6	2.4 - 10.6	0	120/20	Health/Aesthetic
Mercury Total (µg/L)	<0.05	<0.05	<0.05	0	1	Health
Molybdenum Total (µg/L)	<0.5	<0.5	<0.5	N/A	88 ⁵	N/A
Nickel Total (µg/L)	<0.5	<0.5	<0.5	N/A	80 ⁵	N/A
Nitrilotriacetic acid (NTA) (µg/L)	<50	<50	<50	0	400	Health
Nitrogen - Ammonia as N (mg/L)	<0.02	<0.02	<0.02	N/A	None	N/A
Nitrogen - Nitrate as N (mg/L)	0.05	0.06	0.02 - 0.09	0	10	Health
Nitrogen - Nitrite as N (mg/L)	<0.01	<0.01	<0.01	0	1	Health
N-Nitrosodimethylamine (NDMA) (ng/L)	<1.9	<1.9	<1.9	0	40	Health
pH (pH units)	6.6	8.1	7.8 - 8.5	0	7.0 - 10.5	Aesthetic
Phenol (mg/L)	<0.004	<0.004	<0.002 - <0.005	N/A	None	N/A
Potassium Total (µg/L)	156	149	127 - 165	N/A	None	N/A
Residue Total Dissolved (TDS) (mg/L)	15	32	29 - 37	0	≤500	Aesthetic
Selenium Total (µg/L)	<0.5	<0.5	<0.5	0	10 ⁵	Health
Silica as SiO ₂ (mg/L)	3.4	3.5	3.1 - 3.8	N/A	None	N/A
Silver Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
Sodium Total (µg/L)	554	1650	1,310 - 2,100	0	≤200,000	Aesthetic
Strontium (µg/L)	7.2	20.4	18.6 - 21.8	0	7000	Health
Total Trihalomethanes (TTHM) (µg/L)	<4	18.5	15 - 20	0	100	Health
Turbidity (NTU)	0.56	0.17	0.08 - 0.52	N/A	None ⁶	N/A
Uranium Total (µg/L)	<0.5	<0.5	<0.5	0	20	Health
UV Absorbance 254 nm (Abs/cm)	0.061	0.011	0.007 - 0.016	N/A	None	N/A
Zinc Total (µg/L)	<3	<3	<3	0	≤5,000	Aesthetic

¹Untreated water is sampled prior to the Seymour Capilano Filtration Plant.

²Treated water is sampled prior to entering the Seymour transmission system.

³Limits are taken from *the Guidelines for Canadian Drinking Water Quality*, unless otherwise indicated.

⁴Not applicable (N/A) because formaldehyde is a by-product of disinfection with ozone and ozone is not used at SCFP.

⁵A more strict guideline exists in the *Source Drinking Water Quality Guidelines*, BC Ministry of Environment & Climate Change Strategy (2020).

⁶*Guidelines for Canadian Drinking Water Quality* recommends that water entering the distribution system have turbidity levels of 1.0 NTU or less.

Metro Vancouver Physical and Chemical Analysis of Water Supply 2025 – Coquitlam Water System

Analyte	Untreated ¹	Treated ²			Canadian Guideline	
	Average	Average	Range	Days Exceeded	Limit ³	Reason Established
Alkalinity as CaCO ₃ (mg/L)	1.9	20	9.5 - 23	N/A	None	N/A
Aluminum Dissolved (µg/L)	55	61	44 - 74	N/A	None	N/A
Aluminum Total (µg/L)	74	75	58 - 85	0	2,900/100	Health/Operational
Antimony Total (µg/L)	<0.5	<0.5	<0.5	0	6	Health
Arsenic Total (µg/L)	<0.5	<0.5	<0.5	0	10 (ALARA)	Health
Barium Total (µg/L)	2.6	2.4	2.2 - 2.7	0	2,000	Health
Boron Total (µg/L)	<10	<10	<10	0	5,000	Health
Bromate (µg/L)	<10	<10	<10	0	10	Health
Bromide (µg/L)	<10	<10	<10	N/A	None	N/A
Cadmium Total (µg/L)	<0.2	<0.2	<0.2	0	7	Health
Calcium Total (µg/L)	828	824	738 - 914	N/A	None	N/A
Carbon Organic - Dissolved (mg/L)	1.6	1.6	1.3 - 2.1	N/A	None	N/A
Carbon Organic - Total (mg/L)	1.7	1.6	1.3 - 2.1	N/A	None	N/A
Chlorate (µg/L)	<10	110	45 - 160	0	1,000	Health
Chloride (mg/L)	<0.5	2.3	2.0 - 2.7	0	≤250	Aesthetic
Chromium Total (µg/L)	<0.05	<0.05	<0.05	0	50	Health
Cobalt Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
Colour - Apparent (ACU)	12	<2	<2 - 2	N/A	None	N/A
Colour - True (TCU)	8	<1	<1 - 2	0	≤15	Aesthetic
Conductivity (µmhos/cm)	8	48	31 - 53	N/A	None	N/A
Copper Total (µg/L)	<0.5	<0.5	<0.5	0	2,000/1,000	Health/Aesthetic
Cyanide Total (mg/L)	<0.002	<0.002	<0.002	0	0.2	Health
Cyanobacterial Toxins – Microcystin – LR (µg/L)	<0.20	N/A	N/A	0	1.5	Health
1,4-Dioxane (µg/L)	<1	<1	<1	0	50	Health
Formaldehyde (µg/L)	N/A	19	19	N/A	None	N/A
Fluoride (mg/L)	<0.05	<0.05	<0.05	0	1.5	Health
Haloacetic Acid 5 (HAA5) (µg/L)	<3	7	5 - 10	0	80 (ALARA)	Health
Hardness as CaCO ₃ (mg/L)	2.4	2.4	2.2 - 2.7	N/A	None	N/A
Iron Dissolved (µg/L)	15	17	10 - 29	N/A	None	N/A
Iron Total (µg/L)	44	43	28 - 97	0	≤100	Aesthetic
Lead Total (µg/L)	<0.5	<0.5	<0.5	0	5 (ALARA)	Health
Magnesium Total (µg/L)	92	92	80 - 102	N/A	None	N/A
Manganese Dissolved (µg/L)	3.4	2.4	0.8 - 3.5	N/A	None	N/A
Manganese Total (µg/L)	3.8	3.2	2.2 - 4.2	0	120/20	Health/Aesthetic
Mercury Total (µg/L)	<0.05	<0.05	<0.05	0	1	Health
Molybdenum Total (µg/L)	<0.5	<0.5	<0.5	N/A	88 ⁴	N/A
Nickel Total (µg/L)	<0.5	<0.5	<0.5	N/A	80 ⁴	N/A
Nitrilotriacetic acid (NTA) (µg/L)	<50	<50	<50	0	400	Health
Nitrogen - Ammonia as N (mg/L)	<0.02	<0.02	<0.02	N/A	None	N/A
Nitrogen - Nitrate as N (mg/L)	0.07	0.07	0.05 - 0.09	0	10	Health
Nitrogen - Nitrite as N (mg/L)	<0.01	<0.01	<0.01	0	1	Health
N-Nitrosodimethylamine (NDMA) (ng/L)	<1.9	<1.9	<1.9	0	40	Health
pH (pH units)	6.3	8.3	7.7 - 9.2	0	7.0 - 10.5	Aesthetic
Phenol (mg/L)	<0.004	<0.004	<0.002 - <0.005	N/A	None	N/A
Potassium Total (µg/L)	115	114	104 - 122	N/A	None	N/A
Residue Total Dissolved (TDS) (mg/L)	11	33	30 - 35	0	≤500	Aesthetic
Selenium Total (µg/L)	<0.5	<0.5	<0.5	0	10 ⁴	Health
Silica as SiO ₂ (mg/L)	2.6	2.6	2.5 - 2.8	N/A	None	N/A
Silver Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
Sodium Total (µg/L)	463	10,100	8,910 - 11,200	0	≤200,000	Aesthetic
Strontium (µg/L)	3.8	3.8	3.5 - 4.0	0	7000	Health
Total Trihalomethanes (TTHM) (µg/L)	<4	5.5	4 - 7	0	100	Health
Turbidity (NTU)	0.39	0.33	0.13 - 2.0	N/A	None ⁵	N/A
Uranium Total (µg/L)	<0.5	<0.5	<0.5	0	20	Health
UV Absorbance 254 nm (Abs/cm)	0.060	0.018	0.015 - 0.031	N/A	None	N/A
Zinc Total (µg/L)	<3	<3	<3	0	≤5,000	Aesthetic

¹Untreated water is sampled from the source intake.

²Treated water is sampled prior to entering the Coquitlam transmission system.

³Limits are taken from the *Guidelines for Canadian Drinking Water Quality*, unless otherwise indicated.

⁴A more strict guideline exists in the *Source Drinking Water Quality Guidelines*, BC Ministry of Environment & Climate Change Strategy (2020).

⁵*Guidelines for Canadian Drinking Water Quality* recommends that water entering the distribution system have turbidity levels of 1.0 NTU or less.

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Appendix C — Analysis of Water for Organic Components and Radionuclides

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Analysis of Source Waters for Herbicides, Pesticides, and other Organic Compounds

Analyte	Capilano (µg/L) June 25	Seymour (µg/L) June 25	Coquitlam (µg/L) June 25	MAC (µg/L)	AO (µg/L)
Herbicides					
2,4-Dichlorophenoxyacetic acid (2,4-D)	<1.0	<1.0	<1.0	100	None
Bromoxynil	<0.50	<0.50	<0.50	30	None
Dicamba	<1.0	<1.0	<1.0	110	None
Diclofop-methyl	<0.90	<0.90	<0.90	None	None
Diquat	<7.0	<7.0	<7.0	50	None
Diuron	<10	<10	<10	None	None
Glyphosate	<10	<10	<10	280	None
4-Chloro-2-methylphenoxyacetic acid (MCPA)	<10	<10	<10	350	None
Metribuzin (Sencor)	<5.0	<5.0	<5.0	80	None
Paraquat	<1.0	<1.0	<1.0	None	None
Picloram	<5.0	<5.0	<5.0	None	None
Pesticides					
Atrazine	<0.50	<0.50	<0.50	5	None
Carbaryl	<5.0	<5.0	<5.0	None	None
Carbofuran	<5.0	<5.0	<5.0	None	None
Chlorpyrifos (Dursban)	<1.0	<1.0	<1.0	90	None
Diazinon	<1.0	<1.0	<1.0	None	None
Dimethoate	<2.5	<2.5	<2.5	20	None
Guthion (Azinphos-methyl)	<2.0	<2.0	<2.0	None	None
Malathion	<5.0	<5.0	<5.0	290	None
Metolachlor	<0.50	<0.50	<0.50	None	None
Omethoate ¹	<0.50	<0.50	<0.50	20	None
Phorate (Thimet)	<0.50	<0.50	<0.50	None	None
Simazine	<1.0	<1.0	<1.0	None	None
Terbufos	<0.50	<0.50	<0.50	None	None
Trifluralin	<1.0	<1.0	<1.0	None	None
Other Organic Compounds					
Phenolics					
Monochlorophenol ²	<0.090	<0.090	<0.090	None ³	0.1 ³
2,4-dichlorophenol	<0.25	<0.25	<0.25	900 ³	None ³
2,4,6-trichlorophenol	<0.50	<0.50	<0.50	5	≤2
2,3,4,6-tetrachlorophenol	<0.50	<0.50	<0.50	100 ³	1 ³
Pentachlorophenol	<0.50	<0.50	<0.50	60	≤30

MAC = Maximum Acceptable Concentration; AO = Aesthetic Objective (values from Health Canada, unless otherwise indicated).

¹Sampled on November 24, 2025.

²Sampled on October 21, 2025.

³Source *Drinking Water Quality Guidelines*, BC Ministry of Environment & Climate Change Strategy (2020).

Analysis of Source Waters for Herbicides, Pesticides, and other Organic Compounds, *Continued*

Analyte	Capilano (µg/L) June 25	Seymour (µg/L) June 25	Coquitlam (µg/L) June 25	MAC (µg/L)	AO (µg/L)
Volatile Organics					
1,1-dichloroethene	<0.50	<0.50	<0.50	None	None
1,2-dichlorobenzene	<0.50	<0.50	<0.50	None	None
1,2-dichloroethane	<0.50	<0.50	<0.50	5	None
1,4-dichlorobenzene	<0.50	<0.50	<0.50	5	≤1
Benzene	<0.40	<0.40	<0.40	5	None
Carbon tetrachloride	<0.50	<0.50	<0.50	2	None
Chlorobenzene	<0.50	<0.50	<0.50	None	None
Dibromomethane	<0.90	<0.90	<0.90	None	None
Dichloromethane	<2.0	<2.0	<2.0	50	None
Ethylbenzene	<0.40	<0.40	<0.40	140	1.6
Methyl-tert-butyl ether	<4.0	<4.0	<4.0	None	≤15
Tetrachloroethene	<0.50	<0.50	<0.50	10	None
Toluene	<0.40	<0.40	<0.40	60	24
Trichloroethene	<0.50	<0.50	<0.50	5	None
Vinyl chloride	<0.50	<0.50	<0.50	2 (ALARA)	None
m & p-Xylene	<0.40	<0.40	<0.40	None	None
o-Xylene	<0.40	<0.40	<0.40	None	None
Xylenes (Total)	<0.40	<0.40	<0.40	90	20
Low Volatility Organics					
Diisopropanolamine (mg/L) ¹	<0.030	<0.030	<0.030	3.5 ²	None
Sulfolane (µg/L) ¹	<1.0	<1.0	<1.0	90 ²	None

MAC = Maximum Acceptable Concentration; AO = Aesthetic Objective (values from Health Canada, unless otherwise indicated).

¹Sampled on October 21, 2025.

²Source *Drinking Water Quality Guidelines*, BC Ministry of Environment & Climate Change Strategy (2020).

Analysis of Select GVWD Water Mains for BTEX

Analyte	Maple Ridge Main		Barnston Island Main at Willoughby Pump Station		Jericho Clayton Main		South Burnaby Main No. 2		MAC	AO
	(µg/L)		(µg/L)		(µg/L)		(µg/L)		(µg/L)	(µg/L)
	April 7	Nov 24	April 8	Nov 25	April 8	Nov 25	April 10	Nov 26		
Benzene	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5	None
Ethyl Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	140	1.6
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	60	24
m & p-Xylene	<1	<1	<1	<1	<1	<1	<1	<1	None	None
o-Xylene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	None	None
Total Xylenes	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	90	20
Total BTEX	<1.4	<1.4	0.5	<1.4	<1.4	<1.4	<1.4	<1.4	None	None

MAC = Maximum Acceptable Concentration; AO = Aesthetic Objective (values from Health Canada).

Analysis of Source Water for Polycyclic Aromatic Hydrocarbons (PAHs)¹

Analyte	Capilano (µg/L)			Seymour (µg/L)			Coquitlam (µg/L)		
	April 8	June 25	Nov 24	April 10	June 25	Nov 24	April 8	June 25	Nov 24
1-Methylnaphthalene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-Methylnaphthalene	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Acenaphthylene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Acridine	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Anthracene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo[a]anthracene ²	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo[a]pyrene ²	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[b+j]fluoranthene ²	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Benzo[g,h,i]perylene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo[k]fluoranthene ²	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chrysene ²	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dibenz[a,h]anthracene ²	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Fluoranthene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Indeno[1,2,3-cd]pyrene ²	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Naphthalene	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Pyrene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Quinoline	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Total PAHs	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

¹Source Drinking Water Quality Guidelines, BC Ministry of Environment & Climate Change Strategy (2020).

²Representing total carcinogenic polycyclic aromatic hydrocarbons (PAH) as B[a]P total potency.

Analysis of Select GVWD Mains for Polycyclic Aromatic Hydrocarbons (PAHs)

Analyte	Coquitlam Main No. 2		Westburnco Reservoir		Barnston Island Main		Annacis Main No. 4		Whalley - Kennedy Link Main		Haney Main No. 2		36 Ave. Main	
	(µg/L)		(µg/L)		(µg/L)		(µg/L)		(µg/L)		(µg/L)		(µg/L)	
	Apr 09	Nov 26	April 08	Nov 26	April 08	Nov 25	Apr 09	Nov 25	Apr 09	Nov 25	April 08	Nov 24	Apr 09	Nov 24
1-Methylnaphthalene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-Methylnaphthalene	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Acenaphthylene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Acridine	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Anthracene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benz[a]anthracene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo[a]pyrene ¹	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo[b+j]fluoranthene	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Benzo[g,h,i]perylene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo[k]fluoranthene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chrysene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dibenz[a,h]anthracene	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Fluoranthene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Indeno[1,2,3-c,d]pyrene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Naphthalene	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Pyrene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Quinoline	<0.020	<0.020	0.027	0.052	<0.020	0.022	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.13
Total PAHs	<0.10	<0.10	0.027	0.052	<0.10	0.022	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.13

¹Benzo[a]pyrene is the only PAH compound that has a GCDWQ limit. Maximum Acceptable Concentration of Benzo[a]pyrene is 0.04 µg/L.

Analysis of Source Water for Radionuclides (June 25, 2025)

Analyte	Capilano (Bq/L)	Seymour (Bq/L)	Coquitlam (Bq/L)	MAC (Bq/L)
Gross Alpha	<0.10	<0.10	<0.10	0.5 ¹
Gross Beta	<0.10	<0.10	<0.10	1 ¹
Cesium-134	<1	<1	<1	None
Cesium-137	<1	<1	<1	None
Iodine-131	<1	<1	<1	None
Lead-210	<0.10	<0.10	<0.10	2
Manganese-54	<1	<1	<1	None
Radium-226	<0.010	<0.010	<0.010	5
Radon-222	<10	<10	<10	None
Strontium-90	<0.10	<0.10	<0.10	None
Tritium	<20	<20	<20	None
Zinc-65	<1	<1	<1	None

¹Health Canada recommends that drinking water samples should initially be screened against a gross alpha radiation level of 0.5 Bq/L (becquerel/litre) and a gross beta level of 1 Bq/L. Individual radionuclide analysis is only necessary when one (or both) of these are exceeded.

Analysis of Source¹ and Treated Water² for Per- and Polyfluoroalkyl substances (PFAS)

Analyte	Unit s	Capilano				Seymour				Coquitlam			
		Untreated		Treated		Untreated		Treated		Untreated		Treated	
		June 25	Oct 21	June 25	Oct 21	June 25	Oct 21	June 25	Oct 21	June 25	Oct 21	June 25	Oct 21
11CL-PF3OUds	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
4:2 FTS	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
6:2 FTS	ng/L	<4.0	<1	<4.0	<1	<4.0	<1	<4.0	<1	<4.0	<1	<4.0	<1
8:2 FTS	ng/L	<4.0	<1	<4.0	<1	<4.0	<1	<4.0	<1	<4.0	<1	<4.0	<1
9CI-PF3ONS	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
ADONA	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
HFPO-DA	ng/L	<4.0	<1	<4.0	<1	<4.0	<1	<4.0	1	<4.0	<1	<4.0	<1
NFDHA	ng/L	<4.0	<1	<4.0	<1	<4.0	<1	<4.0	2	<4.0	<1	<4.0	<1
PFBA	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	3	<2.0	<1	<2.0	<1
PFBS	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
PFDA	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
PFDoA	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
PFEESA	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
PFHpA	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
PFHpS	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
PFHxA	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
PFHxS	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
PFMBA	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	2	<2.0	<1	<2.0	<1
PFMPA	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	2	<2.0	<1	<2.0	<1
PFNA	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
PFOA ¹	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
PFOS ¹	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
PFPeA	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	2	<2.0	<1	<2.0	<1
PFPeS	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
PFUnA	ng/L	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1	<2.0	<1
Total sum of 25 specific PFAS compounds	ng/L	N/A ⁴	N/A ⁴	Zero ³	Zero ³	N/A ⁴	N/A ⁴	Zero ³	10	N/A ⁴	N/A ⁴	Zero ³	Zero ³

Note: Detection limits are different, depending on sampling date, as analyses were conducted by different laboratories.

¹For PFOA and PFOS, untreated values are compared against the *Source Drinking Water Quality Guidelines*, BC Ministry of Environment & Climate Change Strategy (2020) of 200 ng and 600 ng, respectively.

²To reduce exposure from drinking water, Health Canada established a drinking water objective of 30 ng/L, which is considered the sum of the concentrations of the 25 specific PFAS listed.

³When calculating the sum of PFAS for Health Canada's drinking water objective (2024), a result of "non-detect" is considered to have a value of "zero". It is also recommended that PFAS concentrations in drinking water be maintained as low as reasonably achievable (ALARA).

⁴Not applicable (N/A) because drinking water objective only applies to treated water.

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Appendix D — Metro Vancouver Detection of Waterborne *Cryptosporidium* and *Giardia* Annual Report January – December 2025

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Metro Vancouver

Detection of Waterborne *Cryptosporidium* and *Giardia*

Annual Report

January - December 2025

February 2026

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Environmental Microbiology
BCCDC Public Health Laboratory
Provincial Health Services Authority

Metro Vancouver Detection of Waterborne *Cryptosporidium* and *Giardia* Annual Report, January - December 2025

Purpose

To detect and quantify *Cryptosporidium* oocysts and *Giardia* cysts from Metro Vancouver reservoirs (Capilano, Coquitlam and Seymour), as well as from the Recycled Clarified Water (RCW) from Seymour-Capilano Filtration Plant (SCFP).

Introduction

On behalf of Metro Vancouver, the Environmental Microbiology Laboratory at BCCDC Public Health Laboratory (BCCDC PHL) examined the source water of Capilano, Coquitlam and Seymour reservoirs, as well as Recycled Clarified Water (RCW) at the Seymour-Capilano Filtration Plant (SCFP) for the presence of *Cryptosporidium* oocysts and *Giardia* cysts under the waterborne parasite surveillance program. All sample collection, testing, analysis, and reporting occurred monthly using a validated method.

Methods

All tests were performed at the Environmental Microbiology Laboratory at BCCDC PHL, conforming to the United States Environmental Protection Agency (USEPA) Method 1623.1: *Cryptosporidium* and *Giardia* in Water by Filtration/IMS/FA (4) for the detection of oocysts and cysts in water. As stated by Method 1623.1, the performance is based on the method applicable for the quantification of *Cryptosporidium* and *Giardia* in aqueous matrices. It requires the filtration of a large volume of water, elution off the filter, and immunomagnetic separation (IMS) to concentrate and purify the oocysts and cysts from sample material captured. After the IMS purification, immunofluorescence microscopy was performed to identify and enumerate oocysts and cysts. 4'-6-diamidino-2-phenylindole staining (DAPI) and differential interference contrast microscopy (DIC) are used to confirm internal structures of the cysts and oocysts.

Raw water samples were collected by Metro Vancouver at specific sampling sites at the reservoirs and filtration plants on the scheduled date, monthly. Water samples were filtered in the field using Pall Life Science Envirochek high volume (HV) filters. After collection/filtration, the Envirochek HV filters were transported to the Environmental Microbiology Laboratory at BCCDC PHL, where they were processed and analysed within 96 hours. Positive and negative controls were included for the entire process to assess the performance of the method. Matrix spike tests were also performed, annually, at scheduled collection periods, for a baseline assessment.

Results & Discussion

In 2025, 49 Envirochek HV sample filters were submitted and examined in total. The results are included in this report in the following tables and figures, separated as counts, morphology and matrix summaries. The raw data that corresponds to the summaries are shown in Appendix A.

Counts Summary

Table 1. Metro Vancouver *Giardia* and *Cryptosporidium* Filter Result Summary in 2025

	Capilano Reservoir		Coquitlam Reservoir		Seymour Reservoir		Seymour Capilano Filtration Plant – Recycled Clarified Water	
Number of Filter Tested	12		12		12		12	
Average volume (L) Filtered per Month	50.0		50.0		50.0		56.8	
Average Detection Limit (oo)cysts per 100 L	2.23		2.00		3.17		2.03	
	<i>Cryptosporidium</i>	<i>Giardia</i>	<i>Cryptosporidium</i>	<i>Giardia</i>	<i>Cryptosporidium</i>	<i>Giardia</i>	<i>Cryptosporidium</i>	<i>Giardia</i>
Number of Positive Filters	0	1	0	1	1	1	0	0
	0.0%	8.3%	0.0%	8.3%	8.3%	8.3%	0.0%	0.0%
Total (oo)cysts detected	0	2.8	0	2	4	2	0	0
Max Count of (oo)cysts per 100 L	0	2.8	0	2	4	2	0	0

Note: November 2025 filter for Seymour Reservoir was invalid due to excessive sediment in the sample. The filter was re-collected, and the results are included in this summary report.

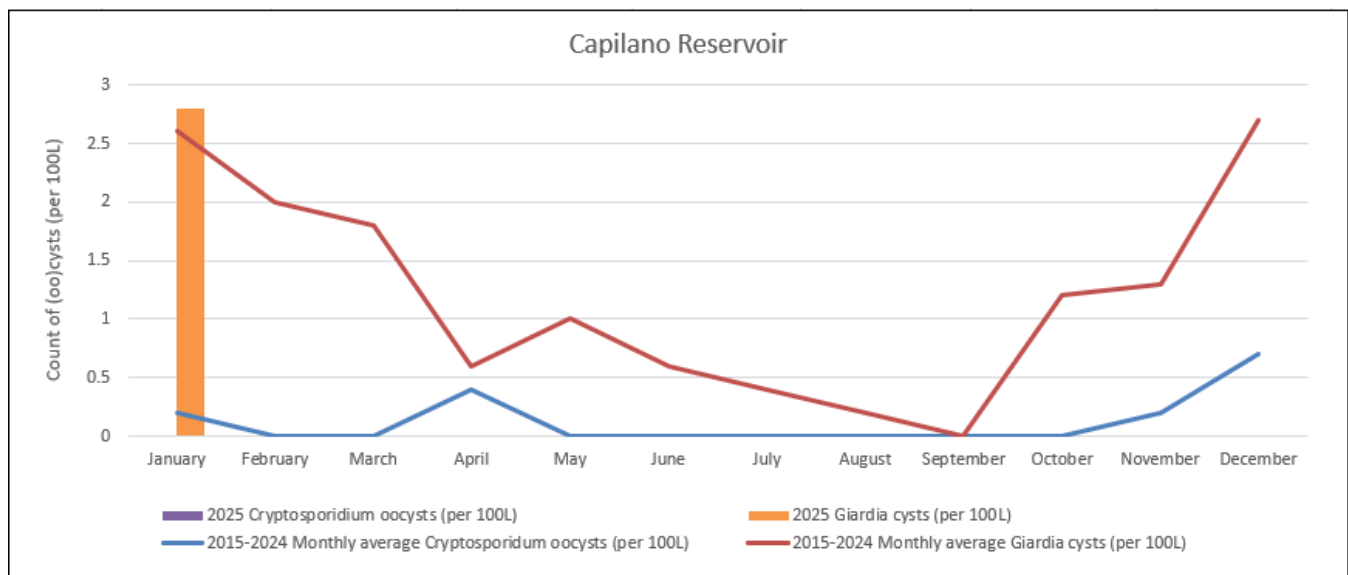


Figure 1. Capilano Reservoir *Cryptosporidium* Oocysts and *Giardia* Cysts Counts per 100 Litres of Raw Water in 2025

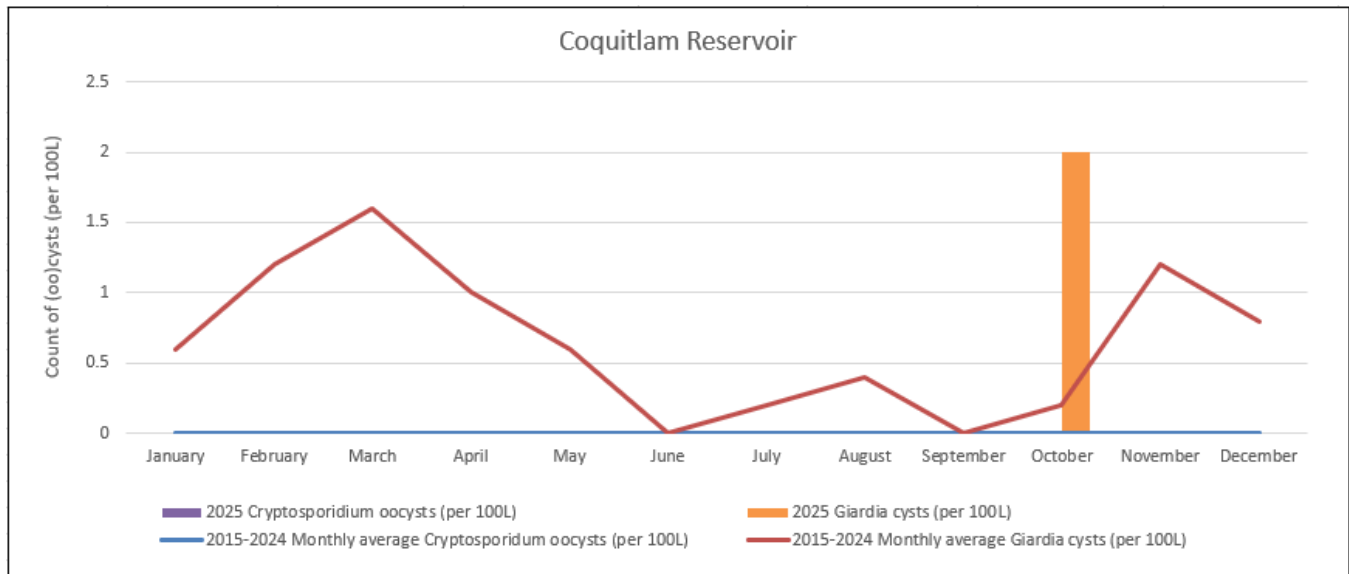


Figure 2. Coquitlam Reservoir *Cryptosporidium* Oocysts and *Giardia* Cysts Counts per 100 Litres of Raw Water in 2025

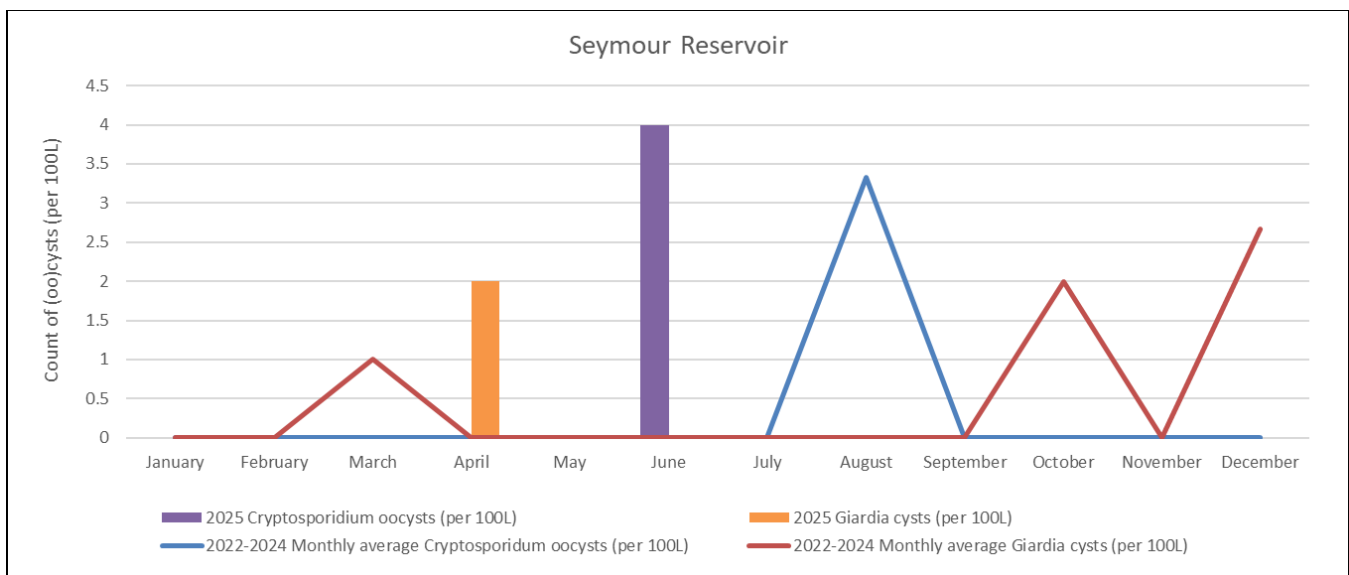


Figure 3. Seymour Reservoir *Cryptosporidium* Oocysts and *Giardia* Cysts Counts per 100 Litres of Raw Water in 2025. **Note:** Monthly average calculation begins July 2022.

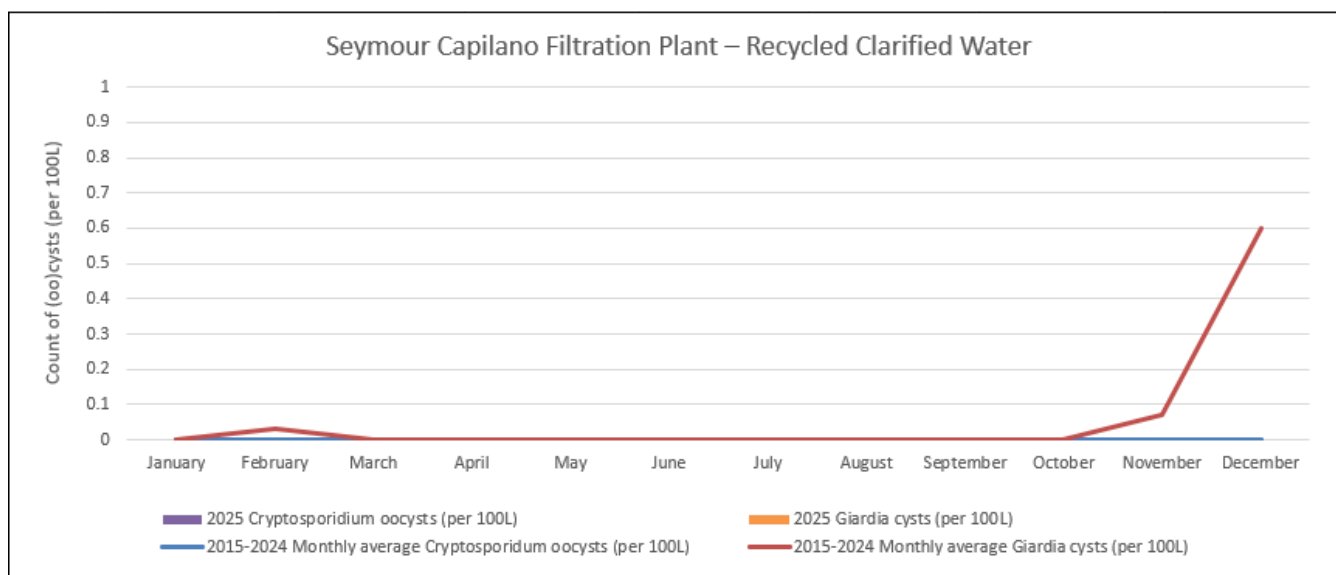


Figure 4. Seymour Capilano Filtration Plant - Recycled Clarified Water *Cryptosporidium* Oocysts and *Giardia* Cysts Counts per 100 Litres of Raw Water in 2025

Table 2. Average Historical Monthly Detection, 2015-2024.

	<i>Cryptosporidium</i> oocysts				<i>Giardia</i> cysts			
	Capilano Reservoir	Coquitlam Reservoir	Seymour Reservoir	Seymour Capilano Filtration Plant – Recycled Clarified Water	Capilano Reservoir	Coquitlam Reservoir	Seymour Reservoir	Seymour Capilano Filtration Plant – Recycled Clarified Water
January	0.2	0.0	0.0	0.0	2.6	0.6	0.0	0.0
February	0.0	0.0	0.0	0.0	2.0	1.2	0.0	0.0
March	0.0	0.0	0.0	0.0	1.8	1.6	1.0	0.0
April	0.4	0.0	0.0	0.0	0.6	1.0	0.0	0.0
May	0.0	0.0	0.0	0.0	1.0	0.6	0.0	0.0
June	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0
August	0.0	0.0	3.3	0.0	0.2	0.4	0.0	0.0
September	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
October	0.0	0.0	0.0	0.0	1.2	0.2	2.0	0.0
November	0.2	0.0	0.0	0.0	1.3	1.2	0.0	0.1
December	0.7	0.0	0.0	0.0	2.7	0.8	2.7	0.6

Note: Testing at Seymour Reservoir started in July 2022, therefore monthly average calculations for this site contains data only from July 2022 to 2024.

Morphological Results Summary

Table 3. 2025 Summary of morphological results for *Cryptosporidium* oocysts observed under fluorescence microscope

Site	Number of <i>Cryptosporidium</i> oocysts Observed	Morphology under Various Microscopy						Number of Nuclei per oocyst				
		DAPI -	DAPI +		DIC							
		Light blue internal staining, no distinct nuclei, green rim	Intense blue internal staining	Nuclei stained sky blue	Empty oocysts	Oocysts with amorphous structure	Oocysts with internal structure, sporozoites	0*	1	2	3	4
Capilano Reservoir	0	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Coquitlam Reservoir	0	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Seymour Reservoir	2	0 0.0%	0 0.0%	2 100.0%	0 0.0%	2 100.0%	0 0.0%	0 0.0%	0 0.0%	2 100.0%	0 0.0%	0 0.0%
Seymour Capilano Filtration Plant – Recycled Clarified Water	0	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%

Table 4. 2025 Summary of morphological results for *Giardia* cysts observed under fluorescence microscope

Site	Number of Giardia cysts Observed	Morphology under Various Microscopy								Number of Nuclei per cyst				
		DAPI -		DAPI +		DIC				0*	1	2	3	4
		Light blue internal staining, no distinct nuclei, green rim	Intense blue internal staining	Nuclei stained sky blue	Empty cysts	Cysts with amorphous structure	Cysts with internal structure							
							Nuclei	Median Body	Axoneme					
Capilano Reservoir	1	1 100.0%	0 0.0%	0 0.0%	1 100.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
Coquitlam Reservoir	1	1 100.0%	0 0.0%	0 0.0%	0 0.0%	1 100.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	
Seymour Reservoir	1	0 0.0%	0 0.0%	1 100.0%	0 0.0%	0 0.0%	1 100.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	1 100.0%	
Seymour Capilano Filtration Plant – Recycled	0	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	

Both DAPI and DIC microscopy are used for confirmation of the internal structures of *Cryptosporidium* oocysts and *Giardia* cysts. DAPI staining is also used as an indicator of cyst/oocyst integrity by staining nucleic DNA. The absence of nuclei is indicative of an aged, damaged or non-infective cell. Most oocysts and cysts observed across all sites had no visible nuclei indicating that they were aged and likely subjected to environmental degradation. However, these oocysts/cysts were likely previously in an infective state. DIC microscopy serves as an indicator of oocysts/cysts cytoplasm and cell wall integrity. While no median body (or axoneme) was observed for all *Giardia* cysts detected, the cytoplasm was observed in the majority, indicating that the cysts were not empty and could have been viable.

See Appendix A for detailed morphology for each (oo)cyst detection.

Matrix Summary

Due to the variations of water chemistry and organic matters between geographical areas and temporally, within each sampling site, a matrix spike is performed annually to provide recovery rate estimation from each site. 50L were provided from each site and the percentage recovery for *Cryptosporidium* oocysts and *Giardia* cysts and were noted in Table 5. Matrix recovery rates fluctuate from year-to-year, even within each site. This variation is not uncommon for the test and has been noted in USEPA's Method 1623.1.

Table 5: Matrix recovery results from 2007-2025.

Year	Capilano		Coquitlam		Seymour		Seymour Capilano Filtration Plant – Recycled Clarified Water	
	<i>Cryptosporidium</i> % Recovery	<i>Giardia</i> % Recovery	<i>Cryptosporidium</i> % Recovery	<i>Giardia</i> % Recovery	<i>Cryptosporidium</i> % Recovery	<i>Giardia</i> % Recovery	<i>Cryptosporidium</i> % Recovery	<i>Giardia</i> % Recovery
2007	27.6%	37.4%	28.0%	54.0%	not collected		not collected	
2008	25.0%	55.0%	28.0%	39.0%	not collected		not collected	
2009	10.0%	40.0%	16.0%	37.0%	not collected		not collected	
2010	28.0%	43.0%	26.0%	49.0%	not collected		17.0%	13.0%
2011	27.0%	44.0%	22.0%	47.0%	not collected		1.0%	0.0%
2012	38.4%	76.5%	35.0%	49.0%	not collected		7.0%	13.7%
2013	22.4%	59.4%	16.3%	64.4%	not collected		6.1%	14.9%
2014	not collected		55.0%	39.4%	not collected		18.0%	14.1%
2015	26.3%	40.4%	2.0%	60.6%	not collected		9.1%	26.5%
2016	35.4%	47.5%	22.2%	50.5%	not collected		9.1%	14.0%
2017	20.2%	38.4%	22.2%	21.2%	not collected		0.0%	2.0%
2018	43.4%	75.8%	17.1%	59.6%	not collected		1.0%	11.1%
2019	0.0%	43.0%	1.0%	55.0%	not collected		0.0%	4.1%
2020	5.1%	37.4%	8.1%	59.8%	not collected		0.0%	4.0%
2021 June	2.0%	53.0%	0.0%	35.0%	not collected		5.1%	38.0%
2021 November	11.1%	52.0%	15.2%	80.0%	not collected		0.0%	8.0%
2022 Summer	12.1%	17.0%	4.0%	13.0%	0.0%	19.0%	0.0%	11.0%
2022 Fall/Winter	0.0%	12.2%	5.1%	49.0%	not collected		1.0%	36.7%
2023 Fall/Winter	0.0%	32.0%	0.0%	41.4%	1%	59.6%	0.0%	6.1%
2024 Summer	1.0%	9.2%	2.0%	41.4%	3.0%	37.4%	0.0%	27.3%
2025 Fall	0.0%	0.0%	0.0%	6.0%	0.0%	17.0%	6.7%	57.0%

Summary

1. Positivity rates were on trend with previous years across all sites, Capilano Reservoir, Coquitlam Reservoir, Seymour Reservoir and SCFP-RCW.
 - a. *Cryptosporidium* oocysts were detected from Seymour Reservoir (1 filter, 8.3%).
 - b. *Giardia* cysts were detected from Capilano Reservoir (1 filter, 8.3%), Coquitlam Reservoir (1 filter, 8.3%), and Seymour Reservoir (1 filter, 8.3%).
2. In 2025, the highest concentration of
 - a. *Cryptosporidium* oocysts detected was 4 oocysts per 100 L from Seymour Reservoir in June.
 - b. *Giardia* cysts detected was 2.8 cysts per 100 L from Capilano reservoir.
3. *Cryptosporidium* oocysts and *Giardia* cysts detected showed evidence of environmental degradation, based on microscopic examination.
4. More data is required from Seymour Reservoir to establish reliable trends.
5. Matrix recovery in 2025 were low for both *Cryptosporidium* oocysts and *Giardia* cysts. Further matrix collection will be considered for continued investigation.

These *semi-quantitative* data (reported oocyst and cyst levels) should be interpreted in the context of, and with the understanding that the current standard laboratory method, USEPA Method 1623.1, used for detecting and analysing parasites in water matrices has its limitations, with variable recovery rates depending on the water matrix and environmental conditions.

Acknowledgements

The BCCDC Public Health Laboratory appreciates Metro Vancouver for their ongoing support of this program and other related projects. In particular, the assistance of Vila Goh, Eileen Butler, and Melody Sato of the Metro Vancouver, Water Quality Department are greatly appreciated.

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Appendix A

Table A1. Capilano Reservoir Summary 2025

Lab #	Site Sampled	Date Sampled	Volume filtered (L)	Detection Limit (per 100L)	# of wells read	Cryptosporidium oocysts (per 100L)	Giardia cysts (per 100L)
8502	Capilano Reservoir	January 19, 2025	50	<2.8	3	NPD	2.8
8509	Capilano Reservoir	February 9, 2025	50	<2.00	2	NPD	NPD
8515	Capilano Reservoir	March 16, 2025	50	<2.00	2	NPD	NPD
8521	Capilano Reservoir	April 13, 2025	50	<2.0	2	NPD	NPD
8532	Capilano Reservoir	May 25, 2025	50	<2	2	NPD	NPD
8538	Capilano Reservoir	June 15, 2025	50	<2	2	NPD	NPD
8544	Capilano Reservoir	July 13, 2025	50	<2.00	2	NPD	NPD
8551	Capilano Reservoir	August 17, 2025	50	<2.0	2	NPD	NPD
8557	Capilano Reservoir	September 21, 2025	50	<2.00	2	NPD	NPD
8565	Capilano Reservoir	October 19, 2025	50	<4.0	3	NPD	NPD
8573	Capilano Reservoir	November 16, 2025	50	<2.0	2	NPD	NPD
8582	Capilano Reservoir	December 14, 2025	50	<2.00	2	NPD	NPD

Note: NPD = no parasites detected

Table A2. Coquitlam Reservoir Summary 2025

Lab #	Site Sampled	Date Sampled	Volume filtered (L)	Detection Limit (per 100L)	# of wells read	Cryptosporidium oocysts (per 100L)	Giardia cysts (per 100L)
8503	Coquitlam Reservoir	January 19, 2025	50	<2.0	2	NPD	NPD
8510	Coquitlam Reservoir	February 9, 2025	50	<2.00	2	NPD	NPD
8516	Coquitlam Reservoir	March 16, 2025	50	<2.00	2	NPD	NPD
8522	Coquitlam Reservoir	April 13, 2025	50	<2.0	4	NPD	NPD
8533	Coquitlam Reservoir	May 25, 2025	50	<2	2	NPD	NPD
8539	Coquitlam Reservoir	June 15, 2025	50	<2	2	NPD	NPD
8545	Coquitlam Reservoir	July 13, 2025	50	<2.00	2	NPD	NPD
8552	Coquitlam Reservoir	August 17, 2025	50	<2.0	2	NPD	NPD
8558	Coquitlam Reservoir	September 21, 2025	50	<2.00	2	NPD	NPD
8566	Coquitlam Reservoir	October 19, 2025	50	<2.0	3	NPD	2.0
8574	Coquitlam Reservoir	November 16, 2025	50	<2.0	2	NPD	NPD
8583	Coquitlam Reservoir	December 14, 2025	50	<2.00	2	NPD	NPD

Note: NPD = no parasites detected

Table A3. Seymour Reservoir Summary 2025

Lab #	Site Sampled	Date Sampled	Volume filtered (L)	Detection Limit (per 100L)	# of wells read	Cryptosporidium oocysts (per 100L)	Giardia cysts (per 100L)
8504	Seymour Reservoir	January 19, 2025	50	<6.0	4	NPD	NPD
8511	Seymour Reservoir	February 9, 2025	50	<2.00	4	NPD	NPD
8517	Seymour Reservoir	March 16, 2025	50	<2.00	2	NPD	NPD
8523	Seymour Reservoir	April 13, 2025	50	<2.0	2	NPD	2.0
8534	Seymour Reservoir	May 25, 2025	50	<2	4	NPD	NPD
8540	Seymour Reservoir	June 15, 2025	50	<2	4	4.0	NPD
8546	Seymour Reservoir	July 13, 2025	50	<2.00	2	NPD	NPD
8553	Seymour Reservoir	August 17, 2025	50	<2.0	2	NPD	NPD
8559	Seymour Reservoir	September 21, 2025	50	<2.00	2	NPD	NPD
8567	Seymour Reservoir	October 19, 2025	50	<12.0	4	NPD	NPD
8575	Seymour Reservoir	November 16, 2025	50	N/A	4	INVALID	INVALID
8579	Seymour Reservoir	November 30, 2025	50	<2.0	2	NPD	NPD
8584	Seymour Reservoir	December 14, 2025	50	<2.00	2	NPD	NPD

Note: NPD = no parasites detected

Table A4. Seymour Capilano Filtration Plant – Recycled Clarified Water Summary 2025

Lab #	Site Sampled	Date Sampled	Volume filtered (L)	Detection Limit (per 100L)	# of wells read	Cryptosporidium oocysts (per 100L)	Giardia cysts (per 100L)
8505	SCFP - Recycled Clarified Water	January 21, 2025	72.5	<1.38	2	NPD	NPD
8512	SCFP - Recycled Clarified Water	February 11, 2025	49.3	<2.02	2	NPD	NPD
8518	SCFP - Recycled Clarified Water	March 18, 2025	78.9	<1.27	2	NPD	NPD
8524	SCFP - Recycled Clarified Water	April 15, 2025	55.2	<1.8	2	NPD	NPD
8535	SCFP - Recycled Clarified Water	May 27, 2025	84	<1.19	2	NPD	NPD
8541	SCFP - Recycled Clarified Water	June 17, 2025	87.2	<1.15	2	NPD	NPD
8547	SCFP - Recycled Clarified Water	July 15, 2025	55.6	<1.80	2	NPD	NPD
8554	SCFP - Recycled Clarified Water	August 19, 2025	55.3	<1.8	2	NPD	NPD
8562	SCFP - Recycled Clarified Water	September 23, 2025	35.2	<2.80	2	NPD	NPD
8568	SCFP - Recycled Clarified Water	October 21, 2025	38.4	<2.6	2	NPD	NPD
8576	SCFP - Recycled Clarified Water	November 18, 2025	47.2	<2.12	2	NPD	NPD
8585	SCFP - Recycled Clarified Water	December 16, 2025	22.7	<4.40	2	NPD	NPD

Note: NPD = no parasites detected

Table A5. Cryptosporidium oocysts detected in 2025

Lab #	Site name	Date sampled	Cryptosporidium								
			Cryptosporidium			DAPI -			DAPI +		
			Object located by FA	Shape (oval or round)	Size L x W (µm)	Light blue internal staining, no distinct nuclei, green rim	Intense blue internal staining	Number of nuclei stained sky blue	Empty oocysts	Oocysts with amorphous structure	Oocysts with internal structure, Number of sporozoites
8540	Seymour Reservoir	June 15, 2025	#1	round	5x5			2		P	
8540	Seymour Reservoir	June 15, 2025	#2	oval	4x3			2		P	

Note: P = present

Table A2. Giardia cysts detected in 2025

			Giardia											
Lab #	Site name	Date sampled	Giardia			DAPI -		DAPI +		DIC				
			Object located by FA	Shape (oval or round)	Size L x W (µm)	Light blue internal staining, no distinct nuclei, green rim	Intense blue internal staining	Number of nuclei stained sky blue	Empty cysts	Cysts with amorphous structure	Number of nuclei	Median Body	Axonem	
		-Y	-Y											
8502	Capilano Reservoir	January 19, 2025	#1	oval	12x10	P			P					
8523	Seymour Reservoir	April 13, 2025	1	Round	8x8			3			1			
8566	Coquitlam Reservoir	October 19, 2025	1	Oval	13x9	P				P				

Note: P = present

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