



**GREATER VANCOUVER WATER DISTRICT (GVWD)
BOARD OF DIRECTORS**

BOARD MEETING

Friday, April 28, 2023

9:00 am

28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia

Webstream available at <http://www.metrovancover.org>

[Membership and Votes](#)

A G E N D A¹

A. ADOPTION OF THE AGENDA

1. April 28, 2023 Meeting Agenda

That the GVWD Board adopt the agenda for its meeting scheduled for April 28, 2023 as circulated.

B. ADOPTION OF THE MINUTES

1. March 31, 2023 Meeting Minutes

pg. 4

That the GVWD Board adopt the minutes for its meeting held March 31, 2023 as circulated.

2. April 19, 2023 Special Joint Meeting Minutes

pg. 8

That the GVWD Board adopt the minutes for its special joint meeting held April 19, 2023 as circulated.

C. DELEGATIONS

D. INVITED PRESENTATIONS

E. CONSENT AGENDA

Note: Directors may adopt in one motion all recommendations appearing on the Consent Agenda or, prior to the vote, request an item be removed from the Consent Agenda for debate or discussion, voting in opposition to a recommendation, or declaring a conflict of interest with an item.

¹ Note: Recommendation is shown under each item, where applicable. All Directors vote unless otherwise noted.

1. WATER COMMITTEE REPORTS

1.1 GVWD 2022 Water Quality Annual Report

pg. 12

That the GVWD Board receive for information the report dated March 27, 2023, titled "GVWD 2022 Water Quality Annual Report".

2. FINANCE COMMITTEE REPORTS

2.1 Audited 2022 Financial Statements and Annual Financial Results

pg. 73

That the GVWD Board approve the Audited 2022 Financial Statements for the Greater Vancouver Water District.

F. ITEMS REMOVED FROM THE CONSENT AGENDA

G. REPORTS NOT INCLUDED IN CONSENT AGENDA

1. COMMISSIONER REPORTS

1.1 GVWD Water Development Cost Charge Bylaw 257, 2022 and GVWD Water Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw 256, 2022

pg. 209

That the GVWD Board:

- a) pass and finally adopt *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022*; and
- b) give third reading to the *Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022* as amended and presented in the report dated April 13, 2023; and
- c) pass and finally adopt *Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022* as amended and presented in the report dated April 13, 2023.

H. MOTIONS FOR WHICH NOTICE HAS BEEN GIVEN

I. OTHER BUSINESS

1. GVWD Board Committee Information Items and Delegation Summaries

pg. 231

J. BUSINESS ARISING FROM DELEGATIONS

K. RESOLUTION TO CLOSE MEETING

Note: The Board must state by resolution the basis under section 90 of the Community Charter on which the meeting is being closed. If a member wishes to add an item, the basis must be included below.

That the GVWD Board close its meeting scheduled for April 28, 2023 pursuant to section 226 (1) (a) of the *Local Government Act* and the *Community Charter* provisions as follows:

90 (1) A part of a council meeting may be closed to the public if the subject matter being considered relates to or is one or more of the following:

(g) litigation or potential litigation affecting the municipality.

L. RISE AND REPORT (Items Released from Closed Meeting)

M. ADJOURNMENT/CONCLUSION

That the GVWD Board adjourn/conclude its meeting of April 28, 2023.

**GREATER VANCOUVER WATER DISTRICT
BOARD OF DIRECTORS**

Minutes of the Regular Meeting of the Greater Vancouver Water District (GVWD) Board of Directors held at 10:16 am on Friday, March 31, 2023, in the 28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia.

MEMBERS PRESENT:

Delta, Chair, Director George V. Harvie
Anmore, Vice Chair, Director John McEwen
Burnaby, Director Pietro Calendino
Burnaby, Director Sav Dhaliwal
Burnaby, Director Mike Hurley
Coquitlam, Director Craig Hodge
Coquitlam, Director Teri Towner
Delta, Director Dylan Kruger*
Electoral Area A, Director Jen McCutcheon
Langley City, Director Paul Albrecht
Langley Township, Director Eric Woodward
Langley Township, Director Steve Ferguson
Maple Ridge, Director Dan Ruimy
New Westminster, Director Patrick Johnstone
North Vancouver City, Director Linda Buchanan
North Vancouver District, Director Lisa Muri
Pitt Meadows, Director Nicole MacDonald*
Port Coquitlam, Alternate Director Darrell
Penner for Brad West
Port Moody, Director Meghan Lahti

Richmond, Director Malcolm Brodie
Richmond, Director Bill McNulty
Richmond, Director Chak Au
Surrey, Director Linda Annis*
Surrey, Director Harry Bains*
Surrey, Director Gordon Hepner
Surrey, Director Pardeep Kooner
Surrey, Director Brenda Locke
Surrey, Director Rob Stutt
Tsawwassen, Chief Laura Cassidy*
Vancouver, Director Rebecca Bligh
Vancouver, Director Adriane Carr
Vancouver, Director Lisa Dominato
Vancouver, Director Sarah Kirby-Yung
Vancouver, Director Mike Klassen
Vancouver, Director Ken Sim
Vancouver, Director Lenny Zhou
West Vancouver, Director Mark Sager
Commissioner Jerry W. Dobrovolsky
(Non-voting member)

MEMBERS ABSENT:

Belcarra, Director Jamie Ross

STAFF PRESENT:

Dorothy Shermer, Corporate Officer
Morgan Mackenzie, Legislative Services Coordinator, Board and Information Services

A. ADOPTION OF THE AGENDA

1. March 31, 2023 Meeting Agenda

It was MOVED and SECONDED

That the GVWD Board adopt the agenda for its meeting scheduled for March 31, 2023 as circulated.

CARRIED

* denotes electronic meeting participation as authorized by Section 3.6.2 of the *Procedure Bylaw*

B. ADOPTION OF THE MINUTES

1. February 24, 2023 Meeting Minutes

It was MOVED and SECONDED

That the GVWD Board adopt the minutes for its meeting held February 24, 2023 as circulated.

CARRIED

C. DELEGATIONS

No items presented.

D. INVITED PRESENTATIONS

No items presented.

E. CONSENT AGENDA

At the request of the Directors, the following item was removed from the Consent Agenda, for consideration under Section F. Items removed from the consent agenda:

2.1 Climate Impacts on the Water Supply Areas

It was MOVED and SECONDED

That the GVRD Board adopt the recommendations presented in the following items as presented in the March 31, 2023 GVRD Board Consent Agenda:

1.1 2023 Water Sustainability Innovation Fund Applications

2.2 Award of Contract Resulting from RFP No. 22-139 Construction of the Coquitlam Main No. 4 South Section Robson Drive to Guildford Way

1.1 2023 Water Sustainability Innovation Fund Applications

Report dated February 9, 2023, from Linda Parkinson, Director, Policy, Planning and Analysis Water Services, seeking GVWD Board approval of five projects recommended for Sustainability Innovation Funding for the Board's consideration.

Recommendation:

That the GVWD Board approve the allocation from the Water Sustainability Innovation Fund of \$1,700,000 for the following projects, starting in 2023:

- a) Reducing Oxygen Use and Increasing Resiliency at the Coquitlam Water Treatment Plant for \$150,000 over two years;
- b) Studying the Preliminary Feasibility of Green Hydrogen Production from Hydropower at Cleveland Dam for \$250,000 over two years;
- c) Evaluation of Biofiltration at the Seymour Capilano Filtration Plant for \$300,000 over three years;
- d) Next Generation Snowpack Monitoring – Phase 3 for \$450,000 over three years;
- e) Building the Next Generation of Seasonal Water Supply & Demand Planning Tools for \$550,000 over two years.

Adopted on Consent

2.2 Award of Contract Resulting from RFP No. 22-139 Construction of the Coquitlam Main No. 4 South Section Robson Drive to Guildford Way

Report dated March 7, 2023, from George Kavouras, Acting Director, Procurement and Real Estate Services, and Bob Cheng, Director, Major Projects, Project Delivery, providing the GVWD Board with the results of RFP No. 22-139: Construction of the Coquitlam Main No. 4 South Section Robson Drive to Guildford Way and to recommend award of the contract in the amount of \$97,196,248 (exclusive of taxes) to Michels.

Recommendation:

That the GVWD Board:

- a) approve the award of a contract in the amount of \$97,196,248 (exclusive of taxes) to Michels Canada Company resulting from RFP No. 22-139: Construction of Coquitlam Main No. 4 South Section Robson Drive to Guildford Way, subject to final review by the Commissioner; and
- b) authorize the Commissioner and Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

Adopted on Consent

F. ITEMS REMOVED FROM THE CONSENT AGENDA

2.1 Climate Impacts on the Water Supply Areas

Report dated March 15, 2023, from the Water Committee, together with the report dated February 10, 2023 from Peter Marshall, Field Hydrologist, Environmental Management, Water Services, providing the GVWD Board with information on weather and climate conditions in the water supply areas, and to highlight how quickly the local climate is changing.

Members were provided a presentation on the climate impacts affecting the water supply areas, highlighting factors such as the air temperature, the amount of precipitation, the seasonal droughts, the wildfire impacts, the reducing size of the glaciers, and high impact weather events.

Presentation material titled “Water Supply Area Climate Report” is retained with the March 31, 2023 GVWD Board agenda.

It was MOVED and SECONDED

That the GVWD Board receive for information the report dated February 10, 2023, titled “Climate Impacts on the Water Supply Areas”.

CARRIED

G. REPORTS NOT INCLUDED IN CONSENT AGENDA

No items presented.

H. MOTIONS FOR WHICH NOTICE HAS BEEN GIVEN

No items presented.

I. OTHER BUSINESS

1. GVWD Board Committee Information Items and Delegation Summaries

J. BUSINESS ARISING FROM DELEGATIONS

No items presented.

K. RESOLUTION TO CLOSE MEETING

No items presented.

L. ADJOURNMENT/CONCLUSION

It was MOVED and SECONDED

That the GVWD Board conclude its meeting of March 31, 2023.

CARRIED

(Time: 10:30 am)

CERTIFIED CORRECT

Dorothy Shermer, Corporate Officer

George V. Harvie, Chair

59023451 FINAL

**SPECIAL JOINT MEETING
MVRD, MVHC, GVWD, and GVS&DD BOARDS**

Minutes of the Special Joint Meeting of the Metro Vancouver Regional District (MVRD), Metro Vancouver Housing Corporation (MVHC), the Greater Vancouver Water District (GVWD), and the Greater Vancouver Sewerage and Drainage District (GVS&DD) Board of Directors held at 9:00 am on Wednesday, April 19, 2023, in the 28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia.

MEMBERS PRESENT:

Delta, Chair, Director George V. Harvie
Anmore, Vice Chair, Director John McEwen
Belcarra, Director Jamie Ross
Bowen Island, Director Andrew Leonard
Burnaby, Director Pietro Calendino
Burnaby, Director Sav Dhaliwal
Burnaby, Director Mike Hurley
Coquitlam, Director Craig Hodge* (arrived 9:13 am)
Coquitlam, Director Teri Towner
Delta, Director Dylan Kruger
Electoral Area A, Director Jen McCutcheon
Langley City, Director Paul Albrecht
Langley Township, Director Eric Woodward
Lions Bay, Director Ken Berry* (arrived at 9:24 am)
Maple Ridge, Director Dan Ruimy
New Westminster, Director Patrick Johnstone
North Vancouver City, Director Linda Buchanan
North Vancouver District, Director Lisa Muri
Pitt Meadows, Director Nicole MacDonald (arrived at 9:05 am)
Port Coquitlam, Director Brad West

Port Moody, Director Meghan Lahti*
Richmond, Alternate Director Alexa Loo for Malcolm Brodie
Richmond, Director Bill McNulty
Richmond, Director Chak Au
Surrey, Director Linda Annis
Surrey, Director Harry Bains*
Surrey, Director Gordon Hepner
Surrey, Director Pardeep Kooner (arrived 9:05 am)
Surrey, Director Brenda Locke
Surrey, Director Rob Stutt
Vancouver, Director Rebecca Bligh
Vancouver, Director Adriane Carr
Vancouver, Director Lisa Dominato
Vancouver, Director Sarah Kirby-Yung*
Vancouver, Director Mike Klassen
Vancouver, Alternate Director Peter Meiszner for Ken Sim
Vancouver, Director Lenny Zhou
West Vancouver, Director Mark Sager* (departed at 9:22 am)
White Rock, Director Megan Knight

MEMBERS ABSENT:

Langley Township, Director Steve Ferguson
Tsawwassen, Director Laura Cassidy

STAFF PRESENT:

Jerry W. Dobrovolny, Chief Administrative Officer
Dorothy Shermer, Corporate Officer
Rapinder Khaira, Legislative Services Coordinator, Board and Information Services

* denotes electronic meeting participation as authorized by Section 3.6.2 of the *Procedure Bylaw*

A. ADOPTION OF THE AGENDA

1. April 19, 2023 Special Meeting Agenda

It was MOVED and SECONDED

That the MVRD, MVHC, GVS&DD, and GVWD Boards adopt the agenda for its special joint meeting scheduled for April 19, 2023 as circulated.

CARRIED

9:05 am Director Kooner and McDonald arrived at the meeting.

B. REPORTS FROM COMMITTEE OR COMMISSIONER/CHIEF ADMINISTRATIVE OFFICER

1. BOARD BUDGET WORKSHOP BACKGROUND MATERIALS

Jerry W. Dobrovolny, Commissioner/Chief Administrative Officer provided a verbal overview of the 2024 budget process and timeline, ongoing financial planning work, financial planning environment, Metro Vancouver cost apportionment and household impact, municipal portion of utilities, and 2024 budget approach.

9:13 am Director Hodge arrived at the meeting.

9:22 am Director Sager departed the meeting.

9:24 am Director Berry arrived at the meeting.

Presentation material titled “2024 Budget Process and Timeline” is retained with the April 19, 2023 MVRD Board agenda.

2. FINANCIAL PLAN TASK FORCE

2.1 Financial Plan Task Force Recommendations for the 2024-2028 Financial Plan

Report dated March 15, 2023, from Jerry W. Dobrovolny, Commissioner/Chief Administrative Officer, seeking MVRD/MVHC/GVS&DD/GVWD direction on potential targets on the household impact of the 2023-2028 Financial Plan.

Discussion ensued regarding the proposed household impact targets, development cost charge rate assumptions, and importance of economic testing and financial analysis to assess economic impact and viability with respect to development cost charge levies.

Main Motion

It was MOVED and SECONDED

That the MVRD/MVHC/GVS&DD/GVWD Board at the April 19 Board Budget Workshop:

- a) direct staff to proceed through the 2024 budget cycle with household impact targets as follows:
 - i. 2024 – 12%
 - ii. 2025 – 11%
 - iii. 2026 – 5%
 - iv. 2027 – 5%
- b) direct staff to prepare the 2024 – 2028 Financial Plan with the following Development Cost Charge (DCC) rate assumptions:
 - i. Liquid Waste Development Cost Charges moving to a 1% assist factor with interest as part of the 2024-2028 Financial Plan
 - ii. Water Development Cost Charges moving to a 1% assist factor with interest as part of the 2024-2028 Financial Plan; and
 - iii. Implementation of a Development Cost Charge for Regional Parks and move to a 1% assist factor within the 2024-2028 Financial Plan.

Amendment to Main Motion:

It was MOVED and SECONDED

That the MVRD/MVHC/GVS&DD/GVWD Board amend the main motion by adding “,subject to financial analysis and economic testing:” in subsection b) after “rate assumptions”.

Discussion ensued regarding the clarity of the wording of the amendment.

Amendment to Amendment:

It was MOVED and SECONDED

That the MVRD/MVHC/GVS&DD/GVWD Board amend the amendment by replacing “subject to” with “including”.

CARRIED

Question on the Amendment to the Main Motion

The question was then called on the Amendment to the Main Motion and the amendment motion was

DEFEATED

Question on the Main Motion

The question was then called on the Main Motion and the motion was

CARRIED

Director Buchanan proposed a motion arising for the Board's consideration.

It was MOVED and SECONDED

That staff be directed to provide the Finance Committee and the Metro Vancouver Regional District Board with the Best Practice Review regarding Long-Term Financial Planning.

CARRIED

C. ADJOURNMENT OR CONCLUSION

It was MOVED and SECONDED

That the MVRD, MVHC, GVS&DD, and GVWD Boards conclude its special joint meeting of April 19, 2023.

CARRIED

(Time: 10:48 am)

CERTIFIED CORRECT

Dorothy Shermer, Corporate Officer

George V. Harvie, Chair

59317471 FINAL

To: Water Committee

From: Rick Zolkiewski, Program Manager - Quality Control, Interagency Projects and
Quality Control, Water Services

Date: March 27, 2023

Meeting Date: April 12, 2023

Subject: **GVWD 2022 Water Quality Annual Report**

RECOMMENDATION

That the GVWD Board receive for information the report dated March 27, 2023, titled “GVWD 2022 Water Quality Annual Report”.

EXECUTIVE SUMMARY

The Greater Vancouver Water District (GVWD) 2022 Water Quality Annual Report is required under the provincial *Drinking Water Protection Regulation* (DWPR), and Metro Vancouver’s *Drinking Water Management Plan* (DWMP). The annual report summarizes the analysis of over 160,000 tests conducted on samples collected from the GVWD source reservoirs, in-system reservoirs, and transmission system, as well as microbiological water quality of member jurisdictions’ systems supplied by the GVWD.

The annual report outlines how Metro Vancouver’s water quality monitoring program continues to fulfill its role in confirming that the multiple protection barriers for drinking water, including watershed protection, water treatment, and the ongoing operation of the water system, continue to ensure excellent water quality for the region.

In 2022, the water quality of the treated drinking water was excellent. All water quality parameters analyzed met or exceeded provincial water quality regulations and the federal *Guidelines for Canadian Drinking Water Quality* (GCDWQ).

PURPOSE

To provide the Board with a summary of the GVWD 2022 Water Quality Annual Report.

BACKGROUND

Each year Metro Vancouver is required, under the provincial DWPR, to produce an annual report on drinking water quality. The annual report is also a requirement of Metro Vancouver’s DWMP. The annual report provides the key results and findings associated with Metro Vancouver’s program of continuous monitoring and assessment of drinking water quality in the region. Over 160,000 tests are conducted annually to provide an assessment of drinking water quality relative to the existing drinking water standards and guidelines and highlights any unusual occurrences. Monitoring results for member jurisdictions are also discussed in the annual report, where relevant.

In accordance with Section 11 of the DWPR, the annual report will be sent to the Chief Medical Health Officers of the Vancouver Coastal and Fraser Health Authorities.

Additionally, the annual report will be made accessible to the public through public libraries in the region, including Metro Vancouver's Library and Information Centre, and will be posted on Metro Vancouver's website.

This report is being brought forward at this time to enable Metro Vancouver and its member jurisdictions to meet the reporting timeline stipulated in the DWPR.

WATER QUALITY/TREATMENT HIGHLIGHTS

A summary of the main items relevant to water quality during 2022 are as follows:

1. Source Water Quality

- In 2022, the turbidity levels of the delivered water met the requirements of the GCDWQ.
- The Capilano supply was in service for the entire year. Heavy rainfall events in January resulted in Capilano source water turbidity peaking just over 6.5 Nephelometric Turbidity Unit (NTU). Even with the higher turbidity, the delivered filtered Capilano water was less than 0.15 NTU as measured by online instruments for the entire year.
- The Seymour supply was in service for the entire year. Heavy rainfall events in late December resulted in Seymour source water turbidity peaking at 5.4 NTU. The delivered filtered Seymour water was less than 0.15 NTU as measured by online instruments for the entire year.
- The Coquitlam supply was in service for the entire year. The unfiltered Coquitlam source water was greater than 1.0 NTU for 10 days in 2022 and did not exceed 5.0 NTU throughout the year in accordance with GVWD's Permit to Operate.
- The microbiological quality of the three source waters was excellent in 2022. 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 avoiding filtration outlined in the turbidity section of the GCDWQ.
- Results of the analyses of the source water 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.

2. Water Treatment

- The Seymour Capilano Filtration Plant (SCFP) performance, as measured by the quality of the delivered water, was excellent in 2022. The daily average turbidity of water leaving the Clearwells to enter the GVWD transmission system was an average of 0.15 NTU in 2022.
- Turbidity levels for Individual Filter Effluent (IFE) met the turbidity requirements of the GCDWQ.
- Filtration consistently removed iron, colour and organics from the Capilano and Seymour source water.
- Levels of total aluminum in filtered water were consistently below the GCDWQ operational guideline value of 0.1 mg/L for direct filtration plants using aluminum-based coagulants. The maximum value for 2022 was 0.06 mg/L.
- There were no outages of ultraviolet treatment at the SCFP and the Coquitlam Water Treatment Plant (CWTP).
- The SCFP and CWTP operated the full year using sodium hypochlorite for chlorination.

- The secondary disinfection stations boosted chlorine when required.

3. Transmission and Distribution System Water Quality

- Bacteriological water quality was excellent in the GVWD transmission mains and in-system storage reservoirs. The number of E. coli detected in both GVWD and member jurisdiction drinking water samples is typically very low. More than 28,700 samples were collected and analyzed for GVWD and member jurisdiction systems in 2022, of which one member jurisdiction sample was positive for E. coli. Three repeat samples were taken and no additional E. coli were found.
- The running average levels of the Trihalomethane (THM) group of chlorine disinfection by-products detected in the delivered water in the GVWD and member jurisdiction systems were below the Maximum Acceptable Concentration (MAC) in the GCDWQ of 100 µg/L (0.1 mg/L). The running average levels for the Haloacetic Acid (HAA) group of chlorine disinfection by-products were below the GCDWQ Maximum Acceptable Concentration (MAC) of 80 µg/L (0.08 mg/L).

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Water quality analyses included in the annual report are incorporated within the annual operating budget of the Interagency Projects and Quality Control Division's Drinking Water Quality Control Program.

CONCLUSION

As outlined by the GVWD 2022 Water Quality Annual Report, Metro Vancouver's water quality monitoring program continues to fulfill its role in confirming that the multiple protection barriers for drinking water, including watershed protection, water treatment, and the ongoing operation of the water system, are effective at ensuring excellent drinking water quality for the region. This monitoring is essential in assessing performance of treatment technologies to ensure compliance with current standards and identify potential treatment upgrade requirements for the future.

The drinking water provided by the GVWD to its member jurisdictions met or exceeded all applicable water quality regulations, operating permits, and guidelines in 2022.

Attachment

"Greater Vancouver Water District 2022 Water Quality Annual Report, Volume 1", dated March 2023 (57690220)



Greater Vancouver Water District

2022 Water Quality Annual Report

Volume 1 of 2

March 2023

57690220

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ACRONYMS

ACU	Apparent Colour Unit
ALARA	As Low As Reasonably Achievable
AO	Aesthetic Objective (characteristics such as taste, 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
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
HAA	Haloacetic Acid
HPC	Heterotrophic Plate Count
IFE	Individual Filter Effluent
MAC	Maximum Acceptable Concentration
mg/L	Milligram per litre (0.001 g/L)
µg/L	Microgram per litre (0.000001 g/L)
mL	Milliliter
MF	Membrane Filtration
mJ/cm ²	Millijoule per centimeter squared
MPN	Most Probable Number
N/A	Not Applicable
NTU	Nephelometric Turbidity Unit
PAH	Polycyclic Aromatic Hydrocarbons
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
pH	Measure of acidity or basicity of water; pH 7 is neutral
SCFP	Seymour Capilano Filtration Plant
THAA	Total Haloacetic Acids
THM	Trihalomethane
TSI	Trophic State Index
TTHM	Total Trihalomethanes
UV ₂₅₄	Ultraviolet Absorbance at 254 nm
VOC	Volatile Organic Compounds
WQMRP	<i>Water Quality Monitoring and Reporting Plan for Metro Vancouver (GVWD) and Local Government Members</i>

EXECUTIVE SUMMARY

Source Water Quality

- In 2022, the turbidity levels of the delivered water met the requirements of the *Guidelines for Canadian Drinking Water Quality* (GCDWQ).
- The Capilano supply was in service for the entire year. Heavy rainfall events in January resulted in Capilano source water turbidity peaking just over 6.5 Nephelometric Turbidity Unit (NTU). Even with the higher turbidity, the delivered filtered Capilano water was less than 0.15 NTU as measured by online instruments for the entire year.
- The Seymour supply was in service for the entire year. Heavy rainfall events in late December resulted in Seymour source water turbidity peaking at 5.4 NTU. The delivered filtered Seymour water was less than 0.15 NTU as measured by online instruments for the entire year.
- The Coquitlam supply was in service for the entire year. The unfiltered Coquitlam source water was greater than 1.0 NTU for 10 days in 2022 and did not exceed 5.0 NTU throughout the year in accordance with Greater Vancouver Water District's (GVWD) Permit to Operate.
- The microbiological quality of the three source waters was excellent in 2022. 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 avoiding filtration outlined in the turbidity section of the GCDWQ.
- Analytical results of the source water for herbicides, pesticides, volatile organic compounds and radionuclides were all found to be below the recommended limits as listed in the GCDWQ.

Water Treatment

- The Seymour Capilano Filtration Plant (SCFP) performance, as measured by the quality of the delivered water, was excellent in 2022. The daily average turbidity of water leaving the Clearwells to enter the GVWD transmission system was an average of 0.15 NTU in 2022.
- Turbidity levels for Individual Filter Effluent (IFE) met the turbidity requirements of the GCDWQ.
- Filtration consistently removed iron, colour and organics from the Capilano and Seymour source waters.
- Levels of total aluminum in filtered water were consistently below the GCDWQ operational guideline value of 0.1 mg/L for direct filtration plants using aluminum-based coagulants. The maximum value for 2022 was 0.055mg/L.
- There were no outages of ultraviolet treatment at the SCFP and the Coquitlam Water Treatment Plant (CWTP).
- The SCFP and CWTP operated the full year using sodium hypochlorite for chlorination.
- The secondary disinfection stations boosted chlorine when required.

Transmission/Distribution System Water Quality

- Bacteriological water quality was excellent in the GVWD transmission mains and in-system storage reservoirs. The number of *E. coli* detected in both GVWD and member jurisdiction drinking water samples is typically very low. More than 28,700 samples were collected and analyzed for GVWD and member jurisdiction systems in 2022, of which one sample was positive for *E. coli*.
- The running average levels of the Trihalomethane (THM) group of chlorine disinfection by-products detected in the delivered water in the GVWD and member jurisdiction systems were below the Maximum Acceptable Concentration (MAC) in the GCDWQ of 100 µg/L (0.1 mg/L). The running average levels for the Haloacetic Acid (HAA) group of chlorine disinfection by-products were below the GCDWQ Maximum Acceptable Concentration (MAC) of 80 µg/L (0.08 mg/L).

1.0 SOURCE WATER QUALITY

The first barrier in place to protect the quality of the drinking water supply is the protection of the Water Supply Area to ensure the best quality source water. Source water monitoring provides ongoing confirmation that the barrier is effective, identifies seasonal changes and provides the monitoring information necessary to adjust the level of water treatment that is in place. 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 details regarding the water sampling frequency.

1.1. Bacteriological Quality of the Source Water

The bacteriological quality of the source water is an important indicator of the degree of contamination, and the treatment required to ensure a safe 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 levels of *E. coli* for all three sources were below the 10% limit in the provincial DWTO.

	Percent of samples (daily) in a six month period ending on the last day of the month named where <i>E. coli</i> greater than 20/100 mL		
Month	Capilano	Seymour	Coquitlam
Jan	3.8%	7.7%	3.8%
Feb	3.9%	7.8%	3.9%
Mar	0.0%	3.3%	0.6%
Apr	0.0%	0.0%	0.0%
May	0.0%	0.0%	0.0%
Jun	0.0%	0.0%	0.0%
Jul	0.0%	0.0%	0.0%
Aug	0.0%	0.0%	0.0%
Sep	0.0%	0.0%	0.0%
Oct	2.2%	1.6%	1.1%
Nov	3.3%	4.4%	1.1%
Dec	3.3%	4.5%	1.1%

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

Figure 1 shows the results of the analysis of the source water from 2019 to 2022 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.

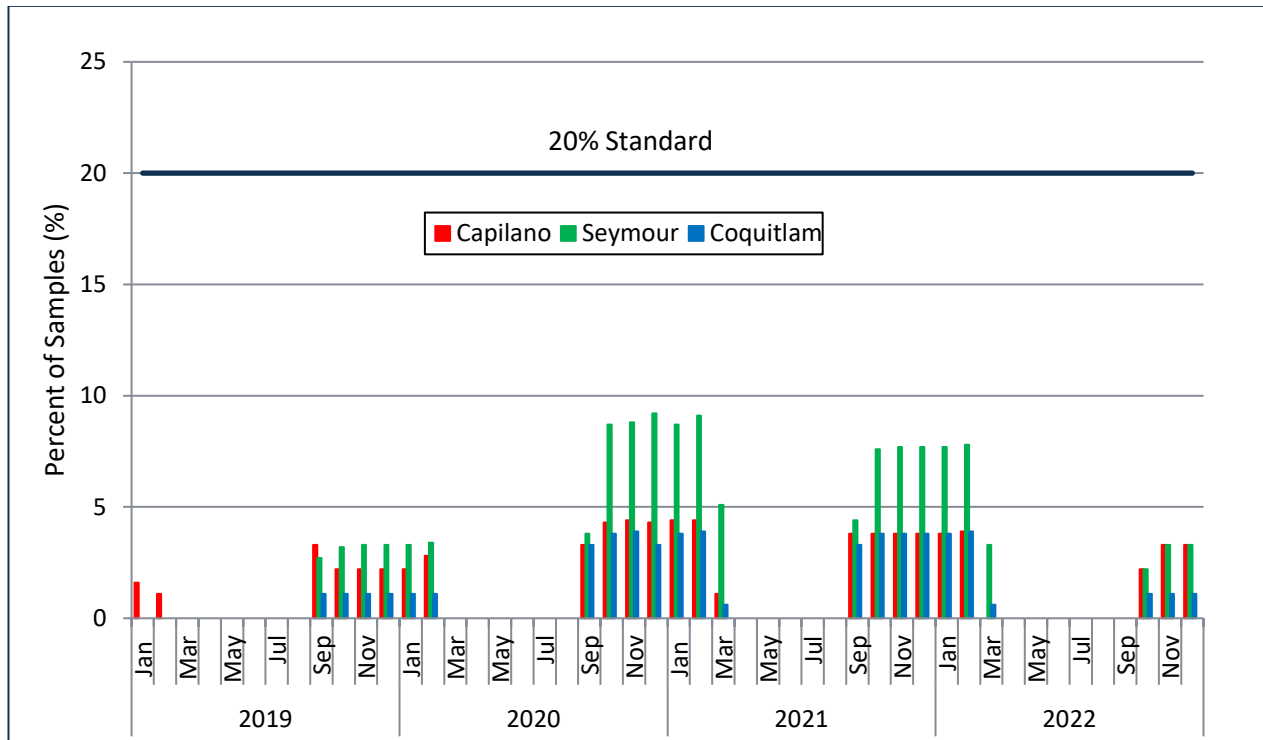


Figure 1: Percent of Samples Exceeding 20 *E. coli*/100 mL at all Three Sources (2019 to 2022)

Note: Metro Vancouver has protected Water Supply Areas and therefore the source of *E. coli* is most likely originating from endemic animals in the Water Supply Areas. Samples in summer have minimal *E. coli* and no detectable amounts for some sources.

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

Unfiltered 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 raw 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 in the GVWD water supplies. The program has involved collecting samples from the Capilano and Coquitlam supplies upstream of disinfection; beginning in July 2022 Metro Vancouver increased monitoring to include Seymour source prior to treatment. This is in addition to the existing monitoring of recycled water at the SCFP.

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.

Complete results of the 2022 testing program are contained in the “Metro Vancouver Detection of Waterborne *Cryptosporidium* and *Giardia* January - December, 2022 Annual Report”, which was prepared by the BCCDC PHL Environmental Microbiology Laboratory, and can be found in Appendix D. Two of twelve (17%) samples collected at Capilano and one of the twelve (8%) collected at Coquitlam were positive for *Giardia* (Table 2).

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Capilano	50	18	18	50	58	33	33	33	25	17
Seymour	-	-	-	-	-	-	-	-	-	0
Coquitlam	23	8	0	17	67	8	25	25	25	8

Table 2: Percent of Samples Positive for *Giardia*

Zero of twelve (0%) samples collected at Capilano were positive for *Cryptosporidium*, and zero of twelve (0%) were positive at Coquitlam (Table 3). Collection of *Giardia* and *Cryptosporidium* samples from the Seymour source as initiated in August 2022. The percentages for Seymour shown on Tables 2 and 3 are for only 5 months compared to the Capilano and Coquitlam sources, which are based on 12 months.

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Capilano	9	9	9	25	17	8	0	0	0	0
Seymour	-	-	-	-	-	-	-	-	-	0
Coquitlam	9	0	0	0	0	0	0	0	0	0

Table 3: Percent of Samples Positive of *Cryptosporidium*

Year to year fluctuations are demonstrated for *Giardia* and *Cryptosporidium* and there has always been considerable variation in the results.

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 re-suspension of sediment from the edges of the lakes during periods of low water levels. The DWTO allows a utility to be exempt from filtration if the turbidity does not exceed specific water quality parameters requirements and provided that a number of other provisions, including source water protection, and two forms of water treatment requirements are in place. Historically the turbidity levels on both the Capilano and Seymour sources would not meet these criteria, and filtration was implemented for both supplies.

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 so these source water criteria do not apply to the delivered water. Coquitlam, which is unfiltered, was in service for all of 2022 in accordance with the DWTO.

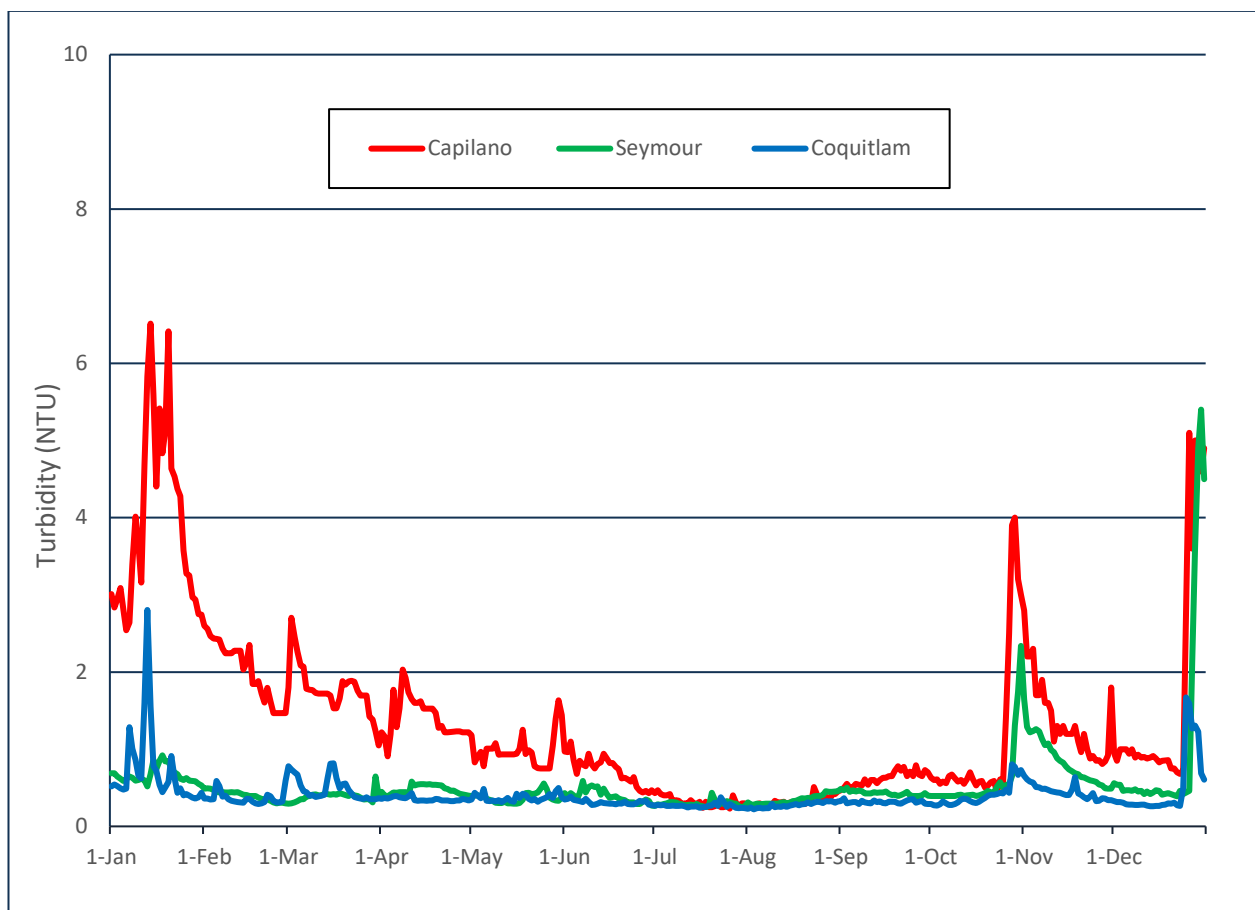


Figure 2: Average Daily Turbidity of Source Water (From In-line Readings)

1.4. Chemistry

1.4.1. Chemical and Physical Characteristics 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 2022 were similar to those for previous years. The analysis was carried out by accredited laboratories using methods based on the current version of *Standard Methods For the Examination of Water and Wastewater*.

1.4.2. Analysis of Water for Organic Components and Radionuclides

Analyses of the source water for a variety of organic and other compounds, including all of the compounds with a specified MAC in the *Guidelines for Canadian Drinking Water Quality* (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 limits.

1.4.3. PFOS and PFOA

Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) testing is conducted on source waters and the results are detailed in Table 4. Common sources of these synthetic chemicals are from consumer products and fire-fighting foam, for their water and oil repellent properties. Neither parameter was detected above the applicable health based limits at the time of the publication of this report.

Parameter	Capilano (ng/L)	Seymour (ng/L)	Coquitlam (ng/L)	MAC (ng/L)
	Jul 26	Jul 26	Jul 26	
PFOS	<0.2	<0.2	<0.2	600
PFOA	<0.2	<0.2	<0.2	200

Table 4: Monitoring of Source Waters for PFOS and PFOA

1.4.4. Limnology

The Reservoir Water Quality Monitoring Program, started in 2014, collects limnology data (physical, chemical and biological parameters) for the Capilano, Seymour and Coquitlam supply reservoirs. Reservoir monitoring information is important in proactively managing 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 quality are scientifically tracked over time.

Water sampling of the source reservoirs and inflow rivers is conducted between April and November. Biological productivity that can influence water quality is the highest during this time of year, making it an important time for sampling and measurements. Monthly sampling of the source water is conducted and sample analysis undertaken by accredited labs. More frequent water quality measurements are compiled by arrays of scientific instruments in each reservoir.

Metro Vancouver analysis of 2022 data resulted, as in previous years, in confirmation that the three reservoirs are ultra-oligotrophic (see Table 5), which means they have low levels of available nutrients and low levels of biological production. A single value called the Trophic State Index (TSI) is used to infer time course change in water quality based on the amount of algal biomass in the water column of each reservoir. TSI values have remained consistently low since measurements began (see Figure 3), which shows low biological production. The ultra-oligotrophic classification and low TSI values are highly desirable for source drinking water supply and shows that the GVWD Water Supply Areas and reservoirs continue to supply high quality source water.

There is worldwide interest in bluegreen 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 is called *Merismopedia* spp., which is thought to produce these microcystins. Despite the presence of cyanobacteria, the concentration of microcystins in GVWD reservoirs remains below the level stipulated in the GCDWQ, 1.5 µg/L. This desirable condition is due to the ultra-oligotrophic status of the reservoirs. Metro Vancouver continues to monitor cyanobacteria, including *Merismopedia* spp. as well as processes in the 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 reservoir management strategies.

Chemical Measurement	Average Value					Status of Reservoirs
	Ultra-oligotrophic status ¹	Ultra-oligotrophic status	Capilano Reservoir 2014-2022 (2022 only)	Seymour Reservoir 2014-2022 (2022 only)	Coquitlam Reservoir 2014-2022 (2022 only)	
Total Phosphorus (µg/L)	5.0	8.0	3.1 (3.1)	3.2 (3.5)	3.2 (4.0)	Ultra-oligotrophic (very high water quality)
Total Nitrogen (µg/L)	250	661	122 (105)	120 (109)	128 (121)	Ultra-oligotrophic (very high water quality)
Phytoplankton Biomass (µg/L of chlorophyll-a)	0.5	1.7	0.43 (0.68)	0.55 (0.68)	0.59 (0.85)	Ultra-oligotrophic (very high water quality)

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

¹Wetzel, R.G. 2001 River Ecosystems. 3rd edition. Academic Press. New York.

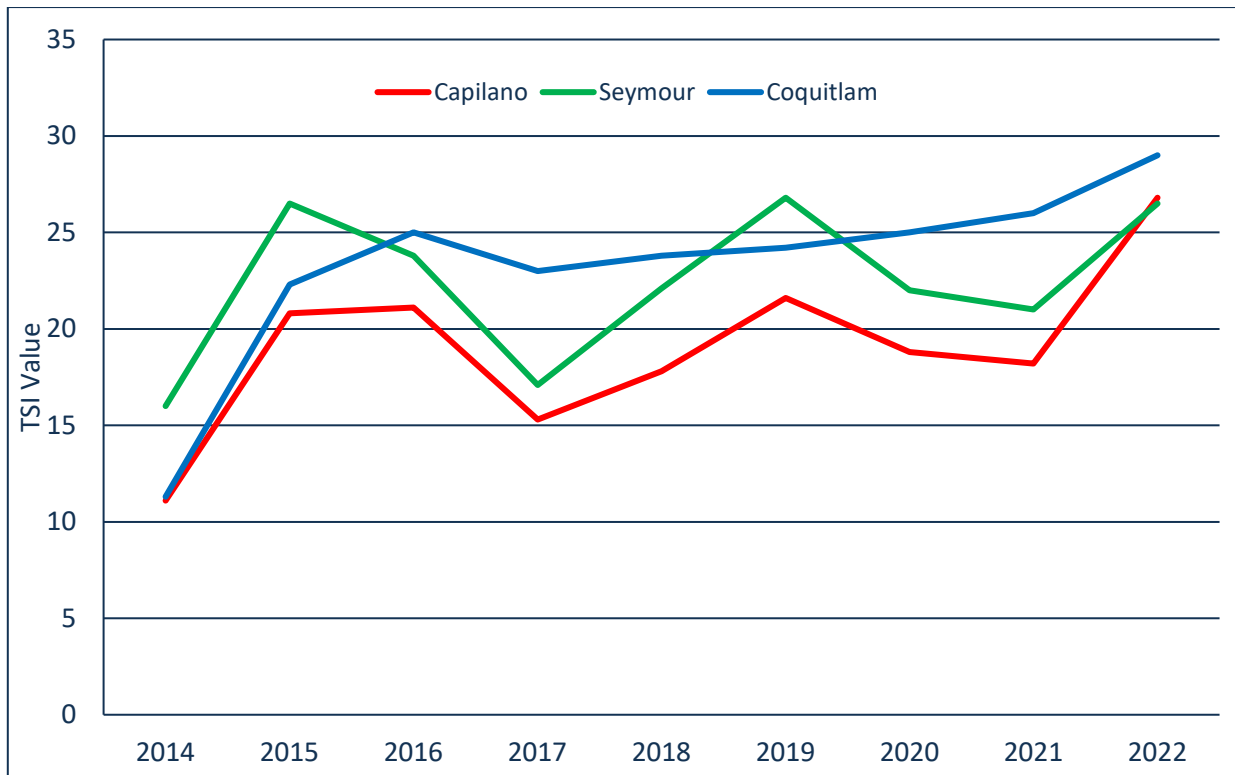


Figure 3: Trophic State Index of Source Waters

2.0 QUALITY CONTROL ASSESSMENT OF WATER TREATMENT

Primary treatment of the source water is the second barrier, following source water protection, used to assure the quality of the water supply.

Metro Vancouver filters water from the Capilano and Seymour source reservoirs at the Seymour Capilano Filtration Plant (SCFP), which is located in GVWD's Lower Seymour Conservation Reserve. Twin tunnels connect the two supply sources. Each tunnel is 3.8 metres in diameter, 7.1 kilometres long, and 160 to 640 meters below ground level, running beneath Grouse Mountain and Mount Fromme. The water from the Raw Water Tunnel is filtered and treated alongside the Seymour source water at the Seymour Capilano Filtration Plant (SCFP). Both treated sources enter the Clearwell at the SCFP for further treatment before the blended water is distributed to the region. Blended treated water returns to Capilano service area through the Treated Water Tunnel and provides high quality drinking water to the Capilano area, while the remainder is distributed through the Seymour system. This system typically supplies about two thirds of the region's drinking water.

The Coquitlam Water Treatment Plant 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. 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 the microbial risks using a combination of direct filtration, Ultraviolet (UV) light and chlorine at SCFP, and using ozone, UV light and chlorine at 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 hydrated lime before the water enters the Clearwells. The West and East Clearwells are large water storage reservoirs that store and allow controlled passage of water with mixing (or blending) of the injected chlorine and hydrated lime. The Clearwells provide sufficient retention (or contact time) with chlorine to provide any further disinfection required after filtration and ultraviolet light treatment. Carbon dioxide (CO₂) in solution is added to trim pH once the desired alkalinity is reached using hydrated lime. After the Clearwells, the finished water enters the transmission system at the Seymour Treated Water Valve Chamber. The quality of the water produced has been excellent leaving the SCFP.

2.1.1. Filtration

Filtration treatment of the Capilano and Seymour water sources help improve the characteristics of the delivered water. This includes a visible decrease in colour and increase in clarity. There is a total loss of brown hue that can sometimes characterize Capilano and Seymour source waters. This improvement in colour is a result of removal of the naturally occurring parameters that cause the brown hue by the filtration process.

Suspended particles in water that cause light to scatter (turbidity) are also removed. The end product is water that is very clear. Due to the purity of the water, it may have a slight bluish tinge.

Figure 4 compares the apparent colour of SFCP filtered water and Capilano and Seymour source waters for 2022. During the fall rainfall events, the apparent colour of the Seymour source water feeding the SFCP had a reading of 44 Apparent Colour Unit (ACU). After the removal of the organic material through filtration, the colour of the filtered water delivered to the public was never greater than 6 ACU.

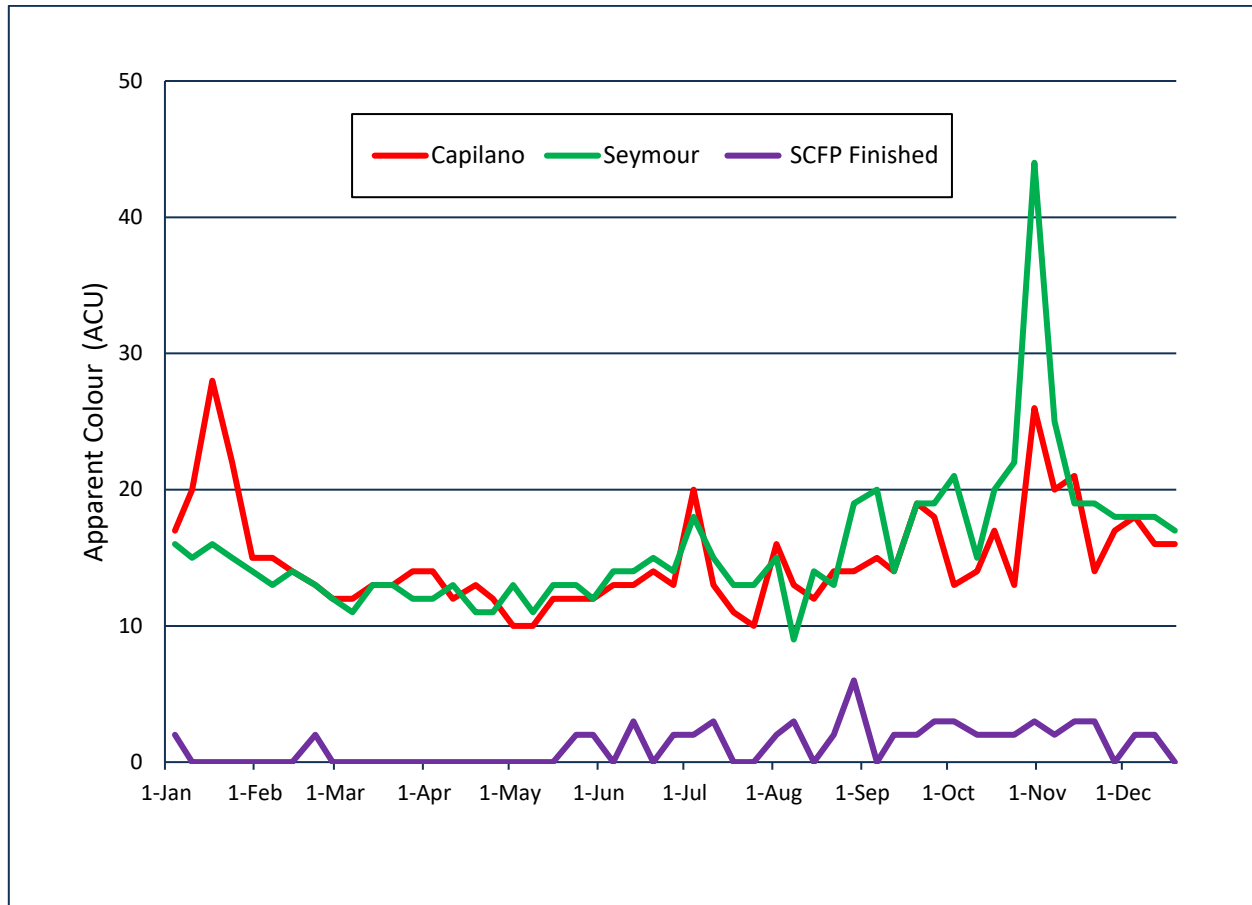


Figure 4: Apparent Colour Levels Before and After Filtration

Figure 5 compares turbidity of the two source waters that feed the SCFP to the turbidity level of the finished water. The Seymour source experienced an average daily turbidity greater than 1.0 NTU for 23 days. The Capilano source exceeded 1.0 NTU on 159 days. Since both sources are filtered at the SCFP, the maximum average daily turbidity of the delivered water was 0.28 NTU, and the average was 0.15 NTU.

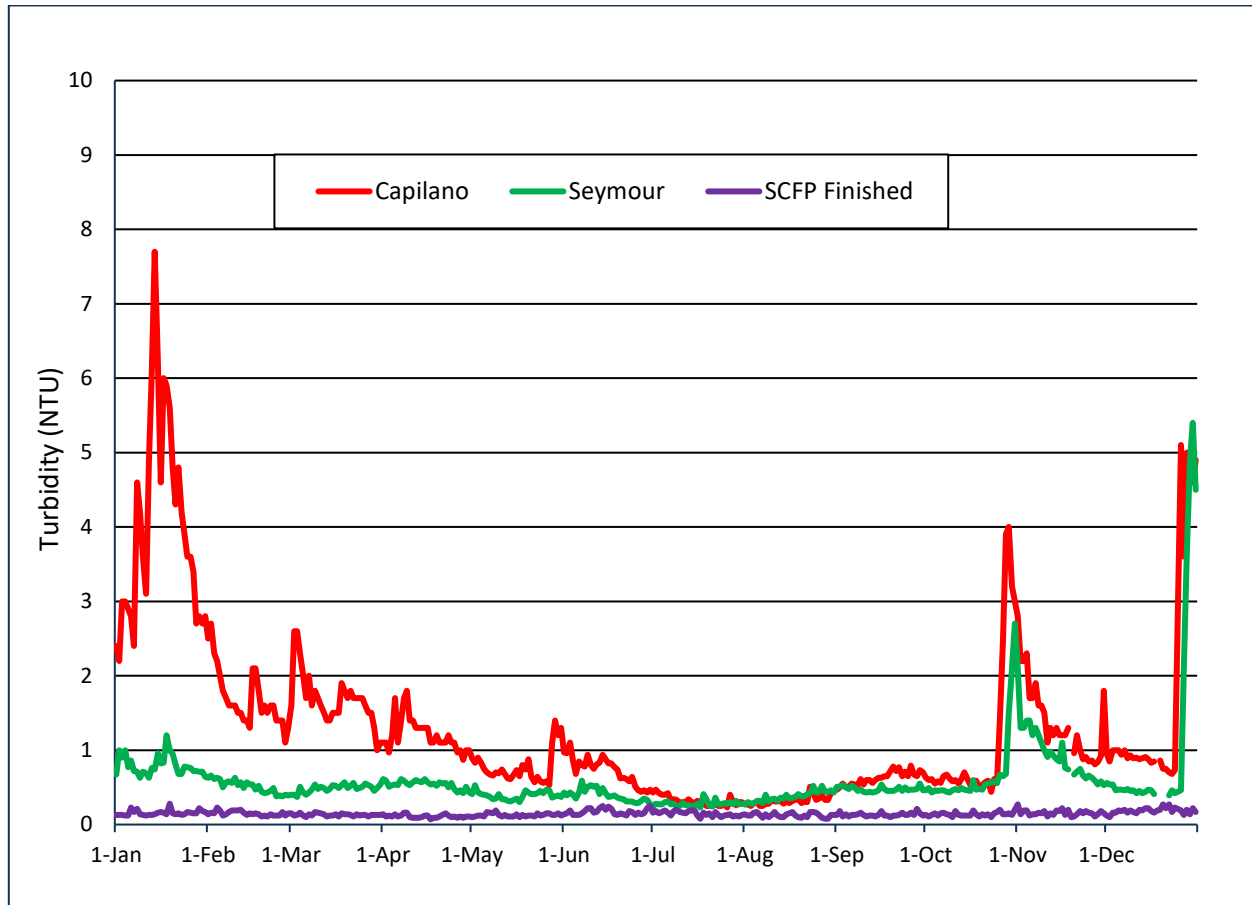


Figure 5: Average Daily Turbidity Levels Before and After Filtration

Removal of turbidity in 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 (2020) 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.”

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. This is summarized in Table 6. In 2022, there were no incidents where the IFE was greater than 1.0 NTU, and the few incidences of filter turbidity readings that were greater than 0.3 NTU were well within the 95% limit.

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	99.999%
February	0	100%
March	0	100%
April	0	99.999%
May	0	100%
June	0	100%
July	0	100%
August	0	100%
September	0	100%
October	0	100%
November	0	100%
December	0	99.999%

Table 6: Monthly Filter Effluent Turbidity Summary

Under normal operating conditions the average turbidity of the filtered water at SCFP was 0.15 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 Clearwells, where more than one hour of contact time is provided.

2.1.2. Ultraviolet Treatment

The effluent from each filter is treated with UV light as the water exits the filter. 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 ultraviolet 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 7 summarizes the performance of the SCFP UV system in 2022.

Month	Percent of Monthly Volume \geq 2-log of <i>Giardia</i> and <i>Cryptosporidium</i> Inactivation (95% of monthly volume required)
January	99.95%
February	99.97%
March	99.91%
April	99.83%
May	99.96%
June	99.94%
July	99.95%
August	99.94%
September	99.95%
October	99.97%
November	99.88%
December	99.96%

Table 7: Percent of Volume Meeting Ultraviolet Dosage Requirements at SCFP

2.1.3. Chlorination

Chlorination is used for disinfection at the source as well as at secondary disinfection stations to minimize bacterial regrowth in the GVWD transmission and member jurisdiction distribution systems. Chlorination provides 4-log virus inactivation with liquid sodium hypochlorite.

2.2. Coquitlam Water Treatment Plant

The Coquitlam Water Treatment Plant (CWTP) treats the Coquitlam source water using multiple disinfection barriers, specifically, ozone, UV and chlorine, and provides corrosion control. The Coquitlam source water is not filtered. Ozone contact is achieved in a stainless steel contactor pipeline that connects the Ozonation facility with the Corrosion Control and Chlorination facility. The primary function of ozonation is to improve the transmissivity of the water for subsequent UV light treatment and oxidize organic precursors responsible for the formation of disinfection by-products (DBPs) following chlorination.

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 carbon dioxide which is added to trim the pH once the desired alkalinity is reached. After chlorination, the finished water enters the transmission system. The quality of the water produced has been excellent leaving the CWTP.

2.2.1. Ozonation

Ozone is intended as a pre-treatment, however, also provides backup for inactivation of *Giardia* when the UV treatment system is offline. Ozonation also provides additional virus inactivation to chlorination. The ozonation system was fully operational for 99.3% of the time in 2022. The ozone outages in 2022 were due to a combination of electrical/instrument maintenance, ozone dosing test, and ozone generator faults or power loss.

2.2.2. Ultraviolet Treatment

UV light treatment provides for primary disinfection, and achieves 3-log inactivation of chlorine-resistant micro-organisms for *Giardia* and *Cryptosporidium*. The water is directed into 8 ultraviolet units, each containing 40 ultraviolet lamps encased in protective sleeves. Ultraviolet light emitted from the lamps passes through the water. The US Environmental Protection Agency (EPA)¹ 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 8. The EPA performance reference is used in the absence of a Canadian standard. There was no loss of UV in 2022 and 99.88% of the water volume was treated to the above specifications.

Month	Percent of Monthly Volume \geq 3-log <i>Giardia</i> and <i>Cryptosporidium</i> Inactivation (Minimum 95% Required)
January	99.88%
February	99.91%
March	99.89%
April	99.89%
May	99.85%
June	99.86%
July	99.88%
August	99.87%
September	99.91%
October	99.87%
November	99.83%
December	99.90%

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

¹ Ultraviolet Disinfection Guidance Manual for the Final Long Term2 Enhanced Surface Water Treatment Rule, November 2006, Sec. 1.4.4.

2.2.3. Chlorination

Chlorination is used for disinfection at the source as well as at secondary disinfection stations to minimize bacterial regrowth in the GVWD transmission and member jurisdiction distribution systems. Chlorination provides 4-log virus inactivation with liquid sodium hypochlorite solution. The chlorination system was fully operational 100% of the time in 2022.

2.3. Secondary Disinfection

There are 8 secondary disinfection stations operated by Metro Vancouver. The purpose of these stations is to increase the chlorine residual in the GVWD transmission and member jurisdiction distribution systems to meet a target residual based on a number of factors, including source water turbidity, the amount of bacterial regrowth detected in member jurisdiction 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 dose leaving the secondary facilities receiving SCFP water is 0.8 mg/L. These facilities frequently have an incoming chlorine residual high enough that boosting is not required. The target chlorine dose leaving the secondary facilities receiving CWTP water ranges from 1.20 to 1.50 mg/L.

Table 9 summarizes the performance of the secondary disinfection facilities in 2022.

Facility	Branch Main	Average Free Chlorine (mg/L)	Range of Free Chlorine (mg/L)	Source Water
Clayton	Whalley/Clayton	1.19	0.89-1.51	Supplied by CWTP water.
	Jericho/Clayton	1.20	0.98-1.50	
Chilco	Capilano No. 4 and No.5	0.74	0.56-0.83	Supplied by SCFP water.
Pitt River	Haney Main No.2	1.20	1.19-1.24	Supplied by CWTP water.
	Haney Main No.3	1.17	1.01-1.51	
Newton	Surrey Hickleton Main	1.08	0.51-1.39	Primarily supplied by SCFP water. Occasionally supplied by CWTP water, depending on flow demands.
Kersland	Capilano No. 4 and No.5	0.86	0.67-1.02	Supplied by SCFP water.
Central Park	South Burnaby Main No.1	0.77	0.53-0.98	Primarily supplied by SCFP water. Occasionally supplied by CWTP water, depending on flow demands.
	South Burnaby Main No.2	0.87	0.63-1.37	
Cape Horn	Coquitlam Main No.2	1.20	0.99-1.52	Supplied by CWTP water.
	Coquitlam Main No.3	1.21	0.97-1.53	
Vancouver Heights	Boundary Road Main No. 5	0.85	0.71-1.02	Supplied by SCFP water.

Table 9: Performance of Secondary Disinfection Facilities

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 current *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. The GCDWQ established.

The 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 hydrated lime (calcium hydroxide) to raise its pH and alkalinity before it enters the Clearwells. To achieve the desired alkalinity, the resultant pH is trimmed using CO₂ to bring it down to target levels.

At the Coquitlam source, the commissioning of the CO₂ system at the CWTP began in 2019, and was fully operational in 2021. The CO₂ system with the addition of soda ash (sodium carbonate) allows the GVWD to meet new target pH and alkalinity values across the entire system. Similar to the SCFP, the CO₂ system is used to trim the resultant pH to desired target levels.

The average pH of the treated water leaving SCFP and CWTP was 8.6 and 8.4, respectively, during 2022.

Performance of the corrosion control facilities is summarized in Table 10.

Facility	Performance	Discussion
SCFP Corrosion Control	pH ranged from 7.3 – 9.2	The annual average pH was 8.6 and was continually monitored with online instrumentation.
CWTP Corrosion Control	pH ranged from 6.7 – 10.1	<p>The annual average pH was 8.4.</p> <p>The pH was <7.0, the recommended lower limit of the GCDWQ, on January 1 for a total of 3 hours and August 2 for 2.5 hours, both times due to soda ash equipment fault.</p> <p>The pH never exceeded the recommended limit of 10.5 under the GCDWQ.</p>

Table 10: Performance of Corrosion Control Facilities

The chemical and physical characteristics of the GVWD treated water are summarized in Appendix B of this report and detailed analytical results are provided in Volume 2.

3.0 TRANSMISSION/DISTRIBUTION SYSTEM WATER QUALITY

Schedule A of the *BC Drinking Water Protection Regulation* (BCDWPR) contains 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 GVWD and its member jurisdictions. 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 1 sample is collected.

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

The BCDWPR 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 an *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).

The number of *E. coli* detected in both GVWD and member jurisdiction drinking water samples is typically very low. Out of more than 28,700 samples collected from GVWD and member jurisdiction systems analyzed in 2022, one sample was positive for *E. coli*. The detection of a positive *E. coli* sample triggers a protocol which involves immediate notification to health and member jurisdiction officials, re-sampling, and a thorough investigation into the possible causes. Three repeat samples were taken and no additional *E. coli* were found.

In the GVWD transmission system, only 12 out of the approximately 7,400 samples collected, tested positive for total coliforms. Only 20 of the approximately 21,300 samples collected from the member jurisdiction distribution systems tested positive for total coliforms in 2022. The majority of the coliforms (70%) in the member jurisdiction (and 67% in GVWD) systems appeared in the warmer water months of June through October.

The most likely source of these organisms is attributed to bacterial regrowth. It should be emphasized that 99.9% of the samples in 2022 had no coliforms present, which is a good indicator of effective water treatment and good transmission and 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 2022, there were approximately 4,000 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 very low, well below the 10% standard. Of the approximately 4,000 samples processed, 10 samples tested positive for total coliforms and no samples were positive for *E. coli* bacteria. The compliance of monitoring results from GVWD water mains with BCDWPR criteria is shown in Figure 6.

There were another 436 samples collected from stations where only chlorine residuals are measured. In addition, there are inline stations collecting chlorine data every 10-minutes after chlorination at each source, but these samples are not included in the calculations for compliance monitoring.

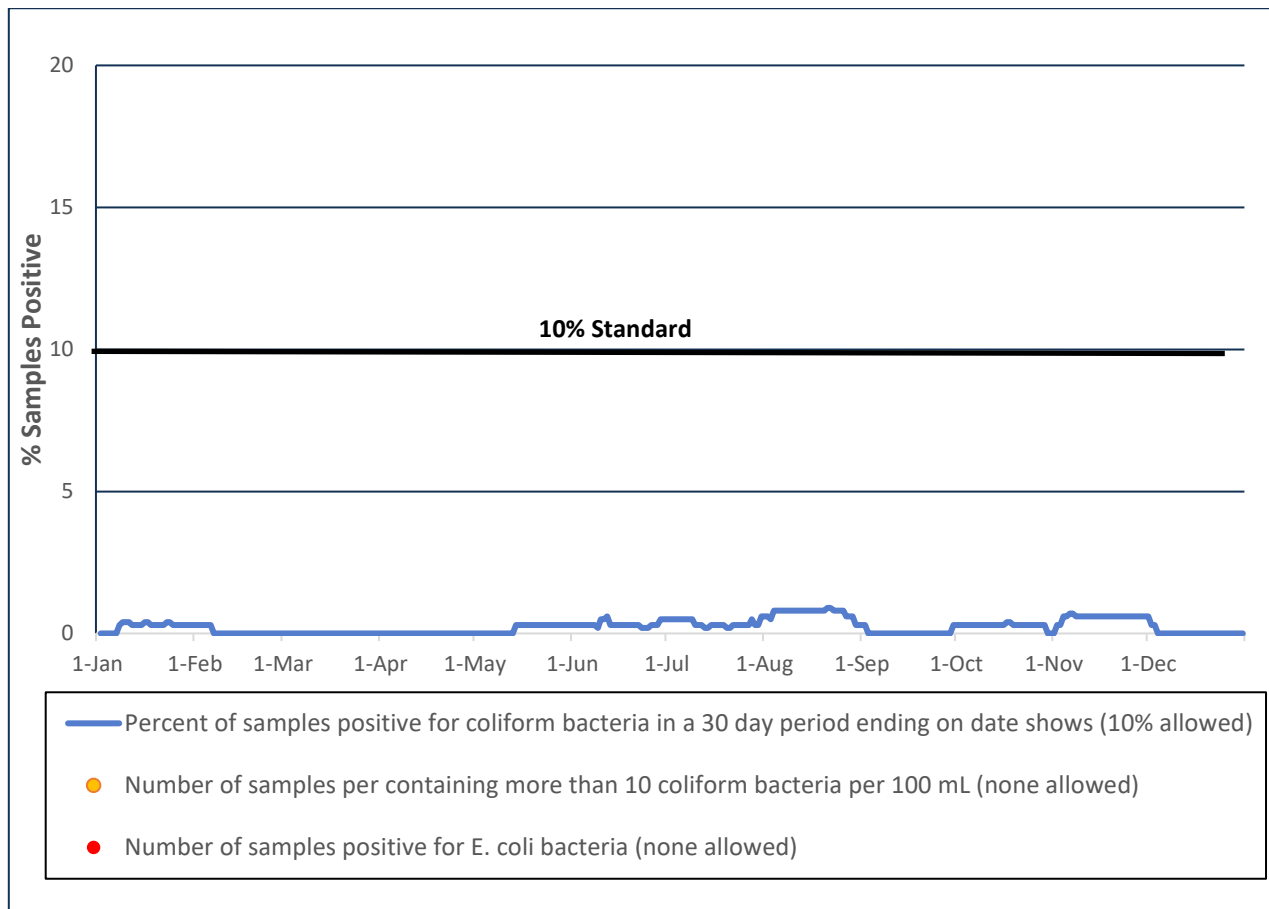


Figure 6: Bacteriological Quality of Water in GVWD Water Mains

3.1.2. GVWD In-System Reservoirs

In 2022, over 2,000 samples were collected from reservoirs that are located throughout the GVWD water system. Only 1 sample was positive for total coliforms. No sample from a reservoir was positive for *E. coli*.

The compliance of 2022 monitoring results from GVWD reservoirs with the criteria in the BCDWPR is shown in Figure 7.

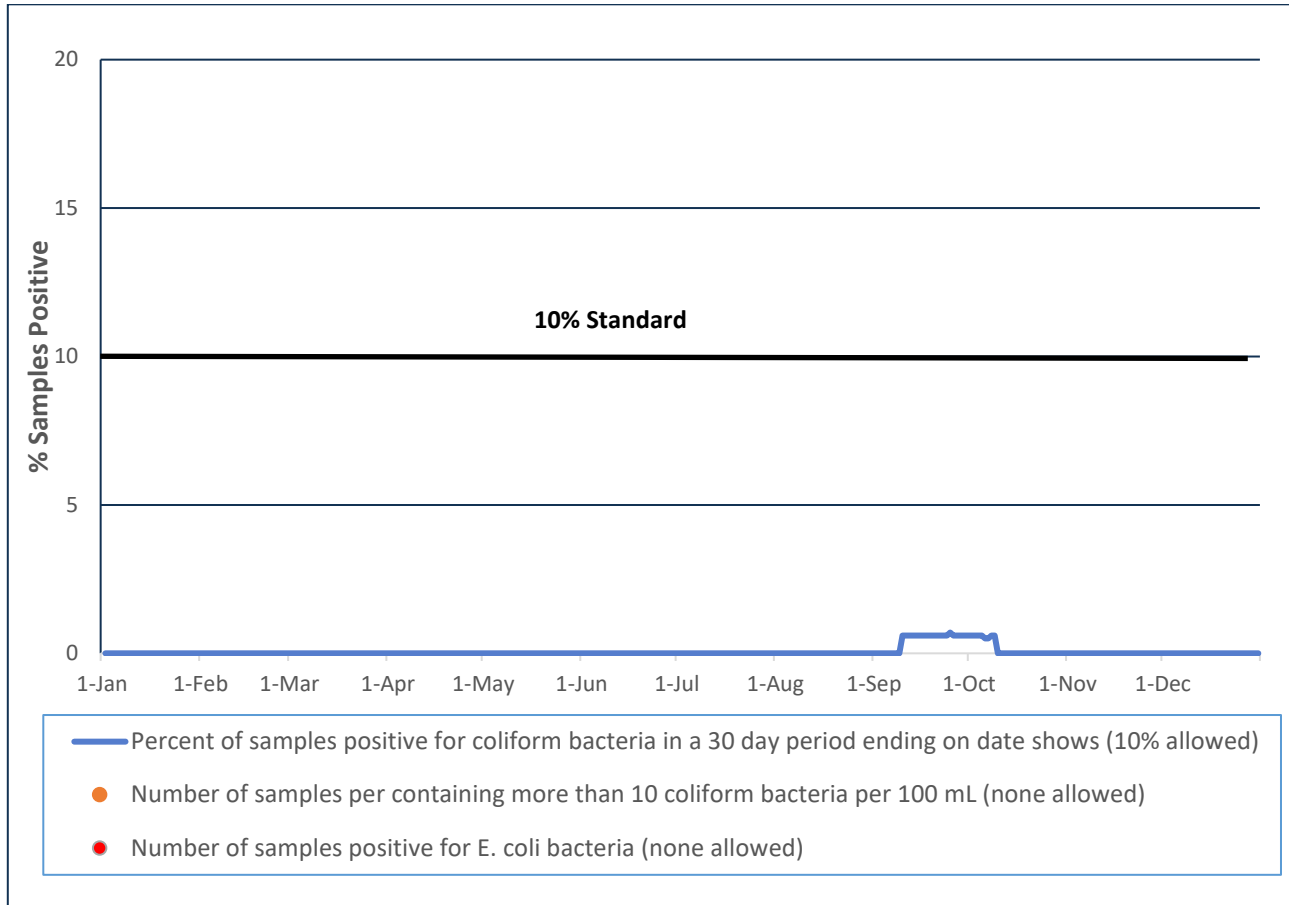


Figure 7: Bacteriological Quality of Water in GVWD In-System Reservoirs

Reservoir water quality is optimized by the use of secondary disinfection coupled with an active reservoir exercising program that includes a minimum of weekly monitoring of chlorine residuals and bacteriology results, which can result in changes to filling levels, if necessary.

Table 11 provides an overview of the status of the GVWD reservoirs from 2019 to 2022. During certain times of the year, it is not possible to cycle reservoirs as often as desired due to operational constraints. Despite these constraints, water quality as determined by coliform bacteria was satisfactory in all reservoirs.

Reservoir (Capacity in Million Litres)					Discussion
	2019	2020	2021	2022	
Burnaby Mountain Reservoir (13.2)	0.53	0.57	0.53	0.49	No operational issues
Burnaby Tank (2.3)	0.58	0.60	0.57	0.56	No operational issues
Cape Horn Reservoir (40.0)	0.61	0.78	0.71	0.78	No operational issues
Central Park Reservoir (35.0)	0.51	0.66	0.54	0.56	No operational issues
Clayton Reservoir (21.6)	1.02	1.08	1.1	1.05	To maintain water quality due to seasonal low demand, the cells of this reservoir are periodically removed from service. Cell 1 was in service Jan 1 - Nov 15 Cell 2 was in service March 16 - Dec 31
Glenmore Tanks (1.0)	0.68	0.77	0.73	0.67	No operational issues
Grandview Reservoir (13.5)	0.73	0.80	0.85	0.84	No operational issues
Greenwood Reservoir (8.8)	0.68	0.75	0.70	0.68	No operational issues
Hellings Tank (4.3)	0.48	0.54	0.56	0.52	No operational issues
Jericho Reservoir (20.0)	-	-	1.10	0.92	Cell 1 in service for entire year . Cell 2 not yet commissioned. Construction delays in 2022, anticipate completion in 2023.
Kennedy Reservoir (16.3)	0.52	0.58	0.65	0.60	No operational issues
Kersland Reservoir (73.7)	0.55	0.66	0.65	0.61	Following the completion of upgrades that were begun in Oct 2021, Cell No.1 was disinfected and returned to service in May. No operational issues with other cell.
Little Mountain Reservoir (171.0)	0.67	0.72	0.69	0.66	No operational issues
Maple Ridge Reservoir (20.0)	0.52	0.44	0.46	0.43	Reservoir was cleaned by divers in December.
Newton Reservoir (32.0)	0.46	0.55	0.44	0.64	Cell 2 was out of service beginning in March for inspection and preparatory work, it was then disinfected and returned to service on April 27. In October, the cell was once again removed from service for work on a new outlet structure. Work continued in 2023. During the fall outage, cell 1 operated at a lower level for worker safety in cell 2.
Pebble Hill Reservoir (42.2)	0.60	0.66	0.54	0.61	Cells 1 and 2 are being seismically upgraded. Work on Cell 1 that began in Fall 2021 continued in the spring until the cell was needed to meet the seasonal demands; after demand dropped, both Cells 1 & 2 were isolated and drained. Cell 1 was out of service Jan 1 - May 19. Oct 16 - Dec 31. Cell 2 was out of service Oct 16 - Dec 31.
Prospect Reservoir (4.4)	0.66	0.76	0.73	0.69	No operational issues
Sasamat Reservoir (26.0)	0.54	0.65	0.62	0.61	No operational issues

Reservoir (Capacity in Million Litres)					Discussion
	2019	2020	2021	2022	
Sunnyside Reservoir (22.7)	0.47	0.73	0.85	0.78	No operational issues
Vancouver Heights Reservoir (43.0)	0.75	0.82	0.78	0.71	No operational issues
Westburnco Reservoir (73.0)	0.58	0.64	0.60	0.65	No operational issues
Whalley Reservoir (33.4)	0.59	0.73	0.71	0.65	The reservoir was cleaned, disinfected and returned to service in April.

Table 11: Status of GVWD Reservoirs (2019-2022)

3.2. Microbiological Water Quality in Member Jurisdiction Systems

For samples collected from member jurisdiction systems, the percent positive per month for total coliform bacteria from 2019-2022 is shown in Figure 8.

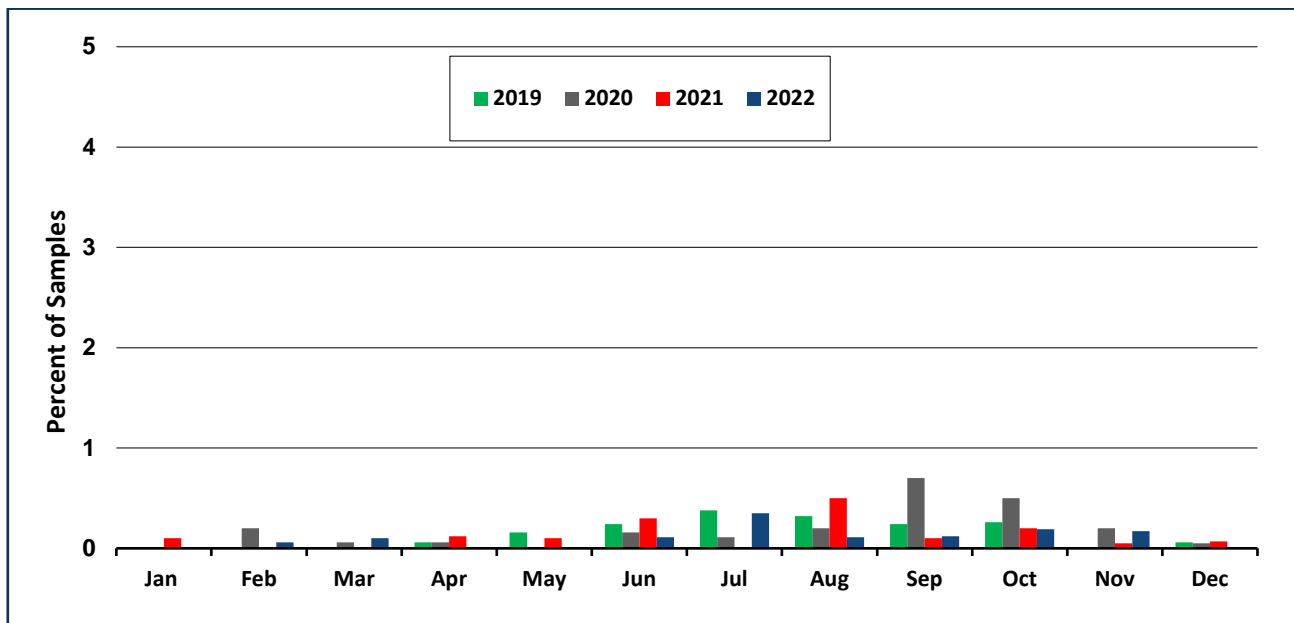


Figure 8: Percent of Samples per Month Positive for Total Coliform Bacteria (2019 to 2022)

The percentage of samples positive for total coliform bacteria in 2022 remained relatively similar as compared to 2021.

For Part 1 of the BCDWPR, no sample should be positive for *E. coli*. A single sample in July from member jurisdiction systems was positive *E. coli*. All subsequent samples taken over the following 3 days were negative.

For Part 3 no sample should contain more than 10 total coliform bacteria per 100 mL. For samples from member jurisdiction systems, this requirement was met in 2022 with the following exceptions:

- One sample in April contained more than 10 total coliform bacteria.
- One sample in July contained more than 10 total coliform bacteria.

Table 12 shows the compliance with the bacteriological standards (3 parts) in the BCDWPR for samples taken within the distribution systems of the 21 member jurisdictions that are supplied with GVWD water.

Month	Number that met Part 1	Number that met Part 2	Number that met Part 3	Number that met all requirements
January	21	21	21	21
February	21	21	21	21
March	21	21	21	21
April	21	21	20	20
May	21	21	21	21
June	21	21	21	21
July	20	21	20	20
August	21	21	21	21
September	21	21	21	21
October	21	21	21	21
November	21	21	21	21
December	21	21	21	21

Table 12: Member Jurisdiction Water Quality Compared to the Provincial Bacteriological Standards

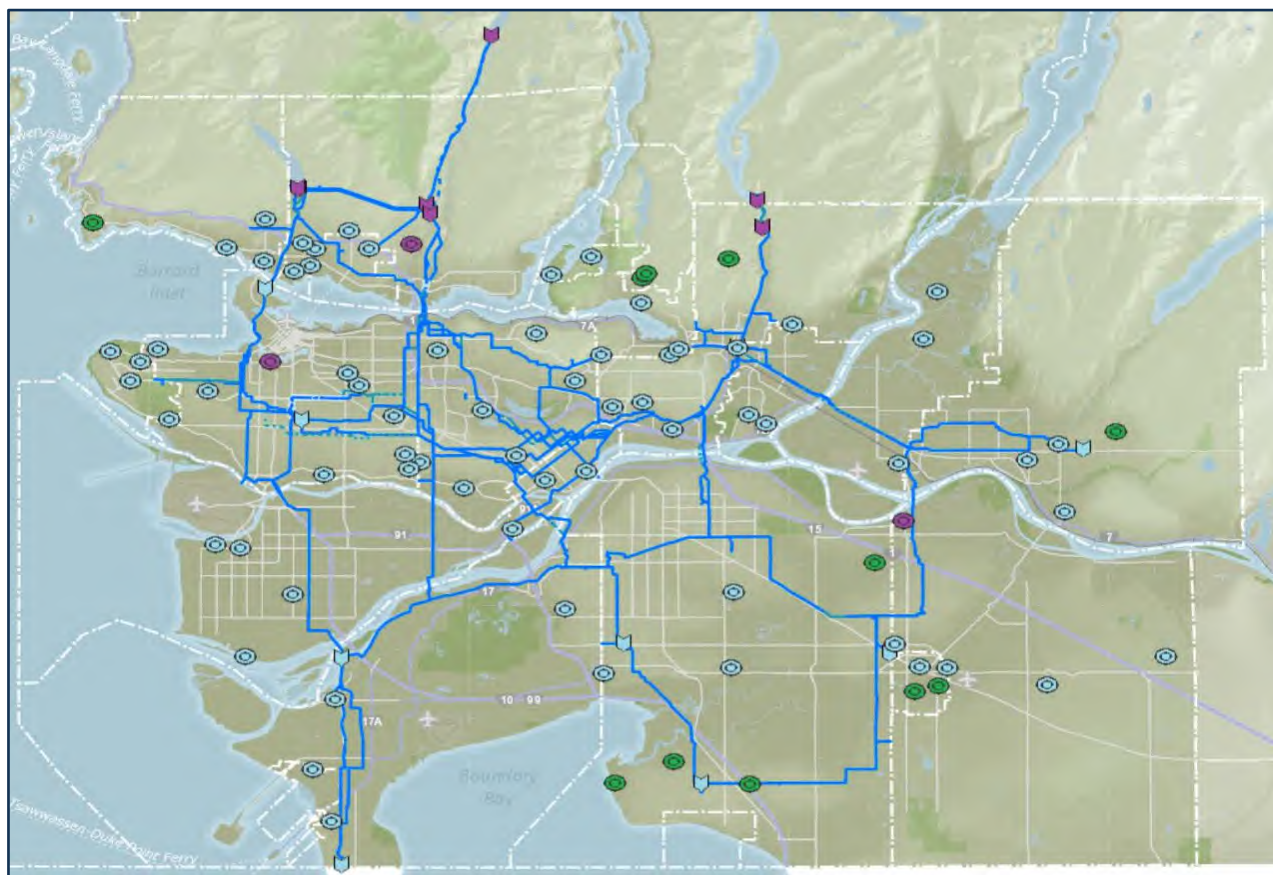
3.3. Disinfection By-Products in the Transmission/Distribution Systems

As the treated water moves through the GVWD Transmission system and into the member jurisdiction distribution system's infrastructure of water mains and reservoirs, changes in water quality occur. This is mainly due to the reaction between the chlorine in the water (added during primary and secondary disinfection) with naturally occurring organic matter in the water.

One of the most significant changes is the production of chlorinated DBPs. DBPs is a term used to describe a group of organic and inorganic compounds formed during water disinfection.

Reactions between dissolved natural organic matter and chlorine can lead to the formation of a variety of halogenated DBPs. There are two major groups of chlorinated DBPs: Total Trihalomethanes (TTHMs) and Total Haloacetic Acids (THAA). 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. In general, DBPs continue to form as long as chlorine and reactive DBP precursors are present in the water.

The Maximum Acceptable Concentration (MAC) in the GCDWQ for TTHMs is a locational yearly running average of 100 µg/L (0.1 mg/L) based on quarterly samples. A comparison of TTHM levels in the GVWD and member jurisdiction systems in 2022 is shown in Figure 9. All THM results from GVWD water mains and member jurisdiction systems were below the MAC of 100 µg/L.



2022 Average GVWD TTHM = 23 µg/L
 2022 Average Member Jurisdictions TTHM = 30 µg/L

Total Trihalomethane Levels - GVWD



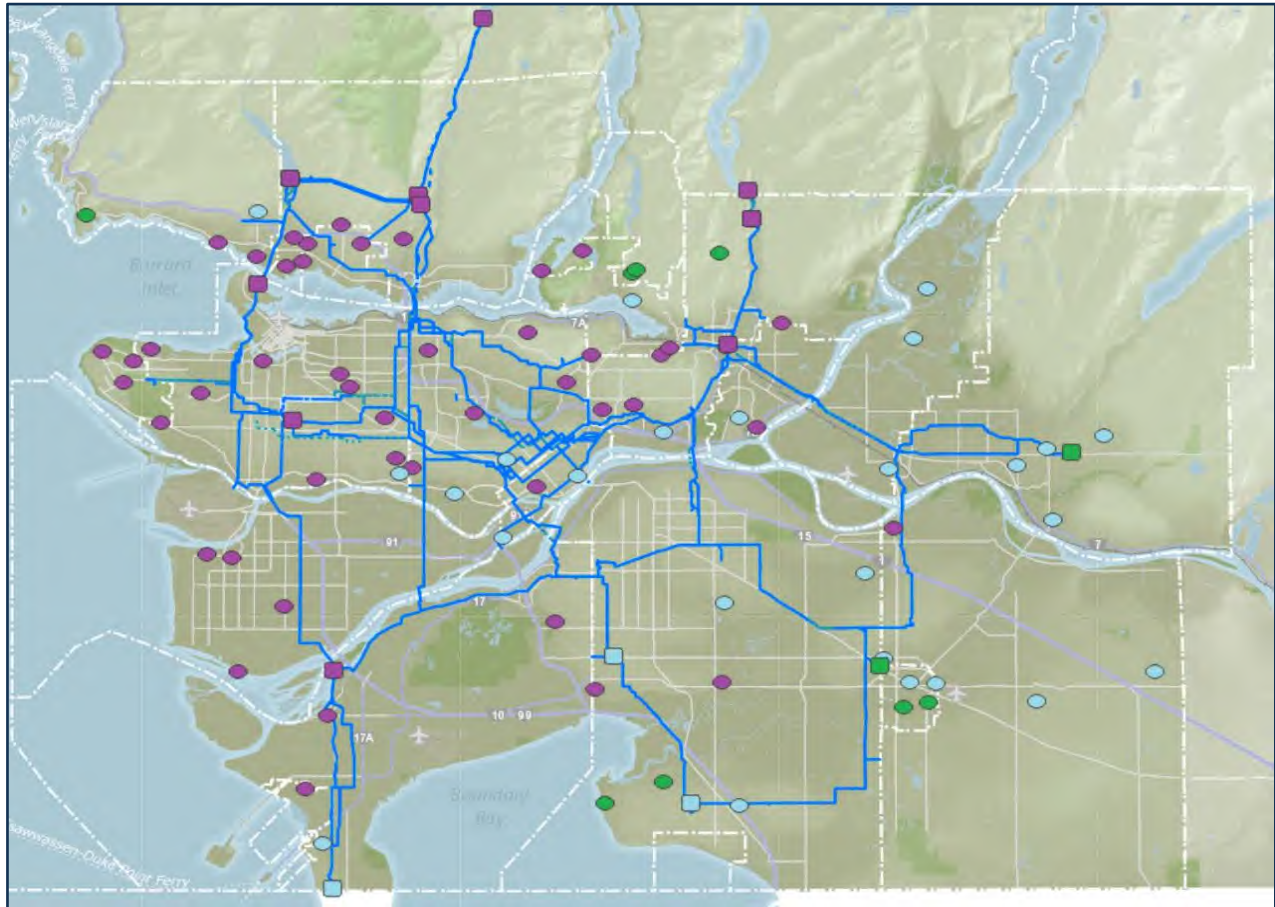
Total Trihalomethane Levels - Member Jurisdiction



MAC for Total Trihalomethane values is 100 µg/L

Figure 9: Average Total Trihalomethane Levels

The other group of disinfection by-products of interest is the Total Haloacetic Acid (THAA) group. Comparison of THAA in the GVWD and member jurisdiction systems in 2022 is shown in Figure 10. In 2022, all HAA results from GVWD water mains and member jurisdiction systems were below the MAC of 80 µg/L.



2022 Average GVWD THAA = 19 µg/L
 2022 Average Member Jurisdictions THAA = 23 µg/L

Total Haloacetic Acid Levels - GVWD



Total Haloacetic Acid Levels - Member Jurisdiction



MAC for Total Haloacetic Acid values is 80 µg/L

Figure 10: Average Total Haloacetic Acid Levels

4.0 QUALITY CONTROL/QUALITY ASSURANCE

Since 1994, the Metro Vancouver Microbiology Laboratory has participated in the BC Centre for Disease Control Public Health Laboratory Enhanced Water Quality Assurance Program and has been approved by the Provincial Medical Health Officer to perform microbiological analysis of drinking water as required in the BCDWPR. 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 carried out an inspection of the Metro Vancouver Microbiology Laboratory at the Lake City Operations Centre in September 2022 as part of the process leading up to approval of the laboratory by the Provincial Health Officer. The next inspection is planned for 2025.

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 *General requirements for the competence of testing and calibrations laboratories* international standard.

Representatives from CALA have assessed the Metro Vancouver Laboratories bi-annually since 1995. The most recent on-site audit took place in September 2021, and the Metro Vancouver Laboratories have been granted accreditation until 2024. The next CALA assessment will take place in the fall of 2023. The Scope of Accreditation is available on the CALA website – www.cala.ca.

APPENDIX A — WATER SAMPLING FREQUENCY

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Water Type	Parameter	Frequency
Untreated, Source Water	Total coliform and <i>E. coli</i>	Daily
	HPC	Daily
	Turbidity	Daily
	<i>Giardia</i> and <i>Cryptosporidium</i>	Monthly at Capilano, and Coquitlam. Seymour began in July 2022.
	Ammonia, colour, iron, organic carbon, pH	Weekly
	Alkalinity, chloride, calcium, hardness, magnesium, manganese, nitrate, potassium, phosphate, sulphate	Monthly
	Aluminum, copper, sodium, total and suspended solids	Bi-monthly
	THMs, HAAs	Quarterly
	Antimony, arsenic, barium, boron, cadmium, cyanide, chromium, lead, mercury, nickel, phenols, selenium, silver, zinc	Semi-annually
	Pesticides and herbicides	Annually
	PAHs, BTEX	Annually
	VOCs	Annually
	Radionuclides	Annually
Treated water	Total coliform and <i>E. coli</i>	Daily
	Turbidity	Daily
	Temperature	Daily
	pH	Daily
	Ammonia, colour, iron, organic carbon, aluminum at SCFP only	Weekly
	Aluminum, copper, sodium, total and suspended solids	Bi-Monthly
	THMs, HAAs	Quarterly at selected sites
	Antimony, arsenic, barium, boron, cadmium, cyanide, chromium, lead, mercury, nickel, phenols, selenium, silver, zinc	Semi-annually
GVWD Water Mains	Total coliform and <i>E. coli</i>	Weekly per site
	HPC	Weekly per site
	Free chlorine	Weekly per site
	THMs, HAAs, pH	Quarterly at selected sites
	PAHs, BTEX	Semi-annually at selected sites
GVWD Reservoirs	Total coliform and <i>E. coli</i>	Weekly per site
	HPC	Weekly per site
	Free chlorine	Weekly per site
	Turbidity	Weekly per site
Member Jurisdiction Distribution Systems	Total coliform and <i>E. coli</i>	Weekly per site
	HPC	Weekly per site
	Free chlorine	Weekly per site
	Turbidity	Weekly per site
	THMs, HAAs, pH	Quarterly at selected sites

APPENDIX B — CHEMICAL AND PHYSICAL ANALYSIS SUMMARIES

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Physical and Chemical Analysis of Water Supply

2022 – Capilano Water System

Parameter	Untreated ¹	Treated ¹		Canadian Guideline		
	Average	Average	Range	Days Exceeded	Limit ²	Reason Established
Alkalinity as CaCO ₃ (mg/L)	3.0	22	18-25	N/A	None	N/A
Aluminum Dissolved (µg/L)	59	26	20-35	N/A	None	N/A
Aluminum Total (µg/L)	126	29	18-51	0	2,900	Health
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)	2.4	2.8	2.5-3.5	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)	1,200	8,430	7,560-9,280	N/A	None	N/A
Carbon Organic - Dissolved (mg/L)	1.5	0.6	0.4-0.9	N/A	None	N/A
Carbon Organic - Total (mg/L)	1.5	0.6	0.4-0.9	N/A	None	N/A
Chlorate (µg/L)	<10	25	16-41	0	1000	Health
Chloride (mg/L)	<0.5	2.3	2.1-2.9	0	≤ 250	Aesthetic
Chromium Total (µg/L)	<0.08	<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)	15	<3	<2-14	N/A	None	N/A
Colour - True (TCU)	10	<1	<1-1	0	≤ 15	Aesthetic
Conductivity (µmhos/cm)	10	49	43-54	N/A	None	N/A
Copper Total (µg/L)	1.4	<0.5	<0.5	0/0	2,000/1,000	Health/Aesthetic
Cyanide Total (mg/L)	<0.02	<0.02	<0.02	0	0.2	Health
Cyanobacterial Toxins - Microcystin - LR (µg/L)	<0.20	N/A	N/A	0	1.5	Health
Fluoride (mg/L)	<0.05	<0.05	<0.05	0	1.5	Health
Haloacetic Acids Total (µg/L)	<1.1	10.4	9.5-12	0	80 (ALARA)	Health
Hardness as CaCO ₃ (mg/L)	3.7	22.0	20.3-24.0	N/A	None	N/A
Iron Dissolved (µg/L)	51	<5	<5-9	N/A	None	N/A
Iron Total (µg/L)	154	<9	<5-64	0	≤ 300	Aesthetic
Lead Total (µg/L)	<0.5	<0.5	<0.5	0	5 (ALARA)	Health
Magnesium Total (µg/L)	176	208	181-256	N/A	None	N/A
Manganese Dissolved (µg/L)	7.4	2.8	0.9-5.0	N/A	None	N/A
Manganese Total (µg/L)	8.9	6.0	2.4-10.6	0/0	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	None	N/A
Nickel Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
Nitrogen - Ammonia as N (mg/L)	<0.02	<0.02	<0.02	N/A	None	N/A
Nitrogen - Nitrate as N (mg/L)	0.08	0.07	0.02-0.17	0	10	Health
Nitrogen - Nitrite as N (mg/L)	<0.01	<0.01	<0.01	0	1	Health
pH (pH units)	6.5	8.0	7.8-8.4	0	7.0-10.5	None
Phenol (mg/L)	<0.005	<0.005	<0.005	N/A	None	N/A
Potassium Total (µg/L)	148	172	135-228	N/A	None	N/A
Residue Total (mg/L)	15	34	31-36	N/A	None	N/A
Residue Total Dissolved (TDS) (mg/L)	10	30	30-40	0	≤ 500	Aesthetic
Residue Total Fixed (mg/L)	9	27	25-30	N/A	None	N/A
Residue Total Volatile (mg/L)	6	7	5-9	N/A	None	N/A
Selenium Total (µg/L)	<0.5	<0.5	<0.5	0	50	Health
Silica as SiO ₂ (mg/L)	3.2	3.3	2.8-3.6	N/A	None	N/A
Silver Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
Sodium Total (µg/L)	591	1,570	1,380-1,820	0	≤ 200,000	Aesthetic
Trihalomethanes Total (µg/L)	<4	18	16-20	0	100	Health
Turbidity (NTU)	1.3	0.15	0.07-1.2	N/A	None ³	N/A
Uranium Total (µg/L)	0.0302	N/A	N/A	0	50	Health
UV Absorbance 254 nm (Abs/cm)	0.062	0.010	0.008-0.013	N/A	None	N/A
Zinc Total (µg/L)	<3	<3	<3-5	0	≤ 5,000	Aesthetic

¹Untreated water is sampled from the source intake. Treated water is sampled prior to entering the Capilano transmission system.

²Limits are taken from the Guidelines for Canadian Drinking Water Quality summary table (September 2022).

³GCDWQ recommends that water entering the distribution system have turbidity levels of 1.0 NTU or less.

Physical and Chemical Analysis of Water Supply

2022 – Seymour Water System

Parameter	Untreated ¹	Treated ¹		Canadian Guideline		
	Average	Average	Range	Days Exceeded	Limit ²	Reason Established
Alkalinity as CaCO ₃ (mg/L)	3.6	22	18-24	N/A	None	N/A
Aluminum Dissolved (µg/L)	48	25	19-34	N/A	None	N/A
Aluminum Total (µg/L)	87	30	18-55	0	2,900	Health
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)	2.9	2.8	2.5-3.5	0	1,000	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	5	Health
Calcium Total (µg/L)	1,620	8,450	7,520-9,240	N/A	None	N/A
Carbon Organic - Dissolved (mg/L)	1.3	0.6	0.5-1.0	N/A	None	N/A
Carbon Organic - Total (mg/L)	1.4	0.6	0.4-1.0	N/A	None	N/A
Chlorate (µg/L)	<10	23	13-40	0	1000	Health
Chloride (mg/L)	<0.5	2.3	2.1-2.9	0	≤250	Aesthetic
Chromium Total (µg/L)	<0.06	<0.06	<0.05-0.07	0	50	Health
Cobalt Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
Colour - Apparent (ACU)	14	<2	<2-6	N/A	None	N/A
Colour - True (TCU)	9	<1	<1-1	0	≤15	Aesthetic
Conductivity (µmhos/cm)	12	49	43-53	N/A	None	N/A
Copper Total (µg/L)	22.3	<2	<0.5-5.5	0/0	2,000/1,000	Health/Aesthetic
Cyanide Total (mg/L)	<0.02	<0.02	<0.02	0	0.2	Health
Cyanobacterial Toxins - Microcystin - LR (µg/L)	<0.20	N/A	N/A	0	1.5	Health
Fluoride (mg/L)	<0.05	<0.05	<0.05	0	1.5	Health
Haloacetic Acids Total (µg/L)	<1.1	11.7	7.8-19	0	80 (ALARA)	Health
Hardness as CaCO ₃ (mg/L)	4.7	21.9	19.5-23.9	N/A	None	N/A
Iron Dissolved (µg/L)	74	<5	<5-7	N/A	None	N/A
Iron Total (µg/L)	168	<9	<5-22	0	≤300	Aesthetic
Lead Total (µg/L)	<0.5	<0.5	<0.5	0	5 (ALARA)	Health
Magnesium Total (µg/L)	153	210	180-266	N/A	None	N/A
Manganese Dissolved (µg/L)	5.6	3.5	1.1-6.1	N/A	None	N/A
Manganese Total (µg/L)	8.8	6.5	2.7-12.8	0	≤50	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	None	N/A
Nickel Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
Nitrogen - Ammonia as N (mg/L)	<0.02	<0.02	<0.02	N/A	None	N/A
Nitrogen - Nitrate as N (mg/L)	0.06	0.07	0.02-0.17	0	45	Health
Nitrogen - Nitrite as N (mg/L)	<0.01	<0.01	<0.01	0	1	Health
pH (pH units)	6.5	8.0	7.7-8.3	0	7.0-10.5	None
Phenol (mg/L)	<0.005	<0.005	<0.005	N/A	None	N/A
Potassium Total (µg/L)	156	170	137-226	N/A	None	N/A
Residue Total (mg/L)	16	34	31-36	N/A	None	N/A
Residue Total Dissolved (TDS) (mg/L)	10	30	30-40	0	≤500	Aesthetic
Residue Total Fixed (mg/L)	9	27	25-30	N/A	None	N/A
Residue Total Volatile (mg/L)	6	7	5-8	N/A	None	N/A
Selenium Total (µg/L)	<0.5	<0.5	<0.5	0	50	Health
Silica as SiO ₂ (mg/L)	3.2	3.3	2.8-3.6	N/A	None	N/A
Silver Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
Sodium Total (µg/L)	558	1,550	1,390-1,810	0	≤200,000	Aesthetic
Trihalomethanes Total (µg/L)	<4	16	16-17	0	100	Health
Turbidity (NTU)	0.58	0.15	0.07-0.28	N/A	None ³	N/A
Uranium Total (µg/L)	0.0198	N/A	N/A	0	50	Health
UV Absorbance 254 nm (Abs/cm)	0.058	0.010	0.008-0.015	N/A	None	N/A
Zinc Total (µg/L)	<5	<3	<3-3	0	≤5,000	Aesthetic

¹Untreated water is sampled prior to the SCFP. Treated water is sampled prior to entering the Seymour transmission system.

²Limits are taken from the Guidelines for Canadian Drinking Water Quality summary table (September 2022).

³GCDWQ recommends that water entering the distribution system have turbidity levels of 1.0 NTU or less.

Physical and Chemical Analysis of Water Supply

2022 – Coquitlam Water System

Parameter	Untreated ¹	Treated ¹		Canadian Guideline		
	Average	Average	Range	Days Exceeded	Limit ²	Reason Established
Alkalinity as CaCO ₃ (mg/L)	1.9	21	20-26	N/A	None	N/A
Aluminum Dissolved (µg/L)	59	68	51-85	N/A	None	N/A
Aluminum Total (µg/L)	81	83	61-106	0	2,900	Health
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 ¹	Health
Barium Total (µg/L)	2.6	2.4	1.7-3.6	0	1,000	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		None	N/A
Cadmium Total (µg/L)	<0.2	<0.2	<0.2	0	5	Health
Calcium Total (µg/L)	807	911	706-2,300	N/A	None	N/A
Carbon Organic - Dissolved (mg/L)	1.5	1.4	1.1-2.0	N/A	None	N/A
Carbon Organic - Total (mg/L)	1.6	1.4	1.2-2.1	N/A	None	N/A
Chlorate (µg/L)	<10	52	32-85	0	1,000	Health
Chloride (mg/L)	<0.5	2.1	1.9-2.3	0	≤250	Aesthetic
Chromium Total (µg/L)	<0.06	<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	<3	<2-8	N/A	None	N/A
Colour - True (TCU)	9	<1	<1-6	0	≤15	Aesthetic
Conductivity (µmhos/cm)	8	45	40-53	N/A	None	N/A
Copper Total (µg/L)	4.4	<0.5	<0.5	0/0	2,000/1,000	Health/Aesthetic
Cyanide Total (mg/L)	<0.02	<0.02	<0.02	0	0.2	Health
Cyanobacterial Toxins - Microcystin - LR (µg/L)	<0.20	N/A	N/A	0	1.5	Health
Fluoride (mg/L)	<0.05	<0.05	<0.05	0	1.5	Health
Haloacetic Acids Total (µg/L)	<1.1	7.4	4.2-12	0	80 ¹	Health
Hardness as CaCO ₃ (mg/L)	2.4	2.7	2.1-6.2	N/A	None	N/A
Iron Dissolved (µg/L)	18	19	12-35	N/A	None	N/A
Iron Total (µg/L)	48	49	25-76	0	≤300	Aesthetic
Lead Total (µg/L)	<0.5	<0.5	<0.5	0	5 ¹	Health
Magnesium Total (µg/L)	93	94	77-110	N/A	None	N/A
Manganese Dissolved (µg/L)	3.9	2.7	1.6-3.7	N/A	None	N/A
Manganese Total (µg/L)	4.4	3.6	2.0-4.8	0	≤50	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	None	N/A
Nickel Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
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	0.08	0.04-0.11	0	45	Health
Nitrogen - Nitrite as N (mg/L)	<0.01	<0.01	<0.01	0	1	Health
pH (pH units)	6.3	8.2	7.6-8.9	0		None
Phenol (mg/L)	<0.005	<0.005	<0.005	N/A	None	N/A
Potassium Total (µg/L)	147	144	102-234	N/A	None	N/A
Residue Total (mg/L)	12	35	33-37	N/A	None	N/A
Residue Total Dissolved (TDS) (mg/L)	9	30	30	0	≤500	Aesthetic
Residue Total Fixed (mg/L)	6	23	20-24	N/A	None	N/A
Residue Total Volatile (mg/L)	6	12	9-14	N/A	None	N/A
Selenium Total (µg/L)	<0.5	<0.5	<0.5	0	50	Health
Silica as SiO ₂ (mg/L)	2.4	2.4	2.2-2.5	N/A	None	N/A
Silver Total (µg/L)	<0.5	<0.5	<0.5	N/A	None	N/A
Sodium Total (µg/L)	448	10,300	9,000-11,100	0	≤200,000	Aesthetic
Trihalomethanes Total (µg/L)	<4	8	6-12	0	100	Health
Turbidity (NTU)	<0.4	0.36	0.13-4.5	N/A	None ³	N/A
Uranium Total (µg/L)	0.0491	N/A	N/A	0	50	Health
UV 254 - Apparent (Abs/cm)	0.065	0.023	0.016-0.057	N/A	None	N/A
UV Absorbance 254 nm (Abs/cm)	0.059	0.020	0.013-0.050	N/A	None	N/A
Zinc Total (µg/L)	<3	<3	<3-5	0	≤5,000	Aesthetic

¹Untreated water is sampled from the source intake. Treated water is sampled prior to entering the Coquitlam transmission system.

²Limits are taken from the Guidelines for Canadian Drinking Water Quality summary table (September 2022).

³GCDWQ recommends that water entering the distribution system have turbidity levels of 1.0 NTU or less.

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

Parameter	Capilano (µg/L)	Seymour (µg/L)	Coquitlam (µg/L)	MAC (µg/L)	AO (µg/L)
	Jul 26	Jul 26	Jul 26		
Herbicides					
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
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	190	None
Metolachlor	<0.50	<0.50	<0.50	None	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					
2,3,4,6-tetrachlorophenol	<0.50	<0.50	<0.50	None	None
2,4,6-trichlorophenol	<0.50	<0.50	<0.50	5	≤2
2,4-dichlorophenol	<0.25	<0.25	<0.25	None	None
Pentachlorophenol	<0.50	<0.50	<0.50	60	≤30

Analysis of Source Waters for Herbicides, Pesticides, and other Organic Compounds Con't.

Parameter	Capilano (µg/L)	Seymour (µg/L)	Coquitlam (µg/L)	MAC (µg/L)	AO (µg/L)
	Jul 26	Jul 26	Jul 26		
Volatile Organics					
1,1-dichloroethene	<0.50	<0.50	<0.50	14	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-butylether (MTBE)	<4.0	<4.0	<4.0	None	≤15
Tetrachloroethene	<0.50	<0.50	<0.50	10	N/A
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
Miscellaneous					
Nitritotriacetic Acid : Nitritotriacetic acid (NTA) (mg/L)	<0.050	<0.050	<0.050	0.4 mg/L	None
N-Nitrosodimethylamine (NDMA) (ng/L)	<2.2	<2.2	<2.1	40 ng/L	None

Monitoring of Selected GVWD Water Mains for BTEX

Parameter	Maple Ridge Main		Barnston Island Main at Willoughby Pump Station		Jericho Clayton Main		South Burnaby Main No. 2		MAC (µg/L)	AO (µg/L)
	(µg/L)		(µg/L)		(µg/L)		(µg/L)			
	May 16	Dec 1	May 17	Dec 8	May 17	Dec 1	May 17	Nov 29		
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	90	20
Total BTEX	<1	2	1	1	<1	2	<1	1	None	None

Analysis of Source Water for PAHs

Parameter	Capilano (µg/L)			Seymour (µg/L)			Coquitlam (µg/L)		
	May 16	Jul 26	Nov 29	May 16	Jul 26	Nov 28	May 16	Jul 26	Dec 1
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	<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
Benzo(b&j)fluoranthene	<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	<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
Dibenz(a,h)anthracene	<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	<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

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 Selected GVWD Mains for PAHs

Parameters	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)	
	May 16	Nov 30	May 17	Dec 1	May 17	Dec 1	May 16	Nov 29	May 17	Dec 6	May 16	Dec 1	May 17	Dec 2
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	<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	<0.020	0.028	<0.020	<0.020	<0.020	<0.020	0.021	<0.020	0.023	<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	<0.10	<0.10	<0.10	<0.10	<0.10

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

Parameter	Capilano (Bq/L)	Seymour (Bq/L)	Coquitlam (Bq/L)	MAC (Bq/L)
	Jul 26	Jul 26	Jul 26	
Gross Alpha	<0.10	<0.10	<0.10	0.5
Gross Beta	<0.10	<0.10	<0.10	1
Cesium-134	<1	<1	<1	None
Cesium-137	<1	<1	<1	10
Iodine-131	<1	<1	<1	6
Lead-210	<0.10	<0.10	<0.10	0.2
Manganese-54	<1	<1	<1	None
Radium 226	<0.010	<0.010	<0.010	0.5
Radon-222	<10	<10	<10	None
Strontium-90	<0.10	<0.10	<0.10	7
Tritium	<20	<20	<20	7,000
Zinc-65	<1	<1	<1	None

APPENDIX D — METRO VANCOUVER DETECTION OF WATERBORNE *CRYPTOSPORIDIUM* AND *GIARDIA* JANUARY - DECEMBER 2022 ANNUAL REPORT

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Metro Vancouver

Detection of Waterborne *Cryptosporidium* and *Giardia*

January - December, 2022

Annual Report

February 2023

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Environmental Microbiology
BCCDC Public Health Laboratory
Provincial Health Services Authority

Metro Vancouver

Detection of Waterborne *Cryptosporidium* and *Giardia*

January - December 2022 Annual Report

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

Cryptosporidium and *Giardia* species are parasites that infect the intestinal tracts of a wide range of warm-blooded animals. In humans, infection with *Cryptosporidium* species or *Giardia lamblia* can cause gastroenteritis. Since *Cryptosporidium* oocysts and *Giardia* cysts are resistant to chlorination, they are of great concern for drinking water purveyors (1-3). 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. All sample collection, testing, analysis and reporting occurred on a monthly basis using a validated method.

Methods

The Environmental Microbiology Laboratory at BCCDC PHL follows 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 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 the Metro Vancouver at specific sampling sites at the reservoirs and filtration plants on the scheduled date each month. A desired volume of samples were filtered in the field using Pall Life Science Envirochek HV filters. After collection and 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 testing was also performed at scheduled collection periods, annually for baseline assessment.

Results & Discussions

In 2022, 41 sample filters (excluding matrix spikes) were examined in total. These include:

- 12 Envirochek HV filters from Capilano reservoir
- 12 Envirochek HV filters from Coquitlam reservoir
- 12 Envirochek HV filters from SCFP-RCW
- 5 Envirocheck HV filters from Seymour reservoir

Table 1 and Figures 1-3 show the summary of all results. Detailed results per collection site can be found in Tables A1-A4 in Appendix A.

	Capilano Reservoir		Coquitlam Reservoir		Seymour Capilano Filtration Plant – Recycled Clarified Water		Seymour Reservoir	
# of Filter Tested	12		12		12		5	
Average volume (L) Filtered per Month	48.3		49.6		279.9		39.2	
Average Detection Limit (oo)cysts per 100 L	<2.0		<2.0		0.66		2.69	
	Cryptosporidium	Giardia	Cryptosporidium	Giardia	Cryptosporidium	Giardia	Cryptosporidium	Giardia
# Positive Filters	0	2	0	1	0	0	0	0
% Positive Filters	0%	17%	0%	8%	0%	0%	0%	0%
Max Count (oo)cysts per 100 L	0	2	0	2	0	0	0	0

Table 1. Metro Vancouver Filter Result Summary in 2022

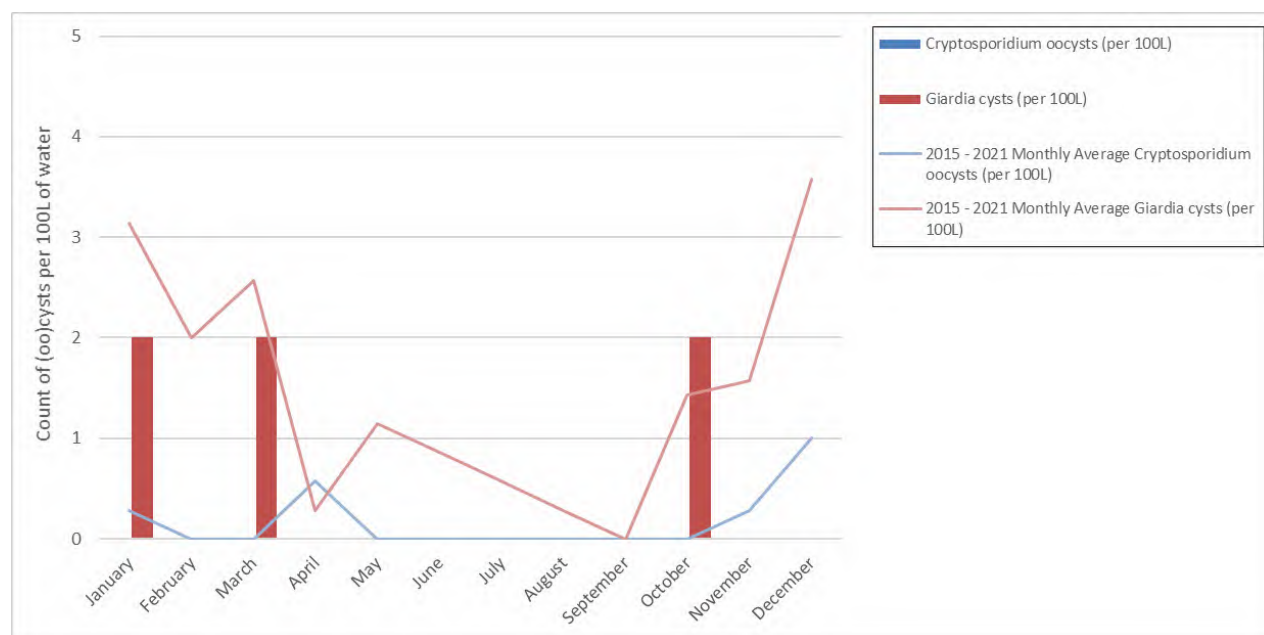


Figure 1. Capilano Reservoir *Cryptosporidium* Oocysts and *Giardia* Cysts Counts per 100 Litres of Raw Water in 2022

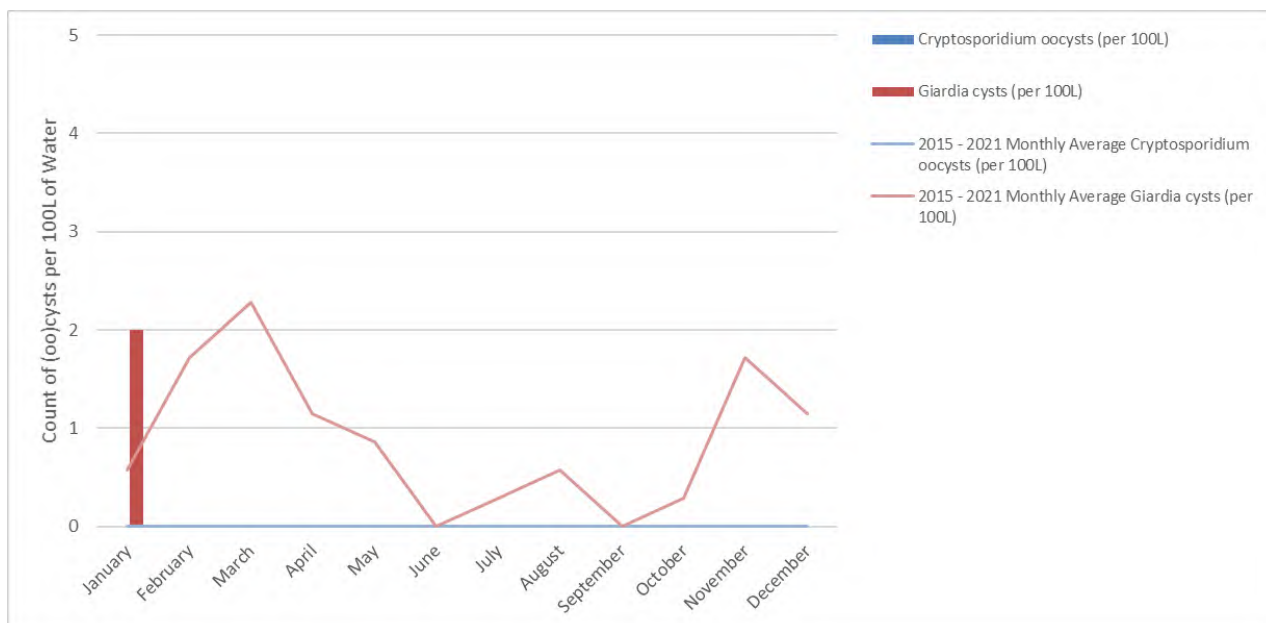


Figure 2: Coquitlam Reservoir *Cryptosporidium* Oocysts and *Giardia* Cysts Counts per 100 Litres of Raw Water in 2022

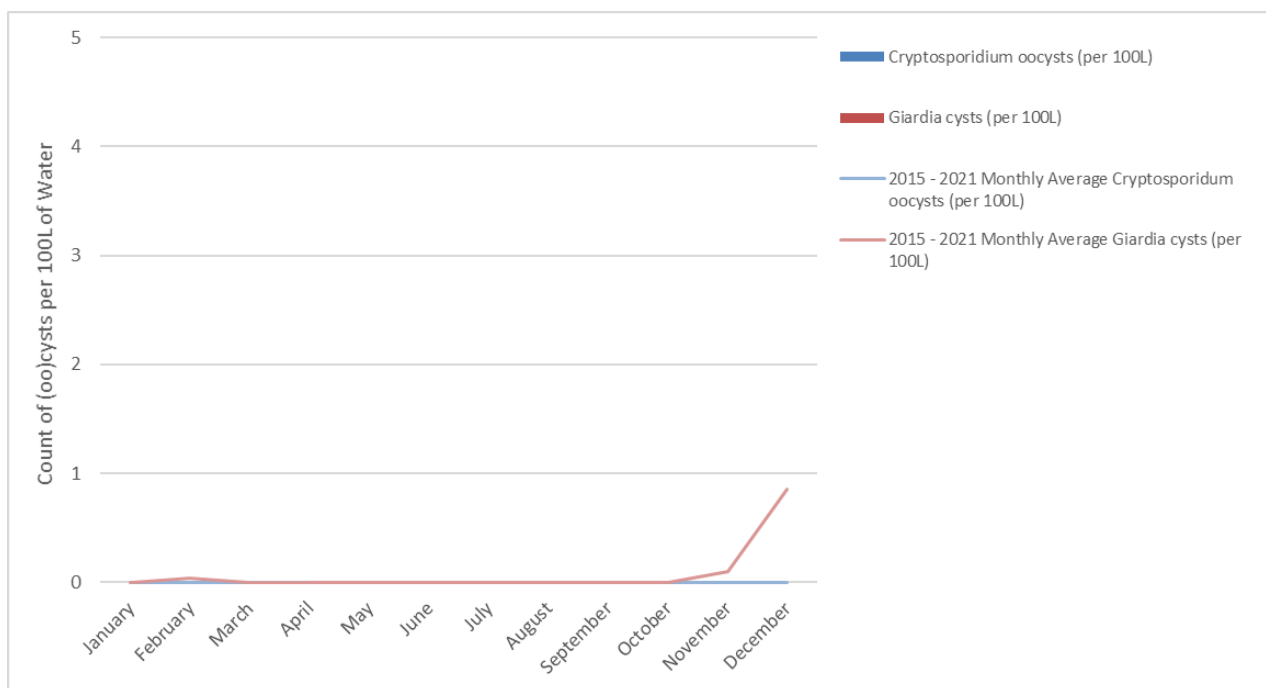


Figure 3: Seymour Capilano Filtration Plant - Recycled Clarified Water *Cryptosporidium* Oocysts and *Giardia* Cysts Counts per 100 Litres of Raw Water in 2022

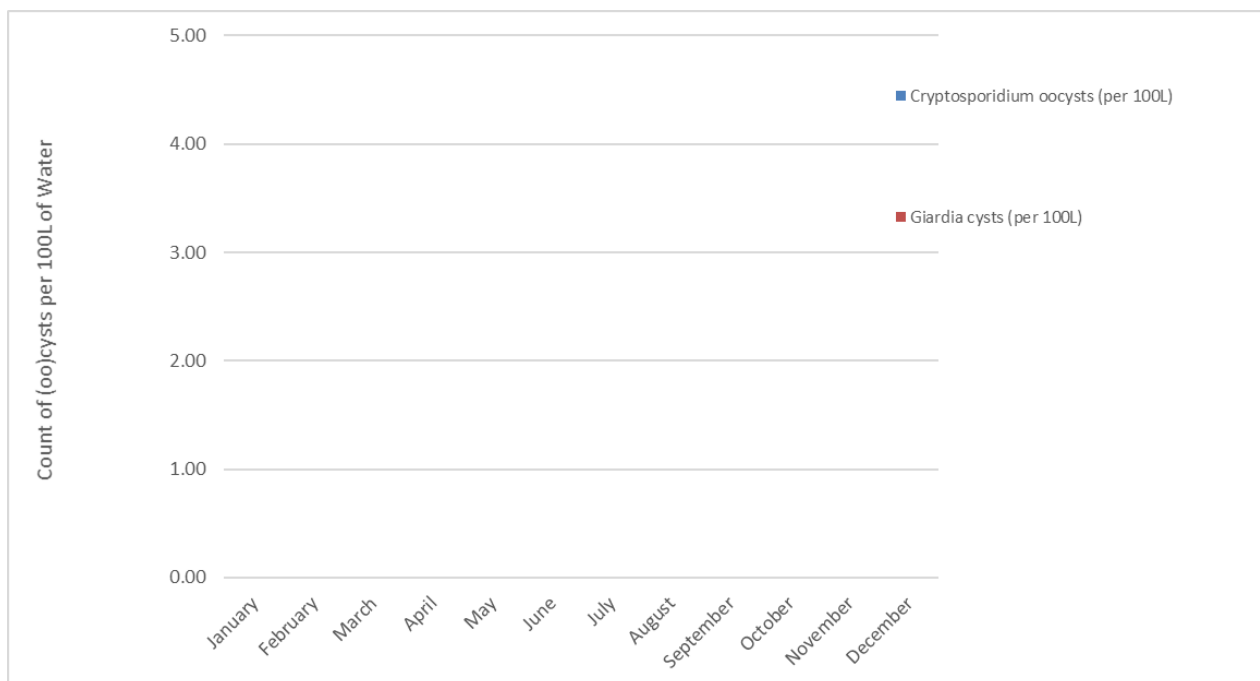


Figure 4: Seymour Reservoir *Cryptosporidium* Oocysts and *Giardia* Cysts Counts per 100 Litres of Raw Water in 2022

Overall, similar trends were observed for both *Cryptosporidium* and *Giardia* in 2022, in comparison to historical data in 2015-2021. Testing for Seymour reservoir started in July 2022, therefore there is no historical data for comparison. There were no detections of *Cryptosporidium* or *Giardia* at this site in 2022.

DAPI staining is used as part of the confirmation of the internal structure of *Cryptosporidium* oocysts and *Giardia* cysts. DIC microscopy is used primarily for *Cryptosporidium* oocyst and *Giardia* cyst confirmation but it can also serve 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 indicating that the cysts were not empty and could be viable.

Summary of morphological results are listed in Tables 2 and 3. Detailed results for staining by IFA, DAPI and internal morphology, as determined through DIC microscopy, for every identified cyst and oocyst were recorded in Tables A5-A12 in Appendix A.

Site	Count of oocysts	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
Capilano	0	0	0	0	0	0	0
		0.0%	0.0%		0.0%	0.0%	0.0%
Coquitlam	0	0	0	0	0	0	0
		0.0%	0.0%		0.0%	0.0%	0.0%
SCFP-RCW	0	0	0	0	0	0	0
		0.0%	0.0%		0.0%	0.0%	0.0%
Seymour	0	0	0	0	0	0	0
		0.0%	0.0%		0.0%	0.0%	0.0%

Table 2. 2022 Summary of morphological results for *Cryptosporidium* oocysts observed under fluorescence microscope

Site	Count of cysts	DAPI -	DAPI +		DIC				
		Light blue internal staining, no distinct	Intense blue internal staining	Nuclei stained sky blue	Empty cysts	Cysts with amorphous structure	Cysts with internal structure		
							Nuclei	Median Body	Axoneme
Capilano	2	1	1	0	0	2	0	0	0
		50.0%	50.0%		0.0%	100.0%		0.0%	0.0%
Coquitlam	1	0	0	3	0	0	1	0	0
		0.0%	0.0%		0.0%	0.0%		0.0%	0.0%
SCFP-RCW	0	0	0	0	0	0	0	0	0
		0.0%	0.0%		0.0%	0.0%		0.0%	0.0%
Seymour	0	0	0	0	0	0	0	0	0
		0.0%	0.0%		0.0%	0.0%		0.0%	0.0%

Table 3: 2022 Summary of morphological results for *Giardia* cysts observed under fluorescence microscope

DAPI staining is used as an indicator of nuclei integrity by staining the DNA. It can also approximate oocysts/cysts integrity; the absence of nuclei is indicative of an aged, damaged or non-infective cell. A number of oocysts and cysts observed across all sites had no visible nuclei indicating that they were aged and likely subjected to environmental degradation (Table 4). However, they were likely in previous infective state.

Number of Nuclei per (oo)cyst	0*	1	2	3	4	Total # of (oo)cysts
<i>Cryptosporidium</i> oocysts						
Capilano	0	0	0	0	0	0
Coquitlam	0	0	0	0	0	0
SCFP-RCW	0	0	0	0	0	0
<i>Giardia</i> cysts						
Capilano	2	0	0	0	0	2
Coquitlam	0	0	0	1	0	1
SCFP-RCW	0	0	0	0	0	0

Table 4: 2022 Number of nuclei in each *Cryptosporidium* oocysts and *Giardia* cysts. *DAPI negative or only intense blue internal staining.

Due to the variations of water chemistry and organic matters between geographical area and temporally within each sampling sites, a matrix spike is performed annually to provide recovery rate estimation from each site. The results of the matrix spike recovery (2007-2022) are compiled 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.

Matrix testing in 2022 was completed in both summer and winter on two separate sampling events at each site. 50L were provided from each site and the percentage recovery for *Cryptosporidium* oocysts and *Giardia* cysts and were noted in Table 5. One of the carboys containing 10L of matrix water from Capilano reservoir leaked in transit and was not used in testing; therefore the Capilano 2022 Fall/Winter matrix testing was performed with only 40L of water.

Year	Capilano		Coquitlam		SCFP - Recycled Clarified Water		Seymour	
	<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%	17.0%	13.0%	not collected	
2011	27.0%	44.0%	22.0%	47.0%	1.0%	0.0%	not collected	
2012	38.4%	76.5%	35.0%	49.0%	7.0%	13.7%	not collected	
2013	22.4%	59.4%	16.3%	64.4%	6.1%	14.9%	not collected	
2014	not collected		55.0%	39.4%	18.0%	14.1%	not collected	
2015	26.3%	40.4%	2.0%	60.6%	9.1%	26.5%	not collected	
2016	35.4%	47.5%	22.2%	50.5%	9.1%	14.0%	not collected	
2017	20.2%	38.4%	22.2%	21.2%	0.0%	2.0%	not collected	
2018	43.4%	75.8%	17.1%	59.6%	1.0%	11.1%	not collected	
2019	0.0%	43.0%	1.0%	55.0%	0.0%	4.1%	not collected	
2020	5.1%	37.4%	8.1%	59.8%	0.0%	4.0%	not collected	
2021 June	2.0%	53.0%	0.0%	35.0%	5.1%	38.0%	not collected	
2021 November	11.1%	52.0%	15.2%	80.0%	0.0%	8.0%	not collected	
2022 Summer	12.1%	17.0%	4.0%	13.0%	0.0%	11.0%	0.0%	19.0%
2022 Fall/Winter	0.0%	12.2%	5.1%	49.0%	1.0%	36.7%	not collected	

Table 5: Matrix Results from 2007 - 2022

Summary

In brief, we reported:

1. Overall, a low but consistent positivity rate was observed across all sites, except for Seymour reservoir, for both *Cryptosporidium* oocysts and *Giardia* cysts. Seymour reservoir is a new site this year and more data will be required for any trend analysis.
2. *Cryptosporidium* oocysts were not detected the following sites: Capilano reservoir, Coquitlam reservoir, SCFP-RCW and Seymour reservoir.
3. *Giardia* cysts were detected in filters from Capilano and Coquitlam reservoirs but not from SCFP-RCW or Seymour reservoir. 17% of all filters received from Capilano were positive for *Giardia*, and 8% of all filters received from Coquitlam were positive for *Giardia*, and there were no *Giardia* cysts detected for SCFP-RCW or Seymour reservoir.
4. The highest concentration of *Giardia* cysts detected in 2022 was 2 cysts per 100 L from Capilano reservoir in January and October, as well as from Coquitlam reservoir in January.
5. Most of the *Giardia* cysts detected showed evidence of environmental degradation, based on microscopic examination. .
6. Matrix recovery for *Cryptosporidium* oocyst continued to be low, which is consistent with previous years. The additional matrix collection in the summer did not confirm suspected seasonality variabilities for this year. Further summer matrix collections are recommended to continue this 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

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Appendix A

Lab #	Site Sampled	Month	Date Sampled	Volume filtered (L)	Detection Limit (per 100L)	Cryptosporidium oocysts (per 100L)	Giardia cysts (per 100L)	2015 - 2021 Monthly Average	
								Cryptosporidium oocysts (per 100L)	Giardia cysts (per 100L)
8224	Capilano Reservoir	January	January 17, 2022	50	<2.0	0	2	0.3	3.1
8229	Capilano Reservoir	February	February 14, 2023	50	<2.0	0	0	0.0	2.0
8234	Capilano Reservoir	March	March 21, 2022	50	<2.0	0	0	0.0	2.6
8239	Capilano Reservoir	April	April 11, 2022	50	<2.0	0	0	0.6	0.3
8249	Capilano Reservoir	May	May 16, 2022	50	<2.0	0	0	0.0	1.1
8254	Capilano Reservoir	June	June 20, 2022	50	<2.0	0	0	0.0	0.9
8262	Capilano Reservoir	July	July 18, 2022	50	<2.0	0	0	0.0	0.6
8270	Capilano Reservoir	August	August 22, 2022	50	<2.0	0	0	0.0	0.3
8278	Capilano Reservoir	September	September 26, 2022	30	<3.3	0	0	0.0	0.0
8293	Capilano Reservoir	October	October 31, 2022	50	<2.0	0	2	0.0	1.4
8300	Capilano Reservoir	November	November 21, 2022	50	<2.0	0	0	0.3	1.6
8307	Capilano Reservoir	December	December 12, 2022	50	<2.0	0	0	1.0	3.6
2022 Average				48.3	<2.0	0	0.3		

Table A1. Capilano Reservoir Monthly Filter Results in 2022

Lab #	Site Sampled	Month	Date Sampled	Volume filtered (L)	Detection Limit (per 100L)	Cryptosporidium oocysts (per 100L)	Giardia cysts (per 100L)	2015 - 2021 Monthly Average	
								Cryptosporidium oocysts (per 100L)	Giardia cysts (per 100L)
8225	Coquitlam Reservoir	January	January 17, 2022	50	<2.0	0	2	0.0	0.6
8230	Coquitlam Reservoir	February	February 14, 2024	50	<2.0	0	0	0.0	1.7
8235	Coquitlam Reservoir	March	March 21, 2022	50	<2.0	0	0	0.0	2.3
8240	Coquitlam Reservoir	April	April 11, 2022	50	<2.0	0	0	0.0	1.1
8250	Coquitlam Reservoir	May	May 16, 2022	50	<2.0	0	0	0.0	0.9
8255	Coquitlam Reservoir	June	June 20, 2022	50	<2.0	0	0	0.0	0.0
8263	Coquitlam Reservoir	July	July 18, 2022	50	<2.0	0	0	0.0	0.3
8271	Coquitlam Reservoir	August	August 22, 2022	50	<2.0	0	0	0.0	0.6
8279	Coquitlam Reservoir	September	September 26, 2022	45	<2.2	0	0	0.0	0.0
8294	Coquitlam Reservoir	October	October 31, 2022	50	<2.0	0	0	0.0	0.3
8301	Coquitlam Reservoir	November	November 21, 2022	50	<2.0	0	0	0.0	1.7
8308	Coquitlam Reservoir	December	December 12, 2022	50	<2.0	0	0	0.0	1.1
2022 Average				49.6	<2.0	0	0		

Table A2. Coquitlam Reservoir Monthly Filter Results in 2022

Lab #	Site Sampled	Month	Date Sampled	Volume filtered (L)	Detection Limit (per 100L)	Cryptosporidium oocysts (per 100L)	Giardia cysts (per 100L)	2015 - 2021 Monthly Average	
								Cryptosporidium oocysts (per 100L)	Giardia cysts (per 100L)
8226	SCFP - Recycled Clarified Water	January	January 18, 2022	898	0.111	0	0	0.0	0.0
8231	SCFP - Recycled Clarified Water	February	February 15, 2022	319.7	<0.31	0	0	0.0	0.0
8236	SCFP - Recycled Clarified Water	March	March 22, 2022	168.5	<0.59	0	0	0.0	0.0
8241	SCFP - Recycled Clarified Water	April	April 12, 2022	343.7	<0.29	0	0	0.0	0.0
8251	SCFP - Recycled Clarified Water	May	May 17, 2022	259.8	<0.38	0	0	0.0	0.0
8256	SCFP - Recycled Clarified Water	June	June 21, 2022	327.5	<0.31	0	0	0.0	0.0
8264	SCFP - Recycled Clarified Water	July	July 19, 2022	91.1	<1.1	0	0	0.0	0.0
8273	SCFP - Recycled Clarified Water	August	August 24, 2022	59	<1.7	0	0	0.0	0.0
8281	SCFP - Recycled Clarified Water	September	September 27, 2022	102.5	<0.97	0	0	0.0	0.0
8285	SCFP - Recycled Clarified Water	October	October 18, 2022	50	<1.53	0	0	0.0	0.0
8303	SCFP - Recycled Clarified Water	November	November 22, 2022	207.1	<0.48	0	0	0.0	0.1
8310	SCFP - Recycled Clarified Water	December	December 13, 2022	531.9	<0.19	0	0	0.0	0.9
2022 Average				279.9	0.66	0	0		

Table A3. Seymour Capilano Filtration Plant - Recycled Clarified Water (SCFP-RCW) Monthly Filter Results in 2022

Lab #	Site Sampled	Month	Date Sampled	Volume filtered (L)	Detection Limit (per 100L)	<i>Cryptosporidium</i> oocysts (per 100L)	<i>Giardia</i> cysts (per 100L)
n/a	Seymour Reservoir	January			not sampled		
n/a	Seymour Reservoir	February			not sampled		
n/a	Seymour Reservoir	March			not sampled		
n/a	Seymour Reservoir	April			not sampled		
n/a	Seymour Reservoir	May			not sampled		
n/a	Seymour Reservoir	June			not sampled		
8265	Seymour Reservoir	July	July 18, 2022	50	<2.0	0	0
8272	Seymour Reservoir	August	August 22, 2022	36	<2.0	0	0
8280	Seymour Reservoir	September	September 26, 2022	30	<3.3	0	0
n/a	Seymour Reservoir	October			not sampled		
8302	Seymour Reservoir	November	November 21, 2022	30	<3.33	0	0
8309	Seymour Reservoir	December	December 12, 2022	50	<2.0	0	0
			2022 Average	39.2	2.69	0	0

Table A4. Seymour Reservoir Monthly Filter Results in 2022

Lab #	Site name	Date sampled	<i>Cryptosporidium</i>								
			<i>Cryptosporidium</i>			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 oocysts	Oocysts with amorphous structure	Oocysts with internal structure, Number of sporozoites
8224	Capilano Reservoir	January 16, 2022	0								
8229	Capilano Reservoir	February 13, 2022	0								
8234	Capilano Reservoir	March 20, 2022	0								
8239	Capilano Reservoir	April 10, 2022	0								
8249	Capilano Reservoir	May 15, 2022	0								
8254	Capilano Reservoir	June 19, 2022	0								
8262	Capilano Reservoir	July 17, 2022	0								
8270	Capilano Reservoir	August 21, 2022	0								
8278	Capilano Reservoir	September 25, 2022	0								
8293	Capilano Reservoir	October 30, 2022	0								
8300	Capilano Reservoir	November 20, 2022	0								
8307	Capilano Reservoir	December 11, 2022	0								

Table A5. Capilano Reservoir Slide Examination Results - *Cryptosporidium* 2022

Lab #	Site name	Date sampled	<i>Cryptosporidium</i>								
			<i>Cryptosporidium</i>			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 oocysts	Oocysts with amorphous structure	Oocysts with internal structure, Number of sporozoites
8225	Coquitlam Reservoir	January 16, 2022	0								
8230	Coquitlam Reservoir	February 13, 2022	0								
8235	Coquitlam Reservoir	March 20, 2022	0								
8240	Coquitlam Reservoir	April 10, 2022	0								
8250	Coquitlam Reservoir	May 15, 2022	0								
8255	Coquitlam Reservoir	June 19, 2022	0								
8263	Coquitlam Reservoir	July 17, 2022	0								
8271	Coquitlam Reservoir	August 21, 2022	0								
8279	Coquitlam Reservoir	September 25, 2022	0								
8294	Coquitlam Reservoir	October 30, 2022	0								
8301	Coquitlam Reservoir	November 20, 2022	0								
8308	Coquitlam Reservoir	December 11, 2022	0								

Table A6. Coquitlam Reservoir Slide Examination Results - *Cryptosporidium* 2022

Lab #	Site name	Date sampled	<i>Cryptosporidium</i>								
			<i>Cryptosporidium</i>			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 oocysts	Oocysts with amorphous structure	Oocysts with internal structure, Number of sporozoites
8226	SCFP - Recycled Clarified Water	January 18, 2022	0								
8231	SCFP - Recycled Clarified Water	February 15, 2022	0								
8236	SCFP - Recycled Clarified Water	March 22, 2022	0								
8241	SCFP - Recycled Clarified Water	April 12, 2022	0								
8251	SCFP - Recycled Clarified Water	May 17, 2022	0								
8256	SCFP - Recycled Clarified Water	June 21, 2022	0								
8264	SCFP - Recycled Clarified Water	July 19, 2022	0								
8273	SCFP - Recycled Clarified Water	August 24, 2022	0								
8281	SCFP - Recycled Clarified Water	September 26, 2022	0								
8285	SCFP - Recycled Clarified Water	October 18, 2022	0								
8303	SCFP - Recycled Clarified Water	November 22, 2022	0								
8310	SCFP - Recycled Clarified Water	December 13, 2022	0								

Table A7. Seymour Capilano Filtration Plant – Recycled Clarified Water Slide Examination Results - *Cryptosporidium* 2022

Lab #	Site name	Date sampled	Cryptosporidium									
			Cryptosporidium			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 oocysts	Oocysts with amorphous structure	Oocysts with internal structure, Number of sporozoites
8265	Seymour Reservoir	July 17, 2022	0									
8272	Seymour Reservoir	August 21, 2022	0									
8280	Seymour Reservoir	September 25, 2022	0									
8302	Seymour Reservoir	November 20, 2022	0									
8309	Seymour Reservoir	December 11, 2022	0									

Table A8. Seymour Reservoir Slide Examination Results - *Cryptosporidium* 2022

Lab #	Site name	Date sampled	Giardia											
			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	Axoneme
▼		▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
8224	Capilano Reservoir	January 16, 2022	#1	Oval	14x10	P					P			
8229	Capilano Reservoir	February 13, 2022	0											
8234	Capilano Reservoir	March 20, 2022	0											
8239	Capilano Reservoir	April 10, 2022	0											
8249	Capilano Reservoir	May 15, 2022	0											
8254	Capilano Reservoir	June 19, 2022	0											
8262	Capilano Reservoir	July 17, 2022	0											
8270	Capilano Reservoir	August 21, 2022	0											
8278	Capilano Reservoir	September 25, 2022	0											
8293	Capilano Reservoir	October 30, 2022	#1	oval	14x7			P			P			
8300	Capilano Reservoir	November 20, 2022	0											
8307	Capilano Reservoir	December 11, 2022	0											

Table A9. Capilano Reservoir Slide Examination Results - *Giardia* 2022 (P = present)

Lab #	Site name	Date sampled	Giardia											
			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	Axoneme	
▼		▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	
8225	Coquitlam Reservoir	January 16, 2022	#1	Oval	11x8			3			1			
8230	Coquitlam Reservoir	February 13, 2022	0											
8235	Coquitlam Reservoir	March 20, 2022	0											
8240	Coquitlam Reservoir	April 10, 2022	0											
8250	Coquitlam Reservoir	May 15, 2022	0											
8255	Coquitlam Reservoir	June 19, 2022	0											
8263	Coquitlam Reservoir	July 17, 2022	0											
8271	Coquitlam Reservoir	August 21, 2022	0											
8279	Coquitlam Reservoir	September 25, 2022	0											
8294	Coquitlam Reservoir	October 30, 2022	0											
8301	Coquitlam Reservoir	November 20, 2022	0											
8308	Coquitlam Reservoir	December 11, 2022	0											

Table A10. Coquitlam Reservoir Slide Examination Results - *Giardia* 2022 (P = present)

			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	Axoneme	
▼		▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
8226	SCFP - Recycled Clarified Water	January 18, 2022	0											
8231	SCFP - Recycled Clarified Water	February 15, 2022	0											
8236	SCFP - Recycled Clarified Water	March 22, 2022	0											
8241	SCFP - Recycled Clarified Water	April 12, 2022	0											
8251	SCFP - Recycled Clarified Water	May 17, 2022	0											
8256	SCFP - Recycled Clarified Water	June 21, 2022	0											
8264	SCFP - Recycled Clarified Water	July 19, 2022	0											
8273	SCFP - Recycled Clarified Water	August 24, 2022	0											
8281	SCFP - Recycled Clarified Water	September 26, 2022	0											
8285	SCFP - Recycled Clarified Water	October 18, 2022	0											
8303	SCFP - Recycled Clarified Water	November 22, 2022	0											
8310	SCFP - Recycled Clarified Water	December 13, 2022	0											

Table A11. Seymour Capilano Filtration Plant – Recycled Clarified Water Slide Examination Results - *Giardia* 2022

Lab #	Site name	Date sampled	Giardia													
			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	Axoneme			
8265	Seymour Reservoir	July 17, 2022	0													
8272	Seymour Reservoir	August 21, 2022	0													
8280	Seymour Reservoir	September 25, 2022	0													
8302	Seymour Reservoir	November 20, 2022	0													
8309	Seymour Reservoir	December 11, 2022	0													

Table A12. Seymour Reservoir Slide Examination Results - *Giardia* 2022

To: GVWD Board of Directors

From: Finance Committee

Date: April 13, 2023

Meeting Date: April 28, 2023

Subject: **Audited 2022 Financial Statements and Annual Financial Results**

FINANCE COMMITTEE RECOMMENDATION

That the GVWD Board approve the Audited 2022 Consolidated Financial Statements for the Metro Vancouver Regional District.

At its April 13, 2023 meeting, the Finance Committee considered the attached report titled “Audited 2022 Financial Statements and Annual Financial Results” dated April 5, 2023.

Staff advised the Committee that on April 12, 2023 the MVHC entered into a three-year memorandum of understanding with the Province of British Columbia, through the BCHMC, to provide \$158 million in funding to the MVHC over the next three years for the construction of approximately 660 new homes at five of the MVHC sites. Canadian Accounting Standards requires that significant events occurring after an organization’s fiscal year end be disclosed in the notes to the financial statements. As such, “Metro Vancouver Districts and Metro Vancouver Housing Corporation Financial Statements” has been amended to include this information in the financial statement notes.

The report with the updated Financial Statements is attached to this report and this matter is now before the Board for its consideration.

Attachment

“Audited 2022 Financial Statements and Annual Financial Results”, dated April 5, 2023

59281870

To: Finance Committee

From: Linda Sabatini, Director, Financial Operations

Date: April 5, 2023

Meeting Date: April 13, 2023

Subject: **Audited 2022 Financial Statements and Annual Financial Results**

RECOMMENDATION

That the MVRD Board approve the Audited 2022 Consolidated Financial Statements for the Metro Vancouver Regional District.

That the GVS&DD Board approve the Audited 2022 Financial Statements for the Greater Vancouver Sewerage and Drainage District.

That the GVWD Board approve the Audited 2022 Financial Statements for the Greater Vancouver Water District.

That the MVHC Board approve the Audited 2022 Financial Statements for the Metro Vancouver Housing Corporation.

EXECUTIVE SUMMARY

The attached 2022 financial results illustrate that, despite global economic uncertainty, Metro Vancouver continues to maintain a strong financial position, with excellent liquidity and solid reserves. This is critical to ensure ongoing capacity to continue to finance infrastructure investments and provide ongoing Metro Vancouver services. The annual surplus to budget, as detailed in Appendix 2, was \$36.6 million, largely a result of staffing vacancies and project delays resulting in lower than expected operational costs and debt servicing costs.

The attached 2022 financial statements have been prepared in accordance with Canadian Public Sector Accounting Standards ("PSAS") and have received an unqualified audit opinion by the external auditors, BDO Canada LLP Chartered Professional Accountants. These statements have been prepared using a new financial statement compilation tool, which will assist the Finance team in improving and streamlining the financial statement package. The financial statements presented are currently draft and will be finalized upon approval by the Board on April 28, 2023.

PURPOSE

To present, for approval, the Audited 2022 Financial Statements for the Metro Vancouver Districts and the Metro Vancouver Housing Corporation and provide for information the 2022 financial results and surplus to budget.

BACKGROUND

Legislation requires that annual audited financial statements be prepared for the Metro Vancouver Districts and Metro Vancouver Housing Corporation and presented at a public meeting of the Board of Directors and approved and submitted to the Province by May 15th each year. The Audited Financial Statements for 2022 have been prepared by management in accordance with Canadian Public Sector Accounting Standards ("PSAS") and have received an unqualified audit opinion by the external auditors, BDO Canada LLP Chartered Professional Accountants. These statements have been prepared using a new financial statement compilation tool, which will assist the Finance team in improving and streamlining the financial statement package. The statements presented are currently draft and will be finalized upon approval by the Board on April 28, 2023.

In addition, the annual financial results and surplus to budget are required to be presented to the Finance Committee. Included in Appendix 2 are the highlights of the financial results for the full fiscal year of 2022.

2022 FINANCIAL STATEMENTS AND RESULTS

The complete set of 2022 Audited Financial Statements is included in Attachment 1, with Financial Statement Highlights presented in *Appendix 1*. These statements are presented for the Boards' approval and include:

- Audited 2022 Consolidated Financial Statements for the Metro Vancouver Regional District
- Audited 2022 Financial Statements for the Greater Vancouver Sewerage and Drainage District
- Audited 2022 Financial Statements for the Greater Vancouver Water District
- Audited 2022 Financial Statements for the Metro Vancouver Housing Corporation

The consolidated financial statements combine the accounts of the Metro Vancouver Regional District, Greater Vancouver Sewerage and Drainage District, Greater Vancouver Water District and the Metro Vancouver Housing Corporation.

Two key statements included in the audited package, the *Consolidated Statement of Financial Position (Exhibit A)* and the *Consolidated Statement of Operations (Exhibit B)*, similar to the Balance Sheet and Income Statement in private organizations, are the foundation of the audited statements. Highlights of the key indicators in the audited financial statements are provided below with a more detailed analysis in *Appendix 1*. In addition, the 2022 Financial Operating Results, presented based on Metro Vancouver's annual budget are provided in *Appendix 2*.

It is important to note that there are differences between the presentation in these financial statements and the annual Metro Vancouver budget, which is prepared, in accordance with enabling legislation, to determine the annual revenue requirements to meet expenditure obligations. These differences are outlined below and included in *Appendix 1*.

Statement of Financial Position

The *Consolidated Statement of Financial Position (Exhibit A)* included in the audited financial statements provides key information to evaluate the government's ability to finance its ongoing activities to meet its liabilities and contractual obligations, as well as provide future services.

For discussion, a *Condensed Statement of Financial Position*, presented net of Translink and member municipalities' debt, is included in *Appendix 1*, along with five-year trends on the four key financial indicators in this statement (financial assets, net debt, non-financial assets and accumulated surplus).

Financial Assets

Although cash and investment resources for 2022 are lower than 2021 by \$248.5 million, Metro Vancouver has a strong liquidity position, with financial assets 2.7 times more than current liabilities. This indicates that the financial assets are more than sufficient to offset the amount of short-term obligations. The five-year cash trend in Appendix 1 shows cash balances are relatively stable, with slight fluctuations due to the timing grant funding received and the subsequent application to fund capital spending.

Net Debt

The net debt position indicates the amount by which the organizations' liabilities exceed the financial assets. Although the 2022 net debt increase of \$249.6 million appears as unfavorable, the vast majority (over 73%) of the organization's liabilities is long-term debt which is repayable over several years. As indicated above, the organization's financial assets are more than sufficient to offset the amount of short-term obligations. In addition, the debt servicing ratio, which indicates how much of the organization's revenues is utilized by debt payments is 19.6%, indicating there are sufficient revenues to meet annual long-term obligations.

Non-financial Assets

Non-financial assets increased by \$627.5 million in 2022, a direct result of the capital investments made in the year. Appendix 2 provides a summary by entity of the capital expenditures for 2022. Although non-financial assets have grown 52.9% in 5 years, from \$5.1 billion in 2018 to over \$7.8 billion in 2022, total liabilities, which includes long term debt, has only increased by 29.1% over the same time period. This indicates that more of the District's assets are pay-as-you go funded.

Accumulated Surplus

The 2022 accumulated surplus of \$6.3 billion reflects the member municipalities' net investment in the District's consolidated entity, which comprises of reserve balances of \$441.0 million and investment in tangible capital assets and capital funds of \$5.8 billion.

The accumulated surplus increased by \$378.0 million in 2022, which represents the annual accounting surplus for the year, calculated as the difference between revenues and expenses

on a PSAS basis. The chart below, shows the difference between the annual surplus for PSAS versus the annual operating surplus of \$36.6 million for budget purposes.

Operating Results

The *Consolidated Statement of Operations* (Exhibit B in the audited consolidated financial statements) provides key information about the organization's financial activities, revenues, expenses, and annual surplus.

Annual Surplus

The annual surplus for PSAS purposes, calculated as the difference between revenues and expenses of \$378.0 million serves as the 2022 addition to the organization's overall accumulated surplus position or net worth of \$5.9 billion. The vast majority of the surplus is attributable to lower than anticipated salary expenses due to vacancies and lower expenditures due to project delays. *Appendix 1* provides details on the financial statement revenues and expenses by category.

As noted previously, the annual surplus as presented under PSAS is different from the annual surplus as determined in the context of the annual operating budget, which is \$36.6 million. For PSAS purposes, annual surplus does not include contributions to and from reserves, capital contributions or principal payments on long-term debt. A reconciliation of the PSAS surplus to the budgeted surplus is provided below. For details regarding the 2022 Operating Results by legal entity, refer to *Appendix 2*.

Consolidated Statement of Operations and Reconciliation to Budget
For the year ended December 31, 2022
(in thousands of dollars)

	Budget	2022	2021
Revenue	\$ 1,222,134	\$ 1,114,319	\$ 1,080,455
Expenses	(770,430)	(736,363)	(645,397)
Annual Surplus per PSAS	451,704	377,956	435,058
Applications and transfers included in operating budget			
Contributions to capital	203,053	200,721	211,063
Payments on long-term debt	140,561	140,226	109,169
Transfers to (from) reserves	1,671	18,026	23,142
PSAS items excluded from annual operating budget			
Amortization of tangible capital assets	(96,267)	(99,337)	(86,610)
Sinking fund and debt retirement income	25,566	27,936	25,748
Capital grants, DCC and other capital revenue	170,530	37,655	80,448
Reserve fund interest	6,590	10,561	4,323
Corporate program surplus (transfer to reserves)	-	5,578	11,231
	451,704	341,366	378,514
Annual Surplus based on budget	\$ -	\$ 36,590	\$ 56,544

ALTERNATIVES

The audited financial statements are a statutory requirement prepared in accordance to specific accounting principles. No alternatives are presented.

FINANCIAL IMPLICATIONS

There are no financial implications relative to the approval of the Audited 2022 Financial Statements.

CONCLUSION

The financial statements are part of the legislated reporting requirements for 2022 and staff recommends their approval. As noted in the Auditor's Report, it is the Auditor's opinion that these Financial Statements present fairly the financial position of the Metro Vancouver Districts and the Metro Vancouver Housing Corporation as of December 31, 2022, and the results of their financial activities and changes in their financial position for the year then ended in accordance with Canadian Public Sector Accounting Standards.

Attachments

- Appendix 1 2022 Financial Statement Highlights
- Appendix 2 2022 Financial Results and Surplus to Budget
- Attachment 1 Metro Vancouver Districts and Metro Vancouver Housing Corporation Financial Statements for the year ended December 31, 2022

2022 Financial Statement Highlights

The consolidated financial statements combine the accounts of the four Metro Vancouver legal entities (MVRD, GVS&DD, GVWD and MVHC). The statements have been prepared by management in accordance with Canadian public sector accounting standards and have received an unqualified audit opinion by the external auditors.

Under PSAS regulations, governments are required to present four financial statements with explanatory notes: Statement of Financial Position (Exhibit A), Statement of Operations (Exhibit B), Statement of Net Debt (Exhibit C) and Statement of Cash Flows (Exhibit D). It is important to note that there are differences between the presentation in these financial statements and the annual Metro Vancouver budget, which is prepared, in accordance with enabling legislation, to determine the annual revenue requirements to meet expenditure obligations. These differences are shown in Table 3 below.

Two key statements, the *Consolidated Statement of Financial Position* and the *Consolidated Statement of Operations*, similar to the Balance Sheet and Income Statement in private organizations, are the foundation of the audited statements. They contain five key indicators, financial assets, financial liabilities, net debt position, non-financial assets, accumulated surplus and annual surplus. These indicators form the basis of the analysis below.

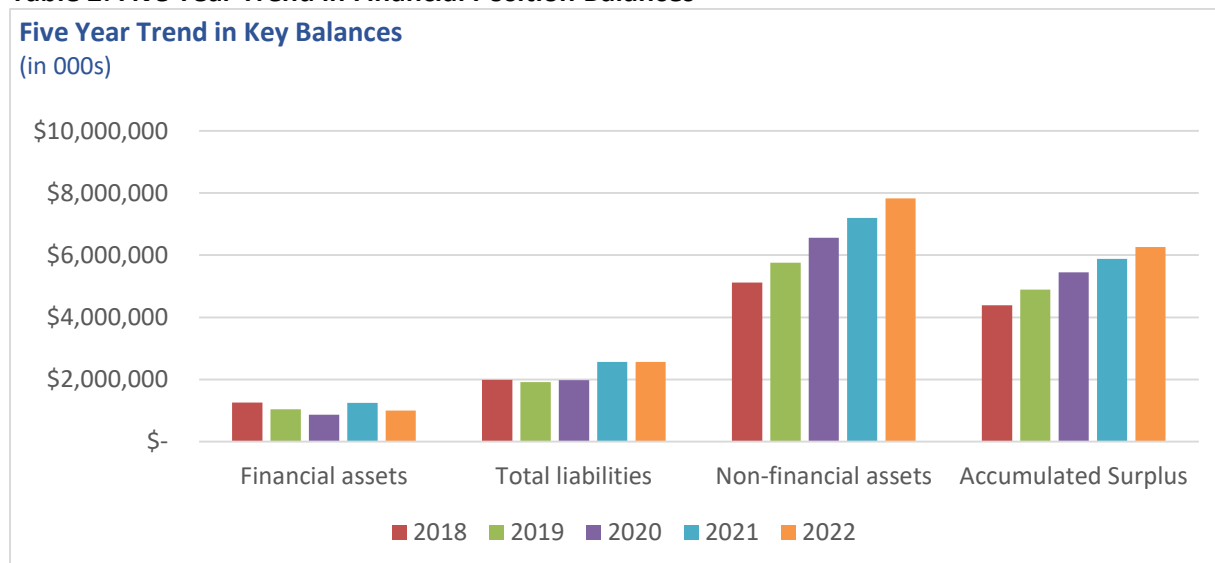
Financial Position

Maintaining a solid financial position is critical to ensure there is ongoing capacity to continue to finance infrastructure investments and provide ongoing programs for all Metro Vancouver services. The *Consolidated Statement of Financial Position (Exhibit A)* of the audited consolidated statements provides key information to evaluate the government's ability to finance its ongoing activities to meet its liabilities and contractual obligations, as well as provide future services. For discussion purposes, a *Condensed Consolidated Statement of Financial Position*, and five-year trend on key financial position indicators is presented in *Table 1* and *Table 2* below, net of Translink and member municipalities' debt. The debt owing to the Municipal Finance Authority for TransLink and member municipalities is completely offset by a receivable from these entities, reflecting the fact that these entities are responsible for their debt. Therefore, the impact on Metro Vancouver's financial position is nil and has been excluded from the condensed financial position statement below.

Table 1: Condensed Consolidated Statement of Financial Position

Condensed Consolidated Statement of Financial Position					
As of December 31, 2022					
(in thousands of dollars)					
	2022		2021		Change
Cash, cash equivalents and investments	\$	779,429	\$	1,027,885	\$ (248,456)
Other financial assets		223,964		222,261	1,703
Total Financial Assets		1,003,393		1,250,146	(246,753)
Liabilities		670,530		701,908	(31,378)
Debt, net of Translink and members		1,898,013		1,863,798	34,215
Total Liabilities		2,568,543		2,565,706	2,837
Net Debt		(1,565,150)		(1,315,560)	(249,590)
Non-Financial Assets		7,824,748		7,197,202	627,546
Accumulated Surplus	\$	6,259,598	\$	5,881,642	\$ 377,956
Accumulated Surplus (Equity) consists of					
Reserves		441,040		394,831	46,209
Non-financial assets, net of debt and capital funds		5,818,558		5,486,811	331,747
	\$	6,259,598	\$	5,881,642	\$ 377,956

Table 2: Five Year Trend in Financial Position Balances



Financial Assets

Metro Vancouver's financial assets include cash, cash equivalents, investments, accounts receivables and MFA debt reserve fund. The financial assets have been relatively stable over the past five years with a slight downward trend as cash received from deferred grants and reserves were applied to capital infrastructure projects.

Cash, Cash Equivalents and Investments

Cash, cash equivalents and investments consist of cash and both long and short-term investments. The 2022 balance was lower than 2021 largely from the timing of debt financing for capital infrastructure projects and the use of deferred grants and reserves previously held in cash.

Other Financial Assets

Other financial assets include accounts receivable (\$193.7 million) and the debt reserve fund (\$30.3 million). Other financial assets were \$1.7 million higher than 2021 mainly due to:

- Slightly higher accounts receivable of \$622 thousand from the timing of billings and collections. Accounts receivable are amounts due through the normal course of District business. The balance at December 31, 2022 comprises mainly of tipping fees due from commercial solid waste haulers, development cost charge (DCC) income, industrial sewer charges from commercial customers and payments due from our member municipalities for water sales.
- Increase in the debt reserve fund balance of \$1.1 million due to new debenture debt issued in the year. The debt reserve fund represents the amount required, under agreement with the Municipal Finance Authority (MFA), as security for debt service obligations. This balance fluctuates upward with new debt issues and downward as issues mature.

Total Liabilities

Total liabilities include trade accounts payables and accrued liabilities, employee future benefits liability, landfill closure and post-closure liability, deferred revenue and long-term debt. The five-year trend shows that liabilities have increased by \$579 million, largely a result of higher debt related to capital infrastructure projects.

Liabilities

Liabilities in 2022 were lower than 2021 by \$31.4 million, mainly due to:

- Lower accounts payable and accrued liabilities of \$51.8 million, mainly due to less trade payables and construction holdbacks due to the timing of payments offset by

increase in payroll accruals for anticipated wage increases related to collective bargaining.

- Increase in landfill liability of \$8.1 million due to higher inflation and therefore higher anticipated closure costs.
- Slight increase of \$0.7 million in employee future benefit costs due to higher inflation expected inflation.
- Higher deferred revenue and refundable deposits of \$2.0 million largely from the reduced application of development cost charges (DCCs) and grant funding in 2022 caused by capital project delays

Long-term Debt

Long-term debt, net of sinking funds reflects the amount of long term borrowing outstanding at the end of 2022. Sinking funds consist of principal payments made over the term of the debt issue. These payments are invested which along with the interest earned will offset the debt repayment at maturity.

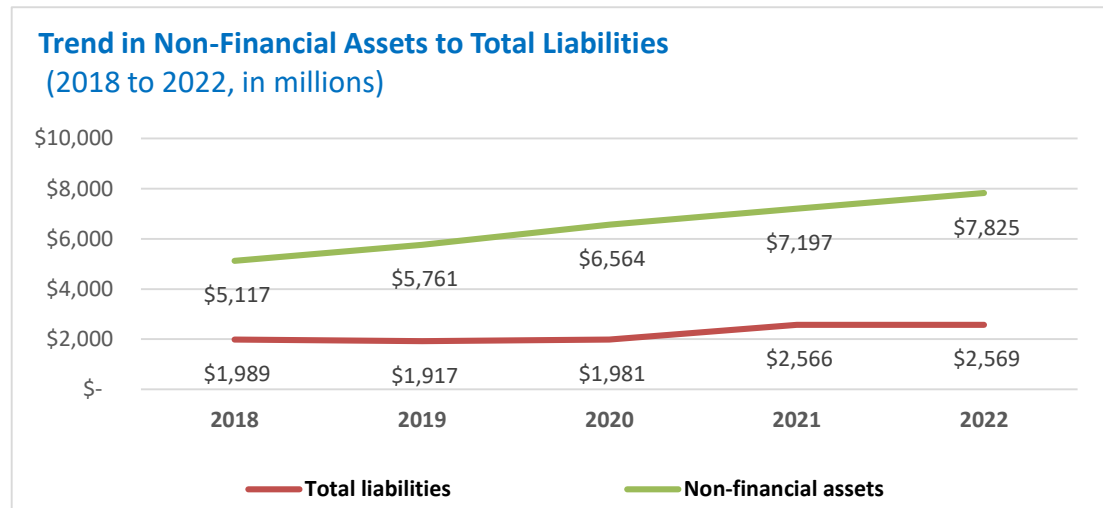
The debt for Metro Vancouver increased by \$34.2 million. New long-term borrowing during the year was \$200.0 million (\$160.0 million for GVS&DD and \$40.0 million for GVWD). This increase is offset by debt and sinking fund payments and interest of \$165.8 million.

Net Debt

The net debt position indicates the amount by which the organizations' liabilities exceed the financial assets. The net debt position increased by \$249.6 million. Although the amount appears as unfavorable, the vast majority (over 73%) of the organization's liabilities is long-term debt which is repayable over several years. In addition, the organization's financial assets are more than sufficient to offset the amount of short-term obligations. The current ratio which is current assets divided by current liabilities and is a measure of an organization's liquidity is 2.7 to 1.

Non- Financial Assets

Non-financial assets increased by \$627.5 million in 2022, a direct result of the capital expenditures made in the year, the majority of which were for water and liquid waste infrastructure projects. The chart below shows that non-financial assets have grown 52.9% in 5 years, from \$5.1 billion in 2018 to over \$7.8 billion in 2022. However, total liabilities, which includes long term debt, has only increased 29.1%, from \$1.99 billion in 2018 to \$2.6 billion in 2022. This indicates that more of the District's assets are pay-as-you go funded.

Table 4: Trend in Non-Financial Assets to Total Liabilities

Accumulated Surplus

The 2022 accumulated surplus of \$6.3 billion reflects the member municipalities' net investment in the District's consolidated entity, which comprises of reserve balances of \$441.0 million and investment in tangible capital assets and capital funds of \$5.8 billion. It is important to note that the investment in capital assets is based on historical cost and does not represent the replacement value of the assets in service for Metro Vancouver.

The accumulated surplus increased by \$378.0 million in 2022, which represents the annual surplus for the year, calculated as the difference between revenues and expenses. Table 5 below show the difference between the annual surplus for PSAS (\$378.0 million) versus the annual surplus of \$36.6 million for budget purposes. Refer to Appendix 2 for a detailed explanation on the annual operating surplus based on budget preparation.

Financial Position Indicators

Illustrated below is the five-year trend to provide additional insight into Metro Vancouver's financial position. These ratios show that despite the global economic uncertainty over the past few years and current inflationary pressure, Metro Vancouver continues to maintain a healthy financial position.

Table 4: Financial Indicators – Five-year Trend

Ratio	Explanation	2018	2019	2020	2021	2022
Current Ratio	A measure of the organization's ability to pay its current liabilities from its current assets.	5.3 to 1	3.3 to 1	2.8 to 1	3.2 to 1	2.7 to 1
Operating Reserves /Total Revenue	A measure of the organization's ability to adjust to unplanned events and changing circumstances.	10.3%	7.2%	9.5%	11.6%	14.5%
Debt Servicing Ratio	Percentage of the organization's income that is utilized to service debt payments (comprising of principal and interest).	17.0%	12.9%	13.8%	17.1%	19.6%
Interest Ratio	Percentage of the organization's income that is utilized for interest payments.	6.5%	4.6%	4.7%	6.0%	6.4%
MVRD Property Tax and Liquid Waste Services Levies / Total Revenue	Percentage of the organization's revenue that is comprised of property tax and levies.	37.0%	29.1%	31.5%	36.4%	37.5%

Financial Statement Operating Results

The *Consolidated Statement of Operations* (Exhibit B of the audited consolidated financial statements) provides key information about the organization's financial activities, revenues, expenses and annual surplus.

Annual Surplus

The annual surplus, calculated as the difference between revenues and expenses of \$378.0 million serves as the 2022 addition to the organization's overall accumulated surplus position or net worth of 6.3 billion.

As noted previously, the annual surplus as presented under PSAS of \$378.0 million is different from the annual surplus as determined in the context of the annual budget, which is \$36.6 million. For PSAS purposes, annual surplus does not include contributions to and from reserves, capital contributions or principal payments on long-term debt. PSAS also consolidates revenues and expenses in capital and reserve funds, including items not part of the annual operating funding requirements, such as reserve interest, capital grants and amortization of tangible assets. A reconciliation of the PSAS surplus to the budgeted surplus is provided below in Table 5.

Table 5: PSAS Annual Surplus Reconciled to Budget Surplus

Consolidated Statement of Operations and Reconciliation to Budget				
For the year ended December 31, 2022				
(in thousands of dollars)				
	Budget	2022	2021	
Revenue	\$ 1,222,134	\$ 1,114,319	\$ 1,080,455	
Expenses	(770,430)	(736,363)	(645,397)	
Annual Surplus per PSAS	451,704	377,956	435,058	
Applications and transfers included in operating budget				
Contributions to capital	203,053	200,721	211,063	
Payments on long-term debt	140,561	140,226	109,169	
Transfers to (from) reserves	1,671	18,026	23,142	
PSAS items excluded from annual operating budget				
Amortization of tangible capital assets	(96,267)	(99,337)	(86,610)	
Sinking fund and debt retirement income	25,566	27,936	25,748	
Capital grants, DCC and other capital revenue	170,530	37,655	80,448	
Reserve fund interest	6,590	10,561	4,323	
Corporate program surplus (transfer to reserves)	-	5,578	11,231	
	451,704	341,366	378,514	
Annual Surplus based on budget	\$ -	\$ 36,590	\$ 56,544	

The following is a breakdown of the surplus per entity based on budget funding requirements. Discussion regarding the 2022 financial results by entity based on budget presentation, refer to Appendix 2.

Annual Surplus per Legal Entity
For the year ended December 31, 2022
(in thousands of dollars)

	2022	2021
Water District	\$ 7,954	\$ 8,425
Sewerage & Drainage District		
Liquid Waste Services	14,021	10,677
Solid Waste Services	(2,343)	17,360
Metro Vancouver Housing Corporation	10,309	15,291
Regional Programs	6,649	4,791
Annual Surplus	\$ 36,590	\$ 56,544

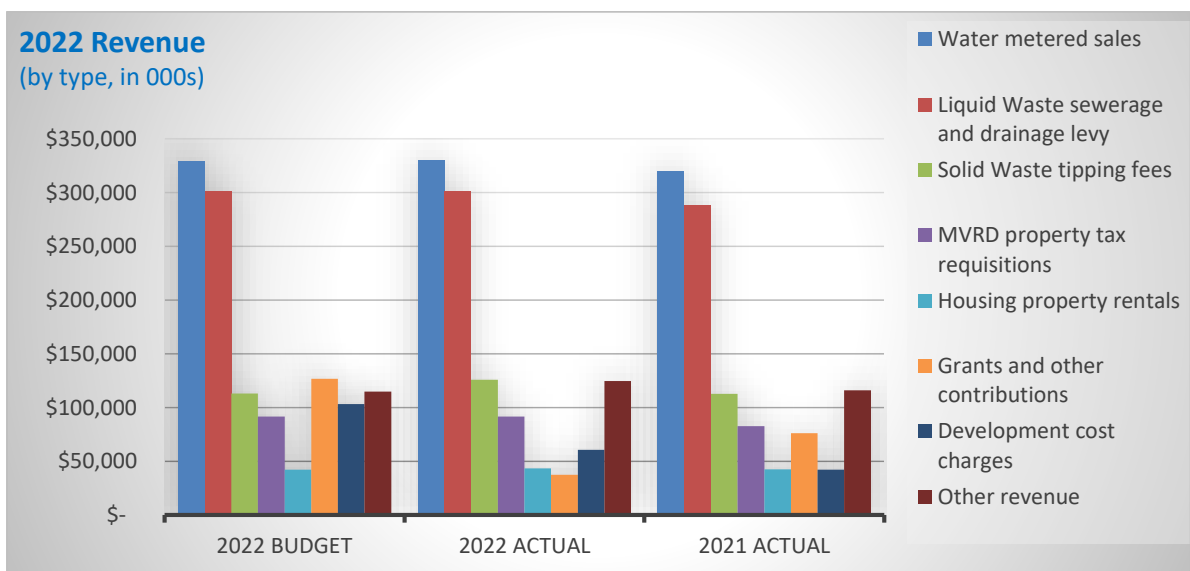
Total Financial Statement Revenue

Revenue for 2022, was \$1.11 billion, lower than budget of \$1.22 billion, mainly due to:

- Delays in capital spending resulting in \$89.5 million less grant funding and \$42.5 million less direct application of DCCs to fund capital spending.
- This decrease is offset by increases of
 - \$12.8 million in Solid Waste tipping fees due to higher construction demolition material processing, which historically haven't been delivered to the regional solid waste system, and,
 - \$9.9 million in other revenues, which includes \$4.5 million more sinking fund and interest income from higher than expected interest rates and \$5.8 million more unanticipated cost sharing recoveries related to capital projects.

The table and graph below show that tax levy revenue and metered sales of water are in line with budget and prior year.

Revenue By Category (in 000s)	2022 Budget	2022 Actual	2021 Actual
Water metered sales	\$ 329,366	\$ 329,678	\$ 319,989
Liquid Waste sewerage and drainage levy	301,425	301,425	288,226
Solid Waste tipping fees	112,910	125,797	112,610
MVRD property tax requisitions	91,708	91,708	82,714
Housing property rentals	42,051	43,267	42,416
Grants and other contributions	126,822	37,265	76,174
Development cost charges	103,080	60,583	42,204
Other revenue	114,713	124,596	116,122
Total	\$ 1,222,075	\$ 1,114,319	\$ 1,080,455



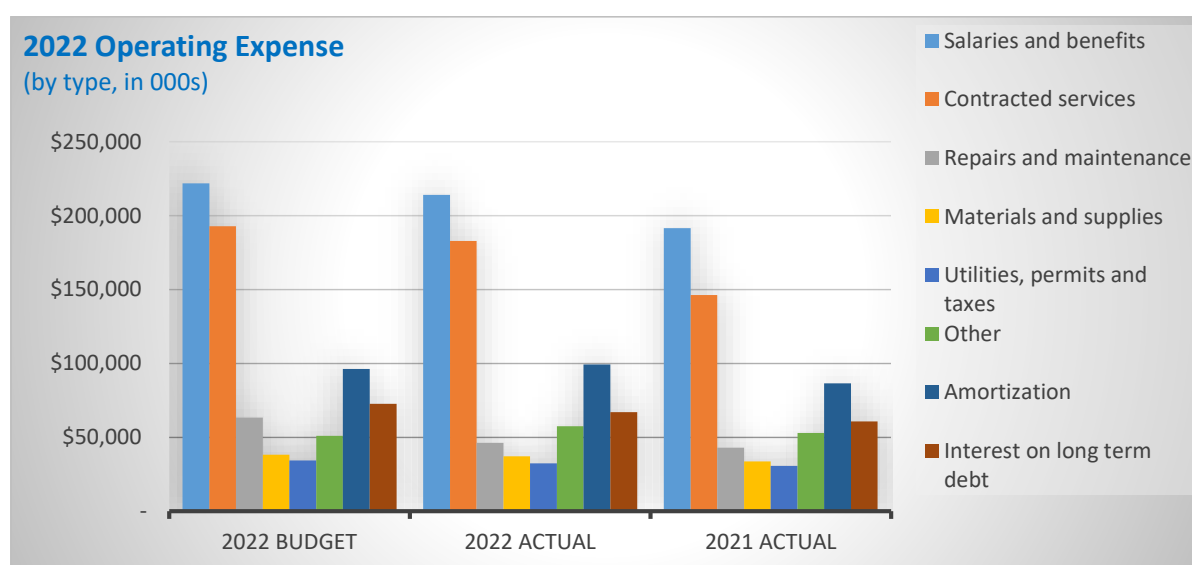
Total Financial Statement Expenses

Total expenses for 2022 were \$736.4 million, \$33.9 million lower than budget mainly from:

- staff vacancies resulting in \$7.7 million lower costs for salaries
- project delays resulting in lower than anticipated costs for contracted services, repairs, materials and permits of \$30.7 million
- capital project delays resulting in lower debt servicing costs of \$5.7 million.
- savings were offset by higher landfill closure costs of \$6.7 million and amortization of assets of \$3.0 million.

Expenses were \$91.0 million higher than prior year mainly due to overall inflationary and approved spending increases in the annual budget.

Operating Expenses by Category (in 000s)	2022 Budget	2022 Actual	2021 Actual
Salaries and benefits	\$ 221,673	\$ 213,969	\$ 191,444
Contracted services	192,812	182,918	146,256
Repairs and maintenance	63,390	46,157	43,061
Materials and supplies	38,139	37,236	33,732
Utilities, permits and taxes	34,381	32,341	30,552
Other	51,016	57,464	53,049
Amortization	96,267	99,336	86,610
Interest on long term debt	72,637	66,942	60,693
Total	\$ 770,315	\$ 736,363	\$ 645,397



2022 Financial Operating Results (Budget Presentation)

As noted previously, and presented in Appendix 1, the annual surplus in the financial statements as presented under PSAS of \$378.0 million is different from the annual operating surplus as determined in the context of the annual budget, which is \$36.6 million.

The following is the presentation of the 2022 annual operating results based on the budget presentation, including contributions to capital, reserve transfers and principal payments on long-term debt, but excluding PSAS non-operational items, such as amortization, capital grants, sinking fund revenue and reserve interest.

Metro Vancouver Districts Operating Budget Summary Year Ended December 31, 2022				
	Budget	Actual	% Actuals to Budget	Variance
REVENUES				
Key Service Revenues				
Water Sales	\$ 329,365,517	\$ 329,678,422	100%	\$ 312,905
Liquid Waste Services Levy	301,424,687	301,424,687	100%	-
Solid Waste Tipping Fees	112,909,870	125,797,097	111%	12,887,227
Metro Vancouver Regional District Requisitions	89,868,576	89,868,576	100%	-
Housing Rents	42,110,363	43,319,895	103%	1,209,532
	<u>875,679,013</u>	<u>890,088,677</u>	<u>102%</u>	<u>14,409,664</u>
Key Service Supplemental Revenues	<u>4,012,307</u>	<u>3,661,882</u>	<u>91%</u>	<u>(350,425)</u>
Variable Service Revenues	<u>38,217,925</u>	<u>50,578,761</u>	<u>132%</u>	<u>12,360,836</u>
Internal Transfers	<u>108,256,909</u>	<u>83,555,605</u>	<u>77%</u>	<u>(24,701,304)</u>
TOTAL REVENUES	<u>\$ 1,026,166,154</u>	<u>\$ 1,027,884,925</u>	<u>100%</u>	<u>\$ 1,718,771</u>
EXPENDITURES				
Greater Vancouver Water District	\$ 338,434,643	\$ 326,895,213	97%	\$ 11,539,430
Greater Vancouver Sewerage and Drainage District				
Liquid Waste Services	392,967,276	377,694,968	96%	15,272,308
Solid Waste Services	122,991,007	140,994,616	115%	(18,003,609)
Metro Vancouver Housing Corporation	54,798,873	41,299,758	75%	13,499,115
Metro Vancouver Regional District	<u>116,974,355</u>	<u>104,410,054</u>	<u>89%</u>	<u>12,564,301</u>
TOTAL EXPENDITURES	<u>\$ 1,026,166,154</u>	<u>\$ 991,294,609</u>	<u>97%</u>	<u>\$ 34,871,545</u>
SURPLUS (DEFICIT)	<u>\$ -</u>	<u>\$ 36,590,316</u>		<u>\$ 36,590,316</u>

Metro Vancouver
Surplus to Budget by Entity
Year ended December 31, 2022

	Budget	Actual	Variance	Commentary
Greater Vancouver Water District				
Revenues	338,434,643	334,849,556	(3,585,087)	Overall Water District had a surplus to budget of \$8.0M. Water sales were close to budget with a slight surplus of \$0.3M. The cooler spring resulted lower than expected sales earlier in the year but improved over the later part of the year, to conclude with water consumption levels only slightly less than planned. Other various revenues exceeded budget by \$2.8M offset by less reserve use than planned due to delayed projects and related underspends (\$6.6M) resulting in a (net) revenue shortfall of (\$3.5M). Staff vacancies, lower operations and maintenance costs than planned, lower than budgeted spending related to deferred operating projects, and lower than budget debt servicing costs have resulted in a surplus for expenditures of close to \$11.5M. The underspends, mainly due to work delays, consist primarily of water supply operations (\$2.2M) minor capital (\$1.6M), debt servicing costs(\$1.1M), project delivery department allocation (\$1.5M), SIF projects (\$3.1M) and other underspends for labour and other consulting work (\$2.0M).
Expenditures	338,434,643	326,895,213	11,539,430	
Surplus (Deficit)	-	7,954,343	7,954,343	
Greater Vancouver Sewerage and Drainage District				
Liquid Waste Services				
Revenues	392,967,276	391,716,144	(1,251,132)	Liquid Waste had a surplus to budget of \$14M. Staff vacancies, lower than budgeted spending related to deferred operating projects, operating and maintenance expenditures, debt servicing costs and residuals project work have all contributed to expenditure underspend of close to \$15.3M. Expenditures are under budget primarily due to delays for minor capital project works (\$2.0M), delays for residuals dewatering work (\$2.3M) at Iona, salary and some external consulting underspends across multiple programs (\$4.4M), project delivery department under-allocation (\$2.8M) due to work delays, wastewater permit fee increase delay (\$0.9M) combined with less debt servicing costs (\$2.9M). The overall revenues are under (\$1.3M) primarily due to less reserve use (for SIF and other reserve funded projects and other work with underspends.)
Expenditures	392,967,276	377,694,968	15,272,308	
Surplus (Deficit)	-	14,021,176	14,021,176	
Greater Vancouver Sewerage and Drainage District				
Solid Waste Services				
Revenues	122,991,007	138,651,852	15,660,845	Solid Waste shortfall for the year is \$2.3M, which will be covered by operating reserves. Tipping fee revenues are higher than budget and close to 12% higher than the same period in 2021. The increased fees are due to higher construction demolition materials processing, facility residuals, which historically haven't been delivered to the regional solid waste system. Economic recovery following the pandemic contributes to the increases in waste quantities. User fees/other revenues were higher than budget by \$15.7M. Higher waste flows (1,028K versus budgeted tonnage of 890K) drove the majority of this excess revenue compared to budget for 2022. Although revenues were higher than anticipated, expenditures were \$18.0M higher than budget. This overage is mainly a result of higher contingency disposal costs of \$21M and higher landfill closure and post closure costs of \$6.7M. These overages are offset by \$1.6M in lower debt servicing costs, \$4.1M less operational costs and \$4.0M less contributions than planned.
Expenditures	122,991,007	140,994,616	(18,003,609)	
Surplus (Deficit)	-	(2,342,764)	(2,342,764)	
Metro Vancouver Housing Corporation				
Revenues	54,798,873	51,609,155	(3,189,718)	Housing's rental revenues have outperformed budget by close to \$1.2M due to lower than expected tenant rental assistance than anticipated in the budget plus other revenues of close to \$1.2M (including grants) exceeded the budget. Operating expenditures were lower than budget by close to \$2.8M due primarily to underspends and delays in property operations, administrative support and some maintenance program work. The net results for the Housing function were (\$0.4M) short of the planned contribution to reserves of \$10.7M.
Expenditures	54,798,873	41,299,758	13,499,115	
Surplus (Deficit)	-	10,309,397	10,309,397	
Metro Vancouver Regional District				
Revenues	116,974,355	111,058,218	(5,916,137)	Regional District expenditures were lower than budget largely due to lower salary costs due to vacancies from staff turnover and the timing of new position hiring. In addition to salary underspends, there was less spending in consulting and contract services from projects and other work delays in a number of functions plus fewer meetings, travel, tuition and catering costs than was anticipated in the budgets.
Expenditures	116,974,355	104,410,054	12,564,301	
Surplus (Deficit)	-	6,648,164	6,648,164	

Capital Annual Expenditure Summary

Metro Vancouver					
2022 Capital Spending Summary					
For the 12 months ending December 31, 2022					
	Annual	Year to Date			
	2022	2022 Capital Cash	Actual	% of Prorated	% of Annual
	Capital Cash Flow	Flow to	Expenditures	Capital Cash Flow	Capital Cash Flow
		December 2022			
Housing Services					
Development Capital	48,300,000	48,300,000	16,041,736		
	<u>48,300,000</u>	<u>48,300,000</u>	<u>16,041,736</u>	33.2%	33.2%
Liquid Waste Services					
Collections	187,337,000	187,337,000	71,476,489		
Treatment Plants	593,115,000	593,115,000	328,907,493		
	<u>780,452,000</u>	<u>780,452,000</u>	<u>400,383,982</u>	51.3%	51.3%
Regional Parks					
Capital Development	15,505,000	15,505,000	4,245,240		
Parkland Acquisition Fund Projects	15,750,000	15,750,000	5,151,727		
	<u>31,255,000</u>	<u>31,255,000</u>	<u>9,396,967</u>	30.1%	30.1%
Solid Waste Services					
Landfills	2,350,000	2,350,000	377,964		
Recycling and Waste Centres	28,900,000	28,900,000	35,180,833		
Waste To Energy Facilities	17,750,000	17,750,000	3,544,133		
Opportunity	1,840,000	1,840,000	331,801		
	<u>50,840,000</u>	<u>50,840,000</u>	<u>39,434,732</u>	77.6%	77.6%
Water Services					
Water Mains	333,800,000	333,800,000	213,725,699		
Pump Stations	39,050,000	39,050,000	11,394,558		
Reservoirs	44,004,000	44,004,000	19,658,300		
Treatment Plants	22,025,000	22,025,000	2,526,923		
Others	32,394,000	32,394,000	50,511,428		
	<u>471,273,000</u>	<u>471,273,000</u>	<u>297,816,909</u>	63.2%	63.2%
Total	<u>1,382,120,000</u>	<u>1,382,120,000</u>	<u>763,074,326</u>	55.2%	55.2%

- Overall, total capital expenditures for 2022 were \$763.1M, which represents 55.2% of the annual capital cash flow of \$1.4B.
- For Liquid Waste, total capital expenditures for 2022 were \$400.4M, which represents 51.3% of the annual capital cash flow of \$780.5M. The underspend is primarily due to some delays in initiating construction as well as issues on the North Shore Secondary Wastewater Treatment Plant.
- For Water, total capital expenditures for 2022 were \$297.8M, which represents 63.2% of the annual cash flow of \$471.3M. The underspend is primarily due to delays in permitting, limited market capacity for projects and construction delays.

**METRO VANCOUVER DISTRICTS
AND METRO VANCOUVER HOUSING CORPORATION

(OPERATING AS METRO VANCOUVER)**

Financial Statements

Year ended December 31, 2022

DRAFT - April 13, 2023

Consolidated Financial Statements of

**METRO VANCOUVER
REGIONAL DISTRICT
(OPERATING AS METRO VANCOUVER)**

Year ended December 31, 2022

METRO VANCOUVER REGIONAL DISTRICT

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December 31, 2022

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**METRO VANCOUVER DISTRICTS
AND METRO VANCOUVER HOUSING CORPORATION
(Operating as Metro Vancouver)
MANAGEMENT REPORT**

The Consolidated Financial Statements contained in this report have been prepared by management in accordance with Canadian public sector accounting standards. The integrity and objectivity of these statements are management's responsibility. Management is responsible for all the statements and schedules, and for ensuring that this information is consistent, where appropriate, with the information contained in the financial statements.

Management is also responsible for implementing and maintaining a system of internal controls to provide reasonable assurance that reliable financial information is produced.

The Metro Vancouver Regional District's Board of Directors is responsible for approving the consolidated financial statements and for ensuring that management fulfills its responsibilities for financial reporting and internal control and exercises this responsibility through the Finance Committee of the Board.

The external auditors, BDO Canada LLP, conduct an independent examination, in accordance with Canadian generally accepted auditing standards, and express their opinion on the consolidated financial statements. Their examination does not relate to the other unaudited schedules attached to the financial statements and statements required by the *Financial Information Act*. The Independent Auditor's Report outlines the scope of the audit for the year ended December 31, 2022.

On behalf of the Metro Vancouver Regional District, Greater Vancouver Sewerage and Drainage District, Greater Vancouver Water District, and Metro Vancouver Housing Corporation.

Dean Rear, Chief Financial Officer

Date: April 28, 2023

Independent Auditor's Report

To the Board of Directors of the Metro Vancouver Regional District

Opinion

We have audited the consolidated financial statements of the Metro Vancouver Regional District (the "Consolidated Entity"), which comprise the consolidated Statement of Financial Position as at December 31, 2022, and the consolidated Statements of Operations, Change in Net Debt and Cash Flows for the year then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Consolidated Entity as at December 31, 2022 and the results of its operations, change in net debt, and cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Consolidated Financial Statements section of our report. We are independent of the Consolidated Entity in accordance with the ethical requirements that are relevant to our audit of the consolidated financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Consolidated Entity's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Consolidated Entity or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Consolidated Entity's financial reporting process.

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Consolidated Entity's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Consolidated Entity's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Consolidated Entity to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Other Matter – Supplementary Information

We draw attention to the fact that the supplementary information included in Schedule 1 does not form part of the audited consolidated financial statements. We have not audited or reviewed this supplementary information and, accordingly, we do not express any opinion, review conclusion or any other form of assurance on this supplementary information.

Chartered Professional Accountants

Vancouver, British Columbia
REPORT DATE

METRO VANCOUVER REGIONAL DISTRICT

Exhibit A

Consolidated Statement of Financial Position

As at December 31, 2022

(in thousands of dollars)

	2022	2021
Financial Asset		
Cash and cash equivalents	\$ 388,043	\$ 738,303
Accounts receivable (note 2)	193,673	193,051
Due from TransLink and member municipalities (note 3)	1,260,527	1,094,140
Investments (note 4)	391,386	289,582
Debt reserve fund (note 5)	65,522	64,388
	2,299,151	2,379,464
Liabilities		
Accounts payable and accrued liabilities (note 6)	299,379	337,420
Employee future benefits (note 7)	14,602	13,907
Landfill closure and post-closure liability (note 8)	41,026	32,907
Deferred revenue and refundable deposits (note 9)	343,047	341,016
Debt reserve fund, member municipalities, and TransLink (note 5)	35,231	35,179
Debt (net of sinking funds) (note 10)		
Metro Vancouver Districts and Housing Corporation	1,884,302	1,851,489
TransLink and member municipalities	1,246,714	1,083,106
Total debt	3,131,016	2,934,595
	3,864,301	3,695,024
Net Debt	(1,565,150)	(1,315,560)
Non-Financial Assets		
Tangible capital assets (note 11)	7,796,302	7,172,479
Inventories of supplies	11,864	10,938
Prepaid land leases (note 12)	4,868	5,062
Prepaid expenses	11,714	8,723
	7,824,748	7,197,202
Accumulated Surplus (note 13)	\$ 6,259,598	\$ 5,881,642
Contractual obligations and rights (note 14)		
Contingencies (note 15)		
Budget information (note 16)		
Segmented information and expenses by object (note 17)		
Subsequent events (note 18)		

The accompanying notes are an integral part of these consolidated financial statements.

Chief Financial Officer

Board Chair

METRO VANCOUVER REGIONAL DISTRICT

Exhibit B

Consolidated Statement of Operations

Year ended December 31, 2022

(in thousands of dollars)

	2022 Budget (Note 16)	2022 Actual	2021 Actual
Revenues (note 17)			
MVRD property tax requisitions	\$ 91,708	\$ 91,708	\$ 82,714
Metered sale of water	329,366	329,678	319,989
Sewerage and drainage levy	301,425	301,425	288,226
Tipping fees	112,910	125,797	112,610
Housing property rentals	42,051	43,267	42,416
BODTSS industrial charges	12,263	12,431	12,157
Development cost charges	103,080	60,583	42,204
Grants and other contributions	126,822	37,265	76,174
User fees, recoveries, and other revenue	41,175	46,411	42,903
Sinking fund and interest income	32,110	38,682	32,840
Sinking fund income, members and TransLink	29,165	27,072	28,222
	1,222,075	1,114,319	1,080,455
Expenses (note 17)			
Liquid waste services	294,631	274,160	232,928
Solid waste services	119,856	142,930	108,040
Water operations	197,307	184,446	173,128
Housing rental operations	41,452	34,516	35,765
Regional parks	46,045	38,405	37,310
General government services	7,400	7,167	6,257
Air quality	14,826	11,101	10,082
Regional employers services	3,204	2,362	2,342
E911 emergency telephone system	5,333	5,269	4,543
Regional planning	4,756	4,140	3,101
Invest Vancouver	3,038	2,420	1,556
Housing planning and policy	1,794	1,031	1,085
Electoral areas	632	654	455
Regional global positioning system	348	169	242
Sasamat volunteer fire department	294	350	263
Regional emergency management	234	171	78
Sinking fund income attributed to members and TransLink	29,165	27,072	28,222
	770,315	736,363	645,397
Annual surplus	451,760	377,956	435,058
Accumulated surplus, beginning of year	5,881,642	5,881,642	5,446,584
Accumulated surplus, end of year (note 13)	\$ 6,333,402	\$ 6,259,598	\$ 5,881,642

The accompanying notes are an integral part of these consolidated financial statements.

METRO VANCOUVER REGIONAL DISTRICT

Exhibit C

Consolidated Statement of Change in Net Debt

Year ended December 31, 2022

(in thousands of dollars)

	2022 Budget (Note 16)	2022 Actual	2021 Actual
Annual surplus	\$ 451,760	\$ 377,956	\$ 435,058
Change in tangible capital assets			
Acquisition of tangible capital assets	(1,390,548)	(723,206)	(720,501)
Amortization of tangible capital assets	96,073	99,142	86,415
Net book value of tangible capital assets disposed	—	241	1,110
	(1,294,475)	(623,823)	(632,976)
Change in other non-financial assets			
Acquisition of prepaid expenses	—	(11,714)	(8,723)
Use of prepaid expenses	—	8,723	9,350
Amortization of prepaid land leases	194	194	195
Acquisition of inventories of supplies	—	(11,864)	(10,938)
Consumption of inventories of supplies	—	10,938	10,017
	194	(3,723)	(99)
Change in net debt	(842,521)	(249,590)	(198,017)
Net debt, beginning of year	(1,315,560)	(1,315,560)	(1,117,543)
Net debt, end of year	\$ (2,158,081)	\$ (1,565,150)	\$ (1,315,560)

The accompanying notes are an integral part of these consolidated financial statements.

METRO VANCOUVER REGIONAL DISTRICT

Exhibit D

Consolidated Statement of Cash Flows

Year ended December 31, 2022

(in thousands of dollars)

	2022	2021
Cash provided by (used in):		
Operating transactions:		
Annual surplus	\$ 377,956	\$ 435,058
Items not involving cash		
Amortization of tangible capital assets	99,142	86,415
Amortization of prepaid land leases	194	195
Sinking fund income	(54,931)	(53,932)
Debt reserve fund income	(1,455)	(1,065)
Accrued interest and unamortized premium or discount	(718)	(2,029)
Gain (loss) on disposal of tangible capital assets and asset held for sale	(1,359)	743
Employee future benefit expense	2,911	2,868
Change in landfill closure and post-closure liability	8,119	743
Change in non-cash financial assets and liabilities		
Accounts receivable	(622)	(42,424)
Due from TransLink and member municipalities	(166,387)	(93,341)
Accounts payable and accrued liabilities	(38,041)	88,148
Employee future benefits paid	(2,216)	(2,330)
Deferred revenue and refundable deposits	2,031	29,565
Debt reserve fund, member municipalities, and TransLink	52	(424)
Inventories of supplies	(926)	(921)
Prepaid expenses	(2,991)	627
Net change in cash from operating transactions	220,759	447,896
Capital transactions:		
Proceeds on sale of tangible capital assets	1,600	367
Acquisition of tangible capital assets	(723,206)	(720,501)
Net change in cash from capital transactions	(721,606)	(720,134)
Investing transactions:		
Acquisition of investments	(403,818)	(160,752)
Investment maturities	302,732	290,591
Net change in cash from investing transactions	(101,086)	129,839
Financing transactions:		
Debenture debt and mortgages issued	452,970	779,600
Debt reserve fund issuances	(4,530)	(7,796)
Debt reserve fund maturity	4,851	3,915
Sinking fund payments	(193,570)	(158,391)
maturity	(8,048)	(8,136)
Sinking fund retirement	182,352	142,080
Debenture debt maturity	(182,352)	(142,080)
Net change in cash from financing transactions	251,673	609,192
Net change in cash and cash equivalents	(350,260)	466,793
Cash and cash equivalents, beginning of year	738,303	271,510
Cash and cash equivalents, end of year	\$ 388,043	\$ 738,303

The accompanying notes are an integral part of these consolidated financial statements.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 1

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

1. Significant Accounting Policies

The consolidated financial statements of the Metro Vancouver Regional District (the “District”) are prepared by management in accordance with Canadian public sector accounting standards. Significant accounting policies adopted by the District are as follows:

Government Reporting Entity

The consolidated financial statements include the assets, liabilities, revenues, and expenses of four legal entities: the Metro Vancouver Regional District (“MVRD”), the Greater Vancouver Sewerage and Drainage District (“GVS&DD”), the Greater Vancouver Water District (“GVWD”), and the Metro Vancouver Housing Corporation (“MVHC”).

The MVRD was established under the Local Government Act of British Columbia. It provides a number of specific and agreed upon services directly to the public and its member municipalities, the major one of which is the ownership and operation of a network of regional parks. Its Board of Directors comprises mayors and councilors from the member municipalities appointed for that purpose by the municipalities. The number of directors, and the number of votes each may cast, is based upon the population of the municipality. Under the legislation, all staff, even if their work is under the authority of the related legal entities, are employees of the MVRD.

The GVS&DD was established by an Act of the same name in 1956. Its two principal responsibilities are the collection, treatment, and discharge of liquid waste for the municipalities of the MVRD, and the disposal of solid waste for the municipalities of the MVRD and the public. GVS&DD owns and operates wastewater treatment plants and a related collection network connected to the municipal collection systems, and several solid waste facilities including a waste-to-energy facility. Its Board of Directors comprises the same councilors and mayors as appointed to the MVRD Board by the participating municipalities.

The GVWD was established by an Act of the same name in 1924. Its primary responsibility is the supply of potable water to its member municipalities. Its Board of Directors comprises the same councilors and mayors as appointed to the MVRD Board by the participating municipalities. GVWD owns or holds under a 999-year lease from the Province, an extensive closed watershed network as its source of supply. It owns a series of dams, reservoirs, water treatment plants and a distribution network connecting to the municipal distribution systems. GVWD also owns and is responsible for operating and maintaining office buildings that are leased to MVRD and its related entities.

The MVHC is a wholly-owned subsidiary of the MVRD. The MVHC was incorporated under the Business Corporations Act (British Columbia) to own and operate housing sites within the Lower Mainland for the purpose of providing affordable rental housing on a non-profit basis.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 2

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

1. Significant Accounting Policies (continued)

Basis of Consolidation

The consolidated financial statements reflect the combined assets, liabilities, revenues, and expenses of the reporting entity. The reporting entity comprises the MVRD, the GVS&DD, the GVWD, and the MVHC. These organizations are controlled by the District. All transactions and balances between these legal entities have been eliminated on consolidation.

Basis of Accounting

The District follows the accrual method of accounting for revenue and expenses. Revenue is recognized in the year in which it is earned and measurable. Expenses are recognized as they are incurred and measurable as a result of the receipt of goods or services and/or the legal obligation to pay.

Government Transfers

Government transfers, are recognized as revenue in the financial statements when the transfer is authorized and any eligibility criteria are met, except to the extent that transfer stipulations give rise to an obligation that meets the definition of a liability. The transfer of revenue is initially deferred and then recognized in the statement of operations as the stipulation liabilities are settled.

When the District is deemed the transferor, the transfer expense is recognized when the recipient is authorized and has met the eligibility criteria.

Deferred Revenue and Refundable Deposits

Deferred revenue represents licenses, permits, development cost charges, security deposits, restricted contributions, and other fees which have been collected, but for which the related services or obligations have yet to be performed. These amounts will be recognized as revenue in the fiscal year the services are performed or obligations and stipulations have been met.

Sinking Fund, Debt Retirement, and Interest Income

Interest income is reported as revenue in the period earned. When required, based on external restrictions, interest income earned on deferred revenue is added to and forms part of the deferred revenue balance, and is recognized into income when related stipulations are met. Any surpluses received from upon debt retirement are recorded in the year received.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 3

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

1. Significant Accounting Policies (continued)

Cash Equivalents	Cash equivalents include highly liquid financial instruments with a term to maturity of ninety days or less at the date of acquisition. Cash equivalents are recorded at the lower of cost plus accrued interest.
Investments	Investments consist of both long and short-term instruments and are recorded at amortized cost using straight-line method.
Employee Future Benefits	<p>The District and its employees participate in the Municipal Pension Plan. The Municipal Pension Plan is a multi-employer contributory defined benefit pension plan. Payments made in the year are expensed.</p> <p>Under the terms of various collective agreements and compensation policies, the District provides paid sick leave to eligible employees and in certain agreements allows unused sick days to accumulate. There are no payouts of unused sick days at termination. In addition, employees acquire certain employee benefits on termination and retirement. These include days for severance based on years of service, vacation based on years of service, Worker's Compensation top-up, and a full year's vacation entitlement in the year of retirement. The costs of these benefits are actuarially determined based on service and best estimates of retirement ages and expected future salary and wage increases. The obligation under these benefit plans is accrued based on projected benefits as the employees render services necessary to earn the future benefits. Actuarial gains and losses are amortized over the expected average remaining service period of the related employee group, commencing the year after the gain or loss arises.</p>
Landfill Closure and Post-Closure Liability	The estimated present value of landfill closure and post-closure costs is recognized as a liability. This liability is recognized based on estimated future expenses, including estimated inflation discounted to the current date and accrued based on the proportion of the total capacity of the landfill used as of the date of the statement of financial position. The change in this estimated liability during the year is recorded as an expense in operations. These estimates are reviewed and adjusted annually and any changes are recorded on a prospective basis.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 4

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

1. Significant Accounting Policies (continued)

Non-Financial Assets

Non-financial assets are not available to discharge existing liabilities and are held for use in the provision of services. They have useful lives extending beyond the current year and are not intended for sale in the ordinary course of operations.

Tangible Capital Assets

Tangible capital assets are recorded at cost which includes amounts that are directly attributable to acquisition, construction, development, or betterment of the asset. The cost, less residual value, of the tangible capital assets, except land, is amortized over their estimated useful lives. All assets are amortized on a straight line basis as follows:

Asset	Useful Life - Years
Buildings	
Housing	25 – 35
Parks	50
Watershed	25
Corporate – Head Office	40
Infrastructure	
Sewer	
Wastewater treatment, pumping stations	50
Interceptors and trunk sewer, drainage	100
Solid Waste	25 – 30
Water	
Dams, reservoirs	150
Supply mains	100
Distribution systems, drinking water treatment	50
Parks	
Bridges, culverts, fencing	20 – 40
Trails	100
Roads, erosion protection, water and sewer systems	100
Information technology systems and networks	5 – 10
Vehicles	5 – 20
Machinery, equipment, furniture, and fixtures	5 – 20

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 5

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

1. Significant Accounting Policies (continued)

Non-Financial Assets (continued)

Tangible Capital Assets

a. Annual amortization

Annual amortization begins when the asset is available for use and is expensed over its useful life. Assets under construction are transferred to the appropriate asset class and are amortized from the date the asset is available for use.

b. Contributions of tangible capital assets

Contributions of tangible capital assets are recorded at their estimated fair value at the date of receipt and as contribution revenue.

c. Works of art and cultural and historic assets

Works of art and cultural and historic assets are not recorded as assets in these financial statements.

d. Interest capitalization

The Districts do not capitalize interest costs associated with the acquisition or construction of a tangible capital asset.

Inventories of Supplies

Inventories of supplies held for consumption are recorded on a first-in, first-out basis.

Prepaid Land Leases

Prepaid land leases are recorded at historical cost less accumulated amortization. Upon expiration of the lease contract, the property will revert to the lessor. Prepaid land leases are amortized on a straight-line basis over the lease term.

Revenue Recognition

Property tax revenues and sewerage and drainage revenues from member municipalities are recognized in the year they are levied. Metered sale of water, tipping fees, permits, cost sharing, and other revenues are recognized as revenue on an accrual basis according to the usage and rates approved and set by the Board. Housing property rental revenue is recognized over the rental period once the tenant commences occupancy, rent is due and collection is assured.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 6

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

1. Significant Accounting Policies (continued)

Segmented Information

A segment is defined as a distinguishable activity or group of activities of a government for which it is appropriate to separately report financial information to achieve the objectives of the standard. The District has provided definitions of the District's segments as well as presented financial information in segmented format in note 17.

Liability for Contaminated Sites

A liability for remediation of a contaminated site is recognized when the site is no longer in productive use and the following criteria are satisfied: an environmental standard exists; contamination exceeds the standard; the District is either directly responsible or has accepted responsibility for remediation; it is expected that future economic benefits will be given up and a reasonable estimate of the liability can be made. Liabilities for contaminated sites is reported in accounts payable and accrued liabilities (note 6).

Use of Estimates

The preparation of these financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the period. These estimates and assumptions are based on management's best information and judgment and may differ from actual results. Adjustments, if any, will be reflected in the financial statements in the period that the change in estimate is made, as well as in the period of settlement if the amount is different.

Significant areas requiring the use of management's judgment relate to the determination of contaminated sites liabilities, the employee future benefits liability, the estimate of accruals for projects in progress, amortization rates and useful lives for tangible capital assets, the landfill closure and post-closure liability, the assessment of the impairment of tangible capital assets and work in progress, and the assessment of the outcome of contingent liabilities.

2. Accounts Receivable

	2022	2021
GVWD	\$ 68,590	\$ 48,357
GVS&DD	108,083	139,016
MVHC	2,743	624
MVRD	14,257	5,054
	\$ 193,673	\$ 193,051

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 7

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

3. Due from TransLink and Member Municipalities

The District is reimbursed for amounts paid to the Municipal Finance Authority of British Columbia ("MFA") for the obligations incurred on behalf of its member municipalities and TransLink whose undertakings were financed out of the proceeds of these obligations (refer to note 10). The amount recoverable is net of sinking funds, held and invested by the MFA, and includes accrued interest as follows:

	Net Debt Recoverable	Accrued Interest	2022	2021
TransLink	\$ 234,324	\$ 5,169	\$ 239,493	\$ 286,467
Member municipalities	1,012,390	8,644	1,021,034	807,673
	\$ 1,246,714	\$ 13,813	\$ 1,260,527	\$ 1,094,140

4. Investments

	Yields	Maturity Dates	2022	2021
Bonds:				
Government	1.91% - 3.11%	April 2023 - March 2031	\$ 60,657	\$ 78,983
Corporate	1.97% - 5.86%	June 2024 - March 2028	47,583	51,172
Unamortized premium			4,646	3,927
			112,886	134,082
Term deposits	1.30% - 5.25%	January 2023 - July 2025	63,500	98,000
GICs	1.20% - 4.57%	January 2023 - April 2028	215,000	57,500
Total			\$ 391,386	\$ 289,582

Government bonds include debt securities issued by the federal and provincial governments of Canada, and the Municipal Finance Authority of British Columbia. Corporate bonds include Schedule I and II Chartered Banks of Canada.

Market value of investments as at December 31, 2022 was \$393,365,298 (2021 - \$294,798,145).

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 8

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

5. Debt Reserve Fund

The MFA provides financing for regional districts and member municipalities. The MFA is required to establish a Debt Reserve Fund for each debenture issue equal to one-half the average annual installment of principal and interest. The debt reserve fund is comprised of cash deposits equal to 1% of the principal amount borrowed and a non-interest bearing demand note for the remaining requirement. Cash deposits held by the MFA are payable with interest to the ultimate borrower when the final obligations under the respective loan agreements have been made.

If, at any time, the District has insufficient funds to meet payments due on its obligations to the MFA, the payments will be made from the debt reserve fund. The demand notes are callable only if there are additional requirements to be met to maintain the level of the debt reserve fund. At December 31, 2022, \$130,539,983 (2021 - \$122,534,444) in callable demand notes were outstanding and have not been recorded in the statement of financial position.

	2022	2021
Cash deposits held by MFA on behalf of:		
TransLink and member municipalities	\$ 35,231	\$ 35,179
Metro Vancouver Districts	30,291	29,209
	\$ 65,522	\$ 64,388

6. Accounts Payable and Accrued Liabilities

	2022	2021
Trade accounts	\$ 166,809	\$ 233,799
Construction holdbacks	79,654	65,181
Accrued interest on debt	27,606	23,429
Wage accruals	23,815	14,249
Contaminated sites (a)	1,495	762
	\$ 299,379	\$ 337,420

(a) In 2022, the District accrued \$1,494,860 to remediate contaminated soils at two of its properties within the GVWD. The remediation work for the properties will be completed in 2024 and 2026. The remediation work accrued in 2021 within the GVS&DD was completed.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 9

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

7. Employee Future Benefits

The employee future benefits have been based on the results of an actuarial valuation done by an independent actuarial firm. A full valuation was performed as of December 31, 2022.

Information about liabilities for the District's employee benefit plans is as follows:

	2022	2021
Accrued benefit obligation:		
Balance, beginning of year	\$ 19,008	\$ 20,362
Current service cost	1,572	1,656
Interest cost	467	376
Benefits paid	(2,216)	(2,330)
Workers compensation top-up	—	(120)
Actuarial loss	(204)	(936)
Accrued benefit obligation, end of year	18,627	19,008
Unamortized actuarial loss	(4,025)	(5,101)
Accrued benefit liability, end of year	\$ 14,602	\$ 13,907
	2022	2021
Employee future benefit expense:		
Current service cost	\$ 1,572	\$ 1,656
Interest cost	467	376
Workers compensation top-up	—	(120)
Amortization of the actuarial loss	872	956
	\$ 2,911	\$ 2,868

The significant actuarial assumptions adopted in measuring the District's accrued benefit obligation are as follows:

	2022	2021
Discount rate	4.4%	2.4%
Expected future inflation rate	2.5%	2.0%
Expected average remaining service period	12 years	11 years

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 10

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

8. Landfill Closure and Post-Closure Liability

The District is responsible for its share of closure and post-closure costs at landfill sites as detailed below.

- a) The Vancouver landfill is located in Delta, BC. In accordance with an agreement with the City of Vancouver, the District is responsible for its proportionate share of the closure and post-closure liability based on usage. The present value of the District's estimated future liability for these expenses is recognized as the landfill site's capacity is used and is as follows:

	2022	2021
Landfill closure and post closure liability	\$ 41,026	\$ 32,907

The closure and post-closure liability and annual expense is calculated based on the ratio of actual utilization to total expected utilization of the site's capacity at the date of closure. It is based on estimates and assumptions with respect to events extending over the remaining life of the Vancouver landfill, including provisions contained in Metro Vancouver's Integrated Solid Waste and Resource Management Plan. The significant estimates and assumptions adopted in measuring the District's share of the closure and post-closure liability are as follows:

	2022	2021
Current actual utilization (in 000's tonnes)	23,196	22,521
tonnes)	28,300	28,219
Expected remaining capacity (in 000's tonnes)	5,104	5,698
Permitted capacity (in 000's tonnes)	33,039	33,039
Future costs (in \$000's)	\$ 212,638	\$ 197,189
Present value of future costs (in \$000's)	\$ 136,569	\$ 115,934
Proportionate share of liability	36.65%	35.57%
Utilization of total capacity, end of year	81.97%	79.81%
Discount rate	2.58%	2.73%
Expected post-closure period	30 years	30 years
Expected closure date	December 31, 2037	December 31, 2037

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 11

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

8. Landfill Closure and Post-Closure Liability (continued)

- b) The Cache Creek landfill is located in the Village of Cache Creek, BC. The landfill permit obligates the Village of Cache Creek and a third party service provider to undertake closure and post-closure activities. The District, in accordance with an agreement with the Village, was required to contribute quarterly to a trust fund, held with the Province of British Columbia, to a Post Closure Maintenance and Repair Fund at rates consistent with the operational certificate for the landfill. The agreement indemnifies the Village for any post closure liabilities not covered by this fund. At December 31, 2022, the lower of amortized book value and market value of the trust was \$15,403,059 (2021 - \$16,261,510), which approximates the post-closure liability.

The Cache Creek landfill was closed December 2016. The actual utilization at closure was 10,319 thousand tonnes and the permitted capacity was 10,372 thousand tonnes. The post-closure period is expected to be 30 years. The present value of District's estimated future post-closure liability is sufficiently funded by the trust.

9. Deferred Revenue and Refundable Deposits

The deferred revenue consists of the following:

	2022	2021
MVHC externally restricted funds from BCHMC (a)		
i) Rental operations	\$ 48	\$ 47
ii) Replacement projects	3,457	3,376
	3,505	3,423
GVS&DD development cost charges (b)	273,596	258,634
Provincial grant to fund capital expenditures (c)	56,496	69,696
Facility rental security deposits	6,414	6,360
Other	3,036	2,903
Total	\$ 343,047	\$ 341,016

- (a) Amounts received under the following MVHC programs have been recorded as deferred revenue:

- i) Rental Operations: Under operating agreements entered into with Canada Mortgage and Housing Corporation ("CMHC") and administered by British Columbia Housing Management Commission ("BCHMC") (Homes BC, Seniors, and Investment in Housing Innovation properties), a portion of the funds received from rental operations are restricted and can only be used by MVHC according to the terms of the agreements. Restricted amounts are recorded as deferred revenue and are used when expenditures exceed revenue in the program.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 12

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

9. Deferred Revenue and Refundable Deposits (continued)

- ii) Replacement Projects: Under operating agreements entered into with Canada Mortgage and Housing Corporation ("CMHC") and administered by BCHMC (Homes BC, Seniors, and Investment in Housing Innovation properties), a portion of the funds received from rental operations are restricted for the replacement of equipment and specified building components. These funds are deferred until spent on approved items.
- (b) The *Greater Vancouver Sewerage and Drainage District Act* restricts the District to applying money raised from development cost charges to funding sewer capital projects, including the repayment of debt raised to fund such projects.
- (c) In 2017, the GVS&DD received a grant from the Province of British Columbia in the amount of \$193.0 million for costs associated with the construction of the new North Shore Wastewater Treatment Plant Facility. During 2022, \$15.39 million (2021 - \$20.49 million) was applied against the project and recognized as revenue.

Continuity of deferred revenue and refundable deposits is as follows:

	2022	2021
Balance, beginning of year	\$ 341,016	\$ 311,451
Externally restricted contributions received:		
GVS&DD development cost charges	68,941	85,105
MVHC restricted funds	1,035	1,420
Interest earned	8,275	3,628
Total contributions received	78,251	90,153
Contributions used and recognized in revenue	(77,275)	(63,781)
Net change in externally restricted contributions	976	26,372
Change in deposits and other deferred revenues	1,055	3,193
	2,031	29,565
Balance, end of year	\$ 343,047	\$ 341,016

10. Debt

- a) The District serves as the borrowing conduit between member municipalities (excluding the City of Vancouver) and the MFA. The GVS&DD and GVWD also access the MFA through the MVRD. Prior to 2007, the District also served as the borrowing conduit for the Greater Vancouver Transportation Authority, commonly referred to as "TransLink". The District, TransLink, and the municipalities in the transportation service region are jointly and severally liable for obligations arising under a security issued by the District on behalf of TransLink.
- b) All monies borrowed are upon the District's credit at large and, in the event of any default, would constitute an indebtedness for which its members are jointly and severally liable.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 13

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

10. Debt (continued)

- c) Debt servicing requirements comprising sinking fund contributions, serial and mortgage principal repayments and interest are funded as incurred by revenue earned during the year.
- d) Sinking fund installments are invested by the MFA and earn income which, together with principal payments, are expected to be sufficient to retire the sinking fund debt at maturity. For sinking fund agreements, the MFA has established either a normal sinking fund or a capital repayment equalization fund.
- e) In addition to debt incurred directly by the District, the District has also incurred long-term debt on behalf of its member municipalities and TransLink through agreements with the MFA. Under the terms of these agreements, the District is required to provide for and pay to the MFA certain sums. Debt incurred on behalf of others is also presented as due from TransLink and member municipalities (note 3). Where the MFA has determined that sufficient resources exist to retire a debenture on its maturity date without further installments, debenture installments are suspended by the MFA. If the sums provided for are not sufficient, such deficiency shall be a liability of the District to the MFA until legally extinguished.

The District is reimbursed for amounts paid to the MFA for the obligations incurred on behalf of the member municipalities and TransLink whose undertakings were financed out of the proceeds of these obligations.

The following summarizes the debt incurred by the District as well as debt incurred on behalf of the member municipalities and TransLink.

	Mortgages and Debenture Debt	Less Sinking Funds	Debt, Net of Sinking Fund	
			2022	2021
GVS&DD	\$ 1,431,000	\$ 252,856	\$ 1,178,144	\$ 1,094,985
GVWD	1,207,631	544,120	663,511	711,163
MVHC	42,647	—	42,647	45,341
	2,681,278	796,976	1,884,302	1,851,489
TransLink	713,606	479,282	234,324	281,223
Member municipalities	1,254,441	242,051	1,012,390	801,883
	1,968,047	721,333	1,246,714	1,083,106
	\$ 4,649,325	\$ 1,518,309	\$ 3,131,016	\$ 2,934,595

- f) Debt (net of sinking funds) reported on the statement of financial position is comprised of the following and includes varying maturities up to 2055, with interest rates ranging from 0.30% to 5.65%.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 14

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

10. Debt (continued)

Issue number	Interest rate - %	Maturity date	Authorized to be issued	Debt Outstanding	
				2022	2021
Sinking Fund Agreements					
67	0.70-1.75	November 5, 2022	\$ 15,000	\$ —	\$ 15,000
77	0.65-1.75	June 1, 2022	100,100	—	84,100
78	2.25	December 3, 2022	89,252	—	1,252
79	2.25	June 3, 2023	74,025	225	225
85	2.25-5.47	December 2, 2024	69,760	22,760	22,760
86	5.44	December 2, 2024	50,000	50,000	50,000
95	4.77	October 13, 2025	10,900	2,300	2,300
96	4.61	April 2, 2026	50,000	50,000	50,000
97	1.53-4.90	April 19, 2036	175,000	153,000	153,000
99	4.99	October 19, 2026	66,300	16,300	16,300
100	4.59	October 19, 2026	200,000	180,000	180,000
102	2.25-5.09	December 1, 2027	436,395	289,395	369,395
103	2.65	April 23, 2023	40,000	40,000	40,000
104	2.90	November 20, 2028	56,281	56,281	56,281
105	2.25	June 3, 2029	68,300	68,300	68,300
106	2.25	October 13, 2039	140,600	125,000	125,000
110	1.28	April 8, 2030	60,730	60,730	60,730
112	1.28	October 6, 2035	74,775	74,775	74,775
116	1.47	April 4, 2036	152,292	152,292	152,292
118	3.39	April 11, 2042	96,000	96,000	96,000
120	0.30	June 29, 2022	2,000	—	2,000
121	3.39	October 4, 2037	74,961	72,286	72,286
124	3.15	April 8, 2043	3,000	3,000	3,000
126	3.85	September 26, 2043	155,209	155,209	155,209
127	3.30	April 7, 2034	115,415	115,415	115,415
130	3.00	October 14, 2029	50,000	50,000	50,000
131	2.20	April 8, 2035	121,500	121,500	121,500
137	2.60	April 19, 2046	149,772	149,772	149,772
139	2.10	October 5, 2031	55,000	55,000	55,000
141	2.80	April 7, 2047	152,463	152,463	152,463
142	3.15	October 4, 2047	77,983	77,983	77,983
145	3.15	April 23, 2048	122,275	122,275	122,275
146	3.20	September 19, 2048	282,500	282,500	282,500
147	2.66	April 9, 2034	62,000	62,000	62,000
149	2.24	October 9, 2049	140,095	140,095	140,095
150	1.99	April 9, 2050	168,133	168,133	168,133
151	1.28	June 1, 2050	185,987	185,987	185,987
153	2.41	April 15, 2046	129,000	129,000	129,000
154	2.41	May 28, 2036	500,000	500,000	500,000
156	2.58	September 27, 2046	150,600	150,600	150,600
157	3.36	April 8, 2037	207,500	207,500	—
158	4.09	September 23, 2052	245,470	245,470	—
Total sinking fund agreements (carried forward)			\$ 5,176,573	\$ 4,583,546	\$ 4,312,928

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 15

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

10. Debt (continued)

Issue number	Interest rate - %	Maturity date	Authorized to be issued	Debt Outstanding	
				2022	2021
Total sinking fund agreements (brought forward)			\$ 5,176,573	\$ 4,583,546	\$ 4,312,928
Serial Debt					
93	5.10-5.65	April 7, 2027	79,014	17,735	22,143
111	3.35	October 1, 2025	3,000	724	950
114	3.65	March 29, 2026	6,301	2,024	2,486
122	2.00	November 1, 2032	1,999	1,000	1,099
123	2.00	March 28, 2033	3,142	1,649	1,807
Total serial debt			93,456	23,132	28,485
Total debenture debt			\$ 5,270,029	\$ 4,606,678	\$ 4,341,413
MVHC Mortgages					
	1.44 - 4.87	January 2023 to December 2055		50,901	54,519
Less MVRD financed mortgages				(8,254)	(9,178)
Total MVHC mortgages				42,647	45,341
Total debt				4,649,325	4,386,754
Less sinking funds				(1,518,309)	(1,452,159)
Total debt, net of sinking funds				\$ 3,131,016	\$ 2,934,595

- g) Principal payments and sinking fund installments due within the next five years and thereafter are as follows:

	Total Long-Term Debt Payments	Less Recoverable from TransLink and Member Municipalities	Net Debt Payments
2023	\$ 216,337	\$ 69,699	\$ 146,638
2024	212,000	69,838	142,162
2025	197,289	63,051	134,238
2026	187,578	59,713	127,865
2027	173,438	48,306	125,132
Thereafter	1,327,343	489,606	837,737
Total payments	2,313,985	800,213	1,513,772
Estimated sinking fund income	817,031	446,501	370,530
Total net debt	\$ 3,131,016	\$ 1,246,714	\$ 1,884,302

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 16

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

11. Tangible Capital Assets

Year ended December 31, 2022

Cost				Accumulated Amortization					Net Book Value December 31, 2022
	Balance at December 31, 2021	Additions	Disposals	Balance at December 31, 2022	Balance at December 31, 2021	Disposals	Amortization Expense	Balance at December 31, 2022	
Land									
Sewer and Drainage District	\$ 162,872	\$ 23,590	\$ (104)	\$ 186,358	\$ —	\$ —	\$ —	\$ —	\$ 186,358
Water District	53,664	79,050	—	132,714	—	—	—	—	132,714
Regional District	914,517	5,152	—	919,669	—	—	—	—	919,669
Metro Vancouver Housing Corporation	52,274	—	—	52,274	—	—	—	—	52,274
	1,183,327	107,792	(104)	1,291,015	—	—	—	—	1,291,015
Infrastructure									
Sewer and Drainage District	2,168,652	300,885	—	2,469,537	708,339	—	44,809	753,148	1,716,389
Water District	2,245,795	180,999	—	2,426,794	437,619	—	36,322	473,941	1,952,853
Regional District	129,501	3,505	(1,257)	131,749	68,134	(1,257)	4,761	71,638	60,111
	4,543,948	485,389	(1,257)	5,028,080	1,214,092	(1,257)	85,892	1,298,727	3,729,353
Buildings									
Water District	216,476	—	—	216,476	24,688	—	5,463	30,151	186,325
Regional District	26,880	—	—	26,880	10,357	—	540	10,897	15,983
Metro Vancouver Housing Corporation	220,339	3,250	—	223,589	176,544	—	2,290	178,834	44,755
	463,695	3,250	—	466,945	211,589	—	8,293	219,882	247,063
Vehicles									
Regional District	30,621	2,195	(413)	32,403	24,452	(413)	2,325	26,364	6,039
	30,621	2,195	(413)	32,403	24,452	(413)	2,325	26,364	6,039
Machinery, equipment, furniture & fixtures									
Sewer and Drainage District	8,818	171	—	8,989	7,875	—	360	8,235	754
Water District	13,197	425	—	13,622	7,425	—	1,042	8,467	5,155
Regional District	21,169	773	(150)	21,792	18,428	(148)	743	19,023	2,769
Metro Vancouver Housing Corporation	6,439	619	(497)	6,561	4,743	(362)	487	4,868	1,693
	49,623	1,988	(647)	50,964	38,471	(510)	2,632	40,593	10,371
Construction in progress									
Sewer and Drainage District	1,579,940	65,368	—	1,645,308	—	—	—	—	1,645,308
Water District	796,461	36,874	—	833,335	—	—	—	—	833,335
Regional District	5,391	3,725	—	9,116	—	—	—	—	9,116
Metro Vancouver Housing Corporation	8,077	16,625	—	24,702	—	—	—	—	24,702
	2,389,869	122,592	—	2,512,461	—	—	—	—	2,512,461
	\$ 8,661,083	\$723,206	\$ (2,421)	\$9,381,868	\$1,488,604	\$ (2,180)	\$ 99,142	\$1,585,566	\$7,796,302
Totals 2022									
Sewer and Drainage District	\$ 3,920,282	\$390,014	\$ (104)	\$4,310,192	\$ 716,214	\$ —	\$ 45,169	\$ 761,383	\$3,548,809
Water District	3,325,593	297,348	—	3,622,941	469,732	—	42,827	512,559	3,110,382
Regional District	1,128,079	15,350	(1,820)	1,141,609	121,371	(1,818)	8,369	127,922	1,013,687
Metro Vancouver Housing Corporation	287,129	20,494	(497)	307,126	181,287	(362)	2,777	183,702	123,424
	\$ 8,661,083	\$723,206	\$ (2,421)	\$9,381,868	\$1,488,604	\$ (2,180)	\$ 99,142	\$1,585,566	\$7,796,302

Construction in progress includes \$522.6 million (2021- \$495.7 million) related to the North Shore Wastewater Treatment Plant Project (note 15).

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 17

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

11. Tangible Capital Assets (continued)

Year ended December 31, 2021

	Cost			Balance at December 31, 2021	Accumulated Amortization			Balance at December 31, 2021	Net Book Value December 31, 2021
	Balance at December 31, 2020	Additions	Disposals		Balance at December 31, 2020	Disposals	Amortization Expense		
Land									
Sewer and Drainage District	\$ 116,050	\$ 46,822	\$ —	\$ 162,872	\$ —	\$ —	\$ —	\$ —	\$ 162,872
Water District	44,704	8,960	—	53,664	—	—	—	—	53,664
Regional District	889,758	25,869	(1,110)	914,517	—	—	—	—	914,517
Metro Vancouver Housing Corporation	52,274	—	—	52,274	—	—	—	—	52,274
	1,102,786	81,651	(1,110)	1,183,327	—	—	—	—	1,183,327
Infrastructure									
Sewer and Drainage District	1,621,113	547,539	—	2,168,652	676,347	—	31,992	708,339	1,460,313
Water District	2,118,002	127,793	—	2,245,795	402,689	—	34,930	437,619	1,808,176
Regional District	125,581	4,734	(814)	129,501	63,766	(814)	5,182	68,134	61,367
	3,864,696	680,066	(814)	4,543,948	1,142,802	(814)	72,104	1,214,092	3,329,856
Buildings									
Water District	216,476	—	—	216,476	19,225	—	5,463	24,688	191,788
Regional District	26,880	—	—	26,880	9,817	—	540	10,357	16,523
Metro Vancouver Housing Corporation	220,575	(236)	—	220,339	174,053	—	2,491	176,544	43,795
	463,931	(236)	—	463,695	203,095	—	8,494	211,589	252,106
Vehicles									
Regional District	31,093	571	(1,043)	30,621	22,693	(1,043)	2,802	24,452	6,169
	31,093	571	(1,043)	30,621	22,693	(1,043)	2,802	24,452	6,169
Machinery, equipment, furniture & fixtures									
Sewer and Drainage District	8,799	19	—	8,818	7,390	—	485	7,875	943
Water District	13,197	—	—	13,197	6,395	—	1,030	7,425	5,772
Regional District	20,776	499	(106)	21,169	17,561	(106)	973	18,428	2,741
Metro Vancouver Housing Corporation	6,463	480	(504)	6,439	4,720	(504)	527	4,743	1,696
	49,235	998	(610)	49,623	36,066	(610)	3,015	38,471	11,152
Construction in progress									
Sewer and Drainage District	1,707,335	(127,395)	—	1,579,940	—	—	—	—	1,579,940
Water District	717,260	79,201	—	796,461	—	—	—	—	796,461
Regional District	4,938	453	—	5,391	—	—	—	—	5,391
Metro Vancouver Housing Corporation	2,885	5,192	—	8,077	—	—	—	—	8,077
	2,432,418	(42,549)	—	2,389,869	—	—	—	—	2,389,869
	\$7,944,159	\$720,501	\$ (3,577)	\$8,661,083	\$1,404,656	\$ (2,467)	\$ 86,415	\$1,488,604	\$7,172,479
Totals 2021									
Sewer and Drainage District	\$3,453,297	\$466,985	\$ —	\$3,920,282	\$ 683,737	\$ —	\$ 32,477	\$ 716,214	\$3,204,068
Water District	3,109,639	215,954	—	3,325,593	428,309	—	41,423	469,732	2,855,861
Regional District	1,099,026	32,126	(3,073)	1,128,079	113,837	(1,963)	9,497	121,371	1,006,708
Metro Vancouver Housing Corporation	282,197	5,436	(504)	287,129	178,773	(504)	3,018	181,287	105,842
	\$7,944,159	\$720,501	\$ (3,577)	\$8,661,083	\$1,404,656	\$ (2,467)	\$ 86,415	\$1,488,604	\$7,172,479

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 18

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

12. Prepaid Land Leases

	2022	2021
Balance, beginning of year	\$ 5,062	\$ 5,257
Amortization	(194)	(195)
Balance, end of year	\$ 4,868	\$ 5,062

The lease terms for the properties are as follows:

Asset	Lease Expiry Dates	Lease Term (Years)
Buildings		
Habitat Villa	February 2029	50
Walnut Gardens	May 2026	42
Other prepaid land leases	May 2036 to June 2062	60

13. Accumulated Surplus

Accumulated surplus consists of individual fund surplus and reserves as follows:

	2022	2021
Reserves	\$ 441,040	\$ 394,831
Capital fund balance	(93,442)	165,821
Investment in tangible capital assets	5,912,000	5,320,990
Total	\$ 6,259,598	\$ 5,881,642

Capital fund balance represents the future expected level of funding required or accumulated.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 19

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

13. Accumulated Surplus (continued)

The reserves are classified as either operating, discretionary or statutory and are presented in the following schedules:

	December 31, 2021	Interest	Annual Operating Surplus (Deficit)	Transfers	Contributions from (to) Operations	Contributions to Capital	December 31, 2022
Reserve funds							
Operating reserves							
Metro Vancouver Regional District							
Air Quality	\$ 2,098	\$ 51	\$ 1,909	\$ —	\$ —	\$ —	\$ 4,058
E911 Emergency Telephone Service	391	9	74	—	—	—	474
Electoral Area Services	23	1	—	—	—	—	24
General Government	6,118	145	1,585	—	(739)	—	7,109
Housing Planning and Policy	198	5	223	—	—	—	426
Invest Vancouver	21	—	643	—	—	—	664
Regional Employer Services	463	11	333	—	—	—	807
Regional Emergency Management	199	5	61	—	—	—	265
Regional Geospatial Reference System	227	5	172	—	—	—	404
Regional Parks	3,373	64	1,807	—	(1,300)	—	3,944
Regional Planning	866	21	141	—	—	—	1,028
Sasamat Fire Protection Service	105	3	24	—	—	—	132
West Nile Virus	366	9	—	—	—	—	375
MVRD operating reserves	14,448	329	6,972	—	(2,039)	—	19,710
Greater Vancouver Water District							
Water Services	28,602	692	7,954	—	—	—	37,248
GVWD operating reserves	28,602	692	7,954	—	—	—	37,248
Greater Vancouver Sewerage and Drainage District							
Liquid Waste Services	32,955	797	14,021	—	(3,331)	—	44,442
Solid Waste Services	39,213	948	(2,343)	—	—	—	37,818
GVS&DD operating reserves	72,168	1,745	11,678	—	(3,331)	—	82,260
MVHC operating Reserves	2,578	62	10,309	—	—	—	12,949
Total operating reserves	117,796	2,828	36,913	—	(5,370)	—	152,167
Discretionary reserves							
Metro Vancouver Regional District							
Air Quality	1,363	32	—	—	(589)	—	806
Electoral Area Service	1,718	40	45	(130)	(21)	—	1,652
E911 Emergency Telephone Service	601	15	—	—	(584)	—	32
General Government	7,256	175	—	—	—	—	7,431
Invest Vancouver	1,288	31	—	—	(600)	—	719
Regional Emergency Management	338	8	—	—	—	—	346
Regional Employer Services	2,323	56	—	—	—	—	2,379
Regional Planning	2,583	62	—	—	(139)	—	2,506
Regional Parks	203	5	—	—	—	—	208
Centralized Support	24,899	604	2,267	—	(2,037)	—	25,733
MVRD discretionary reserves	42,572	1,028	2,312	(130)	(3,970)	—	41,812
Greater Vancouver Sewerage and Drainage District							
Biosolids Inventory	20,029	484	—	—	(4,704)	—	15,809
Liquid Waste General Debt Reserve Fund	2,123	51	—	—	—	—	2,174
Lions Gate Contingency	1,490	36	—	—	—	—	1,526
Drainage General	5,292	128	—	—	—	—	5,420
Solid Waste General	26,562	436	—	—	—	—	26,998
Landfill Post Closure	11,307	273	—	—	—	—	11,580
GVS&DD discretionary reserves	66,803	1,408	—	—	(4,704)	—	63,507
Metro Vancouver Housing Corporation							
MVHC Capital Development	43,769	1,059	—	—	—	(5,300)	39,528
MVHC Capital Replacement	5,000	13	—	—	(2,414)	—	2,599
MVHC discretionary reserves	48,769	1,072	—	—	(2,414)	(5,300)	42,127
Total discretionary reserves	158,144	3,508	2,312	(130)	(11,088)	(5,300)	147,446
Operating and discretionary reserves (carried forward)	\$ 275,940	\$ 6,336	\$ 39,225	\$ (130)	\$ (16,458)	\$ (5,300)	\$ 299,613

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 20

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

13. Accumulated Surplus (continued)

	December 31, 2021	Interest	Annual Operating Surplus (Deficit)	Transfers	Contributions from (to) Operations	Contributions to Capital	December 31, 2022
Operating and discretionary reserves							
Reserves (brought forward)	\$ 275,940	\$ 6,336	\$ 39,225	\$ (130)	\$ (16,458)	\$ (5,300)	\$ 299,613
Statutory reserves							
Metro Vancouver Regional District							
Electoral Area Community Works	563	17	—	130	38	—	748
Electoral Area Election	60	1	13	—	(60)	—	14
MVRD Sustainability Innovation Fund	12,372	300	—	—	(643)	—	12,029
Grants Reserve Fund	2,158	104	—	—	(150)	—	2,112
Housing Planning and Policy	4,252	116	—	—	1,000	—	5,368
Housing Planning and Policy Development	8,047	247	—	—	4,000	—	12,294
Regional Geospatial Reference System	1,093	26	—	—	45	—	1,164
Regional Parks Infrastructure	6,827	190	—	—	2,468	(3,239)	6,246
Parkland Acquisition	9,488	229	—	—	—	—	9,717
Parkland Acquisition and Development	11,322	454	—	—	19,570	(5,152)	26,194
Delta Airpark	162	4	—	—	(21)	—	145
Regional Parks Legacy	2,666	64	—	—	(50)	—	2,680
Sasamat Fire Protection Services	1,224	35	—	—	339	—	1,598
Corporate Self Insurance	1,188	29	—	—	350	—	1,567
Corporate Fleet	22,424	542	3,239	—	—	(2,135)	24,070
MVRD statutory reserves	83,846	2,358	3,252	130	26,886	(10,526)	105,946
Greater Vancouver Water District							
Laboratory Equipment	785	19	—	—	—	—	804
Water Services Sustainability							
Innovation Fund	14,310	356	—	—	(88)	—	14,578
GVWD statutory reserves	15,095	375	—	—	(88)	—	15,382
Greater Vancouver Sewerage and Drainage District							
Liquid Waste Laboratory Equipment	608	16	—	—	101	—	725
Liquid Waste Services Sustainability							
Innovation Fund	19,341	483	—	—	(450)	—	19,374
GVS&DD statutory reserves	19,949	499	—	—	(349)	—	20,099
Total statutory reserves	118,890	3,232	3,252	130	26,449	(10,526)	141,427
Total reserves	\$ 394,830	\$ 9,568	\$ 42,477	\$ —	\$ 9,991	\$ (15,826)	\$ 441,040

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 21

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

13. Accumulated Surplus (continued)

Investment in tangible capital assets is calculated as follows:

	2022	2021
Tangible capital assets	\$ 7,796,302	\$ 7,172,479
Amount financed by:		
Long-term debt, net of members, TransLink, and sinking fund	(1,884,302)	(1,851,489)
	\$ 5,912,000	\$ 5,320,990
Change in the investment in tangible capital assets		
Acquisition of tangible capital assets	\$ 723,206	\$ 720,501
Amortization of tangible capital assets	(99,142)	(86,415)
Disposal of tangible capital assets (net of book value)	(241)	(1,110)
	623,823	632,976
Less financing (net of members and TransLink debt)		
Sinking fund debt maturity	15,000	10,000
Sinking fund debt retirement	(136,608)	(105,326)
Sinking fund debt retirement income	(27,885)	(25,710)
Debenture debt issued	200,000	600,000
Debenture debt maturity	(15,000)	(10,000)
Payment of long-term debt	(2,694)	(2,920)
	32,813	466,044
Change in investment in tangible capital assets	591,010	166,932
Investment in tangible capital assets, beginning of year	5,320,990	5,154,058
Investment in tangible capital assets, end of year	\$ 5,912,000	\$ 5,320,990

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 22

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

14. Contractual Obligations and Rights

a) Contractual Obligations

- i) As at December 31, 2022, the District had the following commitments relating to projects in progress.

	Authorized and Outstanding Projects	Expended at December 31	Total 2022	Total 2021
GVS&DD	\$ 5,139,887	\$ (2,553,670)	\$ 2,586,217	\$ 1,757,138
GVWD	2,620,217	(1,030,341)	1,589,876	1,429,253
MVRD	45,668	(8,641)	37,027	12,846
MVHC	322,500	(24,106)	298,394	346,323
Total	\$ 8,128,272	\$ (3,616,758)	\$ 4,511,514	\$ 3,545,560

- ii) The District is committed under a number of lease and right-of-way agreements to make minimum annual payments. These agreements have varying terms, including three agreements, with annual payments to perpetuity, with adjustments annually for CPI. Estimated payments over the next ten years are as follows:

	Amount
2023	\$ 2,235
2024	2,268
2025	2,107
2026	2,123
2027	2,156
2028 - 2032	11,309
Total	\$ 22,198

b) Contractual Rights

The District is party to several property lease agreements that are anticipated to provide future revenues. These agreements are with third parties with varying terms to 2035. Amounts anticipated to be received over the future years are as follows:

	Amount
2023	\$ 6,282
2024	5,477
2025	4,400
2026	3,128
2027	1,209
Thereafter	5,474
Total	\$ 25,970

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 23

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

15. Contingencies

Lawsuits

As at December 31, 2022, there were various lawsuits pending against the District arising in the ordinary course of business. The District has retained legal counsel to defend against these lawsuits. Where the outcomes or amounts cannot be reasonably determined, no liability has been recorded. Management is of the opinion that losses, if any, in connection with these lawsuits can be sufficiently funded by reserve funds or covered by insurance. Any expected losses will be accrued and recorded as expenses at the time they are considered likely and amounts are reasonably determinable.

North Shore Wastewater Treatment Plant

The GVS&DD is building a new tertiary wastewater treatment plant on a former industrial site in North Vancouver to replace the primary-only Lions Gate Wastewater Treatment Plant. The deadline for completion of the project under federal regulation was December 31, 2020. In 2021, the GVS&DD served notice to terminate its contract with the vendor hired to design, build and commission the future North Shore Wastewater Treatment Plant, having determined that the vendor was in breach of contract. As of the contract termination date in 2021, the GVS&DD has paid \$309.5 million, net of GST rebates, to the vendor for work completed, which has been recorded as construction in progress (note 11). In 2022, the vendor commenced legal action by filing a claim against the GVS&DD in excess of \$250 million to which the GVS&DD filed a counter-claim against the vendor in excess of \$500 million. In 2022, the GVS&DD also drew on an irrevocable letter of credit in the amount of \$50.0 million as a result of the contract termination. As at December 31, 2022, the outcome of any legal proceedings related to the terminated contract and the potential consequences of not meeting the current deadline under the federal regulation is undeterminable.

Due to the nature of the contractual payments made to date under the terminated contract, the outstanding litigation and uncertainty surrounding the value of the new contract for completion of the project, the amount recorded as work in progress of \$522.6 million (2021 - \$495.7 million) represents management's best estimate. This amount may be subject to material change as new information becomes available.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 24

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

15. Contingencies (continued)

Self-Insurance Reserve

A self-insurance reserve has been established within accumulated surplus to cover losses resulting from uninsured liability exposures of the District.

Each year a review is undertaken to determine if it would be beneficial to purchase additional liability insurance. The District transfers amounts to the reserve depending on the reserve's adequacy to cover retained liability risk.

An estimate is made for all costs of investigating and settlement of claims annually and an adjustment is made to the reserve to maintain an adequate balance to cover potential losses in excess of recorded liabilities. These estimates are changed as additional information becomes known during the course of claims settlement. Any likely losses would be expensed at the time the losses are known and the amounts are reasonably determinable.

Debt Reserve Fund

The MFA is required to establish a Debt Reserve Fund for each debenture which is comprised of cash deposits and a non-interest bearing demand note (refer to note 5). If, at any time, the District has insufficient funds to meet payments due on its obligations to MFA, the payments will be made from the debt reserve fund. The demand notes are callable only if there are additional requirements to be met to maintain the level of the debt reserve fund, and therefore have not been recorded in the statement of financial position.

BCHMC Grant Funding

In 2018 and 2019, MVHC received funding of \$6.7 million in total from BCHMC relating to the re-development of Heather Place property. The conditions of the funding agreement stipulate that the property must be continuously used for the provision of housing for eligible occupants and there is no default under the loan or operating agreement over 35 years. Should a breach in the agreement occur, the outstanding balance of the funding would need to be repaid to BCHMC (\$6.7 million as at December 31, 2022). The contingent liability is reduced by 1/25th annually, commencing in the 11th year of the agreement. Payments of interest will not be required unless there is a default and consequently interest will be payable on the balance of the principal amount outstanding at prime plus 2% per annum, compounded semi-annually and not in advance.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 25

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

15. Contingencies (continued)

BCHMC Loan Funding

In 2022, MVHC entered into a demand non-revolving construction loan agreement with BC Housing Management Commission for funding for the Kingston Gardens re-development project. The maximum approved construction loan amount is \$44,642,752. Amounts drawn from the loan must be repaid no later than August 1, 2024. The BCHMC construction loan is to be repaid by a BCHMC investment of \$8,300,000 and take-out mortgage obtained through CMHC's National Housing Co-Investment Fund for \$29,411,377. Any amounts remaining of up to \$6,931,375, will be paid from MVHC's reserves.

Interest payable on the loan will be calculated based on a variable rate of not more than the Royal Bank of Canada Prime Rate plus 1.00%, compounded monthly, not in advance. As at December 31, 2022, no amounts were drawn from the demand loan.

Letters of Credit

At December 31, 2022, the GVS&DD is the named beneficiary of \$758 thousand (2021 - \$60.37 million) of irrevocable letters of credits from financial institutions related to construction projects and Solid Waste operations. These letters of credit are available under circumstances in which the service provider does not fulfil its obligation to the District and therefore the amount is not recorded as assets.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 26

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

16. Budget Information

The annual budget presented in these financial statements is based upon the 2022 operating and capital budgets originally approved by the District's Board in October 2021, with additional approval in November 2022 for adjustments to the budget as a result of the 2021 fiscal year end results. The budget is based on operational and capital expenditure requirements and their associated funding. Amortization is a non-cash item that is not funded for budget purposes. Also, contributions to or from reserves and debt principal repayments are removed from the approved budget for financial statement presentation. The schedule below reconciles the approved budget to the budget figures reported in these financial statements. Capital expenditures of \$1.39 billion were included in the capital budget approved by the Board.

	2022 Budget	2021 Budget
Budgeted annual surplus per Exhibit B - Statement of	\$ 451,760	\$ 580,551
Additional transfers from reserves, approved by Board	3,634	1,575
Adjusted annual surplus, based on originally approved budget	455,394	582,126
Items not included in the operating budget		
Amortization of tangible capital assets	96,267	86,428
Contributions from deferred revenue	(110,665)	(251,932)
Sinking fund and debt retirement income	(25,566)	(23,044)
Development cost charge revenue	(42,329)	(45,000)
MVHC development grant	(17,536)	(8,500)
Reserve interest	(6,592)	(6,079)
Items included in budget but not in financial statements		
Sinking fund and debt retirement payments	(140,561)	(108,890)
Transfers to capital fund	(203,053)	(205,371)
Transfers from reserve funds	30,865	14,940
Transfer to reserve funds	(36,224)	(34,678)
Annual surplus per approved budget	—	—

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 27

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

17. Segmented Information and Expenses by Object

The District is a diversified municipal government organization that provides a wide range of services directly to the public and its member municipalities through its four legal entities: the MVRD, the GVS&DD, the GVWD, and the MVHC. For management reporting purposes, the District's operations and activities are organized and reported by service areas within the legal entities.

The salaries and benefits reported in the segmented information below do not include \$31.47 million (2021 - \$32.88 million) directly attributable to the construction of tangible capital assets which have been capitalized and included in tangible capital assets in the Statement of Financial Position.

The legal entities disclosed in the segmented information, along with the service areas provided are as follows:

GVS&DD

Liquid Waste Services

The Liquid Waste Management Service is responsible for the collection, treatment and discharge of liquid waste for member municipalities. It operates a number of wastewater treatment plants and a related collection network connected to the member municipalities' systems.

Solid Waste Services

The Solid Waste Management Service is responsible for the disposal of solid waste both for the member municipalities and the public. It owns and operates several solid waste facilities including a waste-to-energy facility.

GVWD

Water Operations

Water Operations is responsible for the supply of potable water to its member municipalities. It owns a series of dams, reservoirs, water treatment plants and a distribution network connected to the member municipalities' systems.

Building Operations

Building Operations is responsible for operating and maintaining office buildings owned by GVWD. These facilities are leased to MVRD and its related legal entities for its head office operations as well as to external parties.

MVHC

Metro Vancouver Housing Corporation is a wholly-owned subsidiary of MVRD, which owns and operates housing sites within the Lower Mainland for the purpose of providing affordable rental housing on a non-profit basis through various housing programs, some federally and some provincially funded. MVHC's portfolio consists of "rent-geared-to-income", partial rent assistance, and low-end-of-market units.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 28

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

17. Segmented Information and Expenses by Object (continued)

MVRD

<i>Regional Parks</i>	Regional Parks is responsible for managing, maintaining, and protecting a diverse network of Regional Parks and an expanding land base of reserves, ecological conservancy areas, and greenways, located throughout the Region.
<i>General Government</i>	General Government includes services responsible for overall direction and monitoring and regional initiatives. This area comprises the Regional Board & Committee Remuneration, Corporate Secretary's Office, Audit, Legal and Insurance costs, Innovation, Regional Emergency Management, Regional Cultural Strategy and External Contributions and Zero Waste Collaborative Initiatives.
<i>Air Quality</i>	Air Quality is responsible for monitoring air quality in the region, controlling industrial, commercial and some residential emissions, creating long-term plans, and conducting emission inventories.
<i>Regional Employee Services</i>	Regional Employee Services provides collective bargaining, job evaluation, research, and other related labour relations services to those MVRD municipalities who are members of the function.
<i>E911 Emergency Telephone Service</i>	The District contracts with E-Comm Corporation to provide 911 service for all municipalities within the region as well as the community of Whistler and the Sunshine Coast Regional District.
<i>Regional Planning</i>	Regional Planning's core responsibilities are focused on regional growth management, utility management and air quality management. Primary activities include development and implementation of a wide range of innovative policies and plans, extensive research, modeling and technical analysis, regulation, business demand management and community education.
<i>Invest Vancouver</i>	Invest Vancouver fosters regional and cross-sectoral collaboration on economic development issues, advises leaders on economic policy and strategy, promotes the region to a global audience, and attracts strategic investment.
<i>Housing Planning and Policy</i>	Housing Planning and Policy contributes to processes and decisions related to the development of affordable housing projects, and in particular to the redevelopment of the MVHC portfolio of mixed-income housing complexes and the development of vacant lands owned by local government (including the MVRD).

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 29

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

17. Segmented Information and Expenses by Object (continued)

MVRD (continued)

<i>Electoral Areas</i>	The District is responsible for providing general and local services to one unincorporated area (Electoral Area A) of the regional district. General services provided include a variety of tax-supported, regional services such as 911 emergency telephone, air quality, labour relations, regional parks, strategic planning, and general government.
<i>Regional Global Positioning System</i>	The District's Global Positioning System (GPS) Real-Time Service is offered to member municipalities and to the public in partnership with the B.C. Crown Registry and Geographic Base (CRGB) Branch.
<i>Sasamat Volunteer Fire Department</i>	The Sasamat Volunteer Fire Department provides volunteer fire department services to the Villages of Anmore and Belcarra. The cost to support this function is borne completely by the members who receive the service.
<i>Regional Emergency Management</i>	Regional Emergency Management is an intergovernmental partnership between the Province of British Columbia and the District to coordinate regional emergency management planning activities and to engage all levels of government and private sector agencies in regional emergency planning initiatives for the Metro Vancouver region.
<i>Corporate Programs</i>	Corporate programs provide centralized support for Metro Vancouver's four legal entities, including financial services, human resources, external relations, legislative service, indigenous relations, project delivery, self-insurance, and information technology.
<i>Members and Translink Sinking Fund Income</i>	The District serves as the borrowing conduit between member municipalities (excluding City of Vancouver) and Translink and the MFA. (Note 10). Sinking fund income earned on debenture issues held on behalf of members and Translink is recorded as revenue earned on the sinking fund with the offsetting expenditure owing to these organizations.

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 30

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

17. Segmented Information and Expenses by Object (continued)

a) Total Consolidated

	Other Districts (note 17(b))	Regional District (note 17(c))	Metro Vancouver Housing Corporation	Inter-district Adjustments	Consolidated Actual 2022	Consolidated Budget 2022	Consolidated Actual 2021
Revenues							
MVRD property tax requisitions	\$ —	\$ 91,708	\$ —	\$ —	\$ 91,708	\$ 91,708	\$ 82,714
Metered sale of water	329,678	—	—	—	329,678	329,366	319,989
Sewerage and drainage levy	301,425	—	—	—	301,425	301,425	288,226
Tipping fees	125,797	—	—	—	125,797	112,910	112,610
Housing property rentals	—	—	43,267	—	43,267	42,051	42,416
BODTSS industrial charges	12,431	—	—	—	12,431	12,263	12,157
Development cost charges	60,583	—	—	—	60,583	103,080	42,204
Grants and other contributions	29,870	3,965	3,430	—	37,265	126,822	76,174
User fees, recoveries, and other revenues	46,219	12,651	1,176	(13,635)	46,411	41,175	42,903
Gain on disposal of tangible capital assets	—	—	—	—	—	—	—
Sinking fund and interest income	33,247	4,098	1,448	(111)	38,682	32,110	32,840
Sinking fund income members and TransLink	—	27,072	—	—	27,072	29,165	28,222
	939,250	139,494	49,321	(13,746)	1,114,319	1,222,075	1,080,455
Expenses							
Salaries and benefits	117,428	105,711	6,661	(15,831)	213,969	221,673	191,444
Consulting, contracted and professional services	160,078	21,905	995	(60)	182,918	192,812	146,256
Asset repairs and maintenance	21,113	10,447	14,597	—	46,157	63,390	43,061
Materials and supplies	31,610	5,421	205	—	37,236	38,139	33,732
Utilities, permits, and taxes	25,839	1,904	4,601	(3)	32,341	34,381	30,552
Other	34,195	40,885	912	(18,528)	57,464	51,016	53,049
Amortization of tangible capital assets and prepaid land leases	87,996	8,369	2,971	—	99,336	96,267	86,610
Interest on long-term debt	65,758	—	1,295	(111)	66,942	72,637	60,693
	544,017	194,642	32,237	(34,533)	736,363	770,315	645,397
Corporate costs (recovery)	67,762	(90,939)	2,390	20,787	—	—	—
	611,779	103,703	34,627	(13,746)	736,363	770,315	645,397
Annual Surplus (deficit)	\$ 327,471	\$ 35,791	\$ 14,694	\$ —	\$ 377,956	\$ 451,760	\$ 435,058

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 31

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

17. Segmented Information and Expenses by Object (continued)

b) Total Other Districts

	Liquid Waste Services	Solid Waste Service	Total Sewerage & Drainage District	Water Operations	Building Operations	Elimination Entry	Total Water District	Total Other Districts Actual 2022	Total Other Districts Budget 2022	Total Other Districts Actual 2021
Revenues										
Metered sale of water	\$ —	\$ —	\$ —	\$ 329,678	\$ —	\$ —	\$ 329,678	\$ 329,678	\$ 329,366	\$ 319,989
Sewerage and drainage levy	301,425	—	301,425	—	—	—	—	301,425	301,425	288,226
Tipping fees	—	125,797	125,797	—	—	—	—	125,797	112,910	112,610
BODTSS industrial charges	12,431	—	12,431	—	—	—	—	12,431	12,263	12,157
Development cost charges	60,583	—	60,583	—	—	—	—	60,583	103,080	42,204
Grants and other contributions	29,870	—	29,870	—	—	—	—	29,870	106,415	61,062
User fees, recoveries, and other revenues	6,589	14,201	20,790	10,161	21,114	(5,846)	25,429	46,219	36,657	42,158
Gain on disposal of tangible capital assets	—	—	—	—	—	—	—	—	—	—
Sinking fund and interest income	8,439	1,969	10,408	20,745	2,094	—	22,839	33,247	28,861	27,945
	419,337	141,967	561,304	360,584	23,208	(5,846)	377,946	939,250	1,030,977	906,351
Expenses										
Salaries and benefits	65,694	6,517	72,211	44,723	494	—	45,217	117,428	125,242	110,365
Consulting, contracted, and professional services	42,471	102,396	144,867	13,308	1,903	—	15,211	160,078	154,610	124,964
Asset repairs and maintenance	13,981	860	14,841	3,955	2,317	—	6,272	21,113	22,379	18,990
Materials and supplies	18,018	45	18,063	13,493	54	—	13,547	31,610	32,995	27,788
Utilities, permits, and taxes	16,829	469	17,298	7,635	906	—	8,541	25,839	27,548	24,691
Other	9,179	16,723	25,902	7,560	733	—	8,293	34,195	26,303	26,450
Amortization of tangible capital assets	36,787	8,382	45,169	37,891	4,936	—	42,827	87,996	85,030	73,900
Interest on long-term debt	32,135	2,424	34,559	26,453	4,746	—	31,199	65,758	71,224	59,548
	235,094	137,816	372,910	155,018	16,089	—	171,107	544,017	545,331	466,696
Corporate costs (recovery)	39,066	5,114	44,180	29,428	—	(5,846)	23,582	67,762	77,844	59,301
	274,160	142,930	417,090	184,446	16,089	(5,846)	194,689	611,779	623,175	525,997
Annual surplus (deficit)	\$ 145,177	\$ (963)	\$ 144,214	\$ 176,138	\$ 7,119	\$ —	\$ 183,257	\$ 327,471	\$ 407,802	\$ 380,354

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 32

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

17. Segmented Information and Expenses by Object (continued)

c) Total Regional District

	Regional Parks	General Government	Air Quality	Regional Employees Services	E911 Emergency Telephone Service	Regional Planning	Invest Vancouver	Housing Planning and Policy	Regional Sub-total 2022
Revenues									
MVRD property tax requisitions	\$ 57,063	\$ 6,441	\$ 7,392	\$ 2,548	\$ 4,670	\$ 3,923	\$ 2,185	\$ 6,254	\$ 90,476
Grants and other contributions	1,006	1,406	250	—	—	—	178	—	2,840
User fees, recoveries, and other revenues	2,808	720	4,464	148	86	—	—	—	8,226
Gain (loss) on disposal of tangible capital assets	—	—	—	—	—	—	—	—	—
Sinking fund and interest income	1,011	(165)	83	67	24	83	32	368	1,503
Sinking fund income, members and TransLink	—	—	—	—	—	—	—	—	—
	61,888	8,402	12,189	2,763	4,780	4,006	2,395	6,622	103,045
Expenses									
Salaries and benefits	19,759	3,382	7,071	2,262	—	3,060	1,726	811	38,071
Consulting, contracted and professional services	4,204	1,119	1,326	64	5,152	623	85	110	12,683
Asset repairs and maintenance	3,335	94	74	1	—	13	2	—	3,519
Materials and supplies	985	23	249	4	—	7	9	1	1,278
Utilities, permits, and taxes	781	3	100	8	22	1	7	—	922
Other	3,408	1,651	1,047	66	—	113	455	21	6,761
Amortization of tangible capital assets	1,829	—	249	—	2	—	—	—	2,080
	34,301	6,272	10,116	2,405	5,176	3,817	2,284	943	65,314
Corporate costs (recovery)	4,104	895	985	(43)	93	323	136	88	6,581
	38,405	7,167	11,101	2,362	5,269	4,140	2,420	1,031	71,895
Annual surplus (deficit)	\$ 23,483	\$ 1,235	\$ 1,088	\$ 401	\$ (489)	\$ (134)	\$ (25)	\$ 5,591	\$ 31,150

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 33

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

17. Segmented Information and Expenses by Object (continued)

c) Total Regional District (continued)

	Carried Forward	Electoral Areas	Regional Global Positioning System	Sasamat Volunteer Fire Department	Regional Emergency Management	Corporate Programs	Members and TransLink, Sinking Fund Income	Regional Districts Actual 2022	Regional Districts Budget 2022	Regional Districts Actual 2021
Revenues										
MVRD property tax requisitions	\$ 90,476	\$ 401	\$ —	\$ 658	\$ 173	\$ —	\$ —	\$ 91,708	\$ 91,708	\$ 82,714
Grants and other contributions	2,840	213	—	—	—	912	—	3,965	1,037	13,241
User fees, recoveries, and other revenues	8,226	55	386	25	26	3,933	—	12,651	17,373	9,194
Gain (loss) on disposal of tangible capital assets	—	—	—	—	—	—	—	—	—	367
Sinking fund and interest income	1,503	58	32	38	13	2,454	—	4,098	2,288	4,360
Sinking fund income, members and TransLink	—	—	—	—	—	—	27,072	27,072	29,165	28,222
	103,045	727	418	721	212	7,299	27,072	139,494	141,571	138,098
Expenses										
Salaries and benefits	38,071	379	130	46	—	67,085	—	105,711	115,868	91,331
Consulting, contracted and professional services	12,683	17	—	41	127	9,037	—	21,905	38,594	20,660
Asset repairs and maintenance	3,519	2	—	66	—	6,860	—	10,447	22,960	7,204
Materials and supplies	1,278	5	1	23	—	4,114	—	5,421	4,958	5,775
Utilities, permits, and taxes	922	3	11	20	—	948	—	1,904	2,333	1,406
Other	6,761	208	1	96	1	6,746	27,072	40,885	43,079	40,031
Amortization of tangible capital assets	2,080	—	—	30	32	6,227	—	8,369	8,334	9,497
	65,314	614	143	322	160	101,017	27,072	194,642	236,126	175,904
Corporate costs (recovery)	6,581	40	26	28	11	(97,625)	—	(90,939)	(111,344)	(81,050)
	71,895	654	169	350	171	3,392	27,072	103,703	124,782	94,854
Annual surplus (deficit)	\$ 31,150	\$ 73	\$ 249	\$ 371	\$ 41	\$ 3,907	\$ —	\$ 35,791	\$ 16,789	\$ 43,244

METRO VANCOUVER REGIONAL DISTRICT

Notes to Consolidated Financial Statements, page 34

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

18. Subsequent Events

- a) On March 23, 2023, the District received \$50.78 million as part of the Province of British Columbia's Growing Community Funds Program, to be applied to infrastructure projects in 2023.
- b) On March 28, 2023, the GVS&DD entered into a three-year contribution agreement with the Province of British Columbia, where the Province will provide \$250 million, one-third of the funding, for Phase 1 Iona Wastewater Treatment Plant. The GVS&DD will receive \$75 million in April 2023 and in April 2024, and the remaining \$100 million in April 2025.
- c) On April 12, 2023, the MVHC entered into a three-year memorandum of understanding with the Province of British Columbia, through the BCHMC, to provide \$158 million in funding to the MVHC over the next three years for the construction of approximately 660 new homes at five of the MVHC sites.

19. Comparative Figures

Certain prior year figures have been reclassified to conform to the presentation of the current year.

METRO VANCOUVER REGIONAL DISTRICT

Schedule 1 (unaudited)

Year ended December 31, 2022

(tabular amounts in thousands of dollars)

COVID-19 Restart Grant (unaudited)

The Province of British Columbia, under the “COVID-19 Safe Restart Grant Program”, provided the District with a grant of \$1.476 million in 2021 (\$nil in 2022) for increased operating costs arising during the pandemic. The District recognized the grant into income and applied these funds to the programs impacted as follows:

	2022	2021
Balance, beginning of the year	\$ 739	\$ 588
BC Restart Grant received	—	1,476
	739	2,064
Less Eligible Costs Incurred:		
Computer and Technology costs	—	226
External Relations	—	300
Head Office Building Operations	149	271
Liquid Waste Services	—	288
Cultural Grants	140	150
Regional Parks Services	—	32
Water Services	—	58
Metro Vancouver Housing Corporation	450	—
	739	1,325
Balance, end of year	\$ —	\$ 739

Financial Statements of

**GREATER VANCOUVER SEWERAGE
AND DRAINAGE DISTRICT**

Year ended December 31, 2022

DRAFT - APRIL 3, 2023

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Index to Financial Statements

December 31, 2022

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Statement of Financial Position	A
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Statement of Change in Net Debt	C
Statement of Cash Flows	D
Notes to Financial Statements	

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

MANAGEMENT REPORT

The Financial Statements contained in this report have been prepared by management in accordance with Canadian public sector accounting standards. The integrity and objectivity of these statements are management's responsibility. Management is responsible for all the statements and schedules, and for ensuring that this information is consistent, where appropriate, with the information contained in the financial statements.

Management is also responsible for implementing and maintaining a system of internal controls to provide reasonable assurance that reliable financial information is produced.

The Greater Vancouver Sewerage and Drainage District's Board of Directors is responsible for approving the financial statements and for ensuring that management fulfills its responsibilities for financial reporting and internal control and exercises this responsibility through the Finance Committee of the Board.

The external auditors, BDO Canada LLP, conduct an independent examination, in accordance with Canadian generally accepted auditing Standards, and express their opinion on the financial statements. Their examination does not relate to the other schedules and statements required by the *Financial Information Act*. The Independent Auditor's Report outlines the scope of the audit for the year ended December 31, 2022.

On behalf of Greater Vancouver Sewerage and Drainage District.

Dean Rear, Chief Financial Officer

Date: April 28, 2023

Independent Auditor's Report

To the Board of Directors of the Greater Vancouver Water District

Opinion

We have audited the financial statements of the Greater Vancouver Water District (the "District"), which comprise the Statement of Financial Position as at December 31, 2022, and the Statements of Operations, Change in Net Debt and Cash Flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the District as at December 31, 2022, and the results of its operations, change in net debt and cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the District in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the District's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the District or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the District's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the District's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the District to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Chartered Professional Accountants

Vancouver, British Columbia
REPORT DATE

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Exhibit A

Statement of Financial Position

As at December 31, 2022

	2022	2021
Financial Assets		
Cash	\$ 157,253	\$ -
Accounts receivable	108,082,942	139,016,130
Due from Metro Vancouver Regional District	489,761,788	630,865,561
Debt reserve fund (note 2)	15,494,573	13,562,273
	613,496,556	783,443,964
Liabilities		
Accounts payable and accrued liabilities (note 3)	166,828,783	228,313,571
Landfill closure and post-closure liability (note 4)	41,025,735	32,906,686
Deferred revenue and refundable deposits (note 5)	330,473,282	329,169,804
Debt (net of sinking funds) (note 6)	1,178,144,091	1,094,984,832
	1,716,471,891	1,685,374,893
Net Debt	(1,102,975,335)	(901,930,929)
Non-Financial Assets		
Tangible capital assets (note 7)	3,548,808,341	3,204,067,696
Inventories of supplies	7,061,586	6,582,165
Prepaid expenses	3,871,838	2,428,408
	3,559,741,765	3,213,078,269
Accumulated surplus (note 8)	\$2,456,766,430	\$2,311,147,340

Contractual obligations and rights (note 9)

Contingencies (note 10)

Budget information (note 11)

Segmented information and expenses by object (note 12)

Subsequent event (note 13)

The accompanying notes are an integral part of these financial statements.

Chief Financial Officer

Board Chair

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Exhibit B

Statement of Operations

Year ended December 31, 2022

	2022 Budget (note 11)	2022 Actual	2021 Actual
Revenue (note 12)			
Sewerage and drainage levy	\$ 301,424,687	\$ 301,424,687	\$ 288,225,540
Tipping fees	112,909,870	125,797,098	112,609,847
BODTSS Industrial Charges	12,262,636	12,431,402	12,157,191
Development cost charges (note 5)	103,080,328	60,582,644	42,204,285
User fees, recoveries and other	19,116,187	20,789,665	15,246,793
Sinking fund, debt retirement and interest income	9,818,623	10,408,465	6,579,921
Grants and other contributions (note 5)	106,415,000	29,870,139	61,062,379
	665,027,331	561,304,100	538,085,956
Expenses (note 12)			
Liquid waste services	288,265,504	272,755,299	232,019,605
Solid waste services	119,452,219	142,929,711	107,977,251
	407,717,723	415,685,010	339,996,856
Annual surplus	257,309,608	145,619,090	198,089,100
Accumulated surplus, beginning of year	2,311,147,340	2,311,147,340	2,113,058,240
Accumulated surplus, end of year	\$ 2,568,456,948	\$ 2,456,766,430	\$ 2,311,147,340

The accompanying notes are an integral part of these financial statements.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Exhibit C

Statement of Change in Net Debt

Year ended December 31, 2022

	2022 Budget (note 11)	2022 Actual	2021 Actual
Annual surplus	\$ 257,309,608	\$ 145,619,090	\$ 198,089,100
Change in tangible capital assets:			
Acquisition of tangible capital assets	(831,292,000)	(390,013,721)	(466,984,864)
Amortization of tangible capital assets	43,785,108	45,168,958	32,477,244
Net book value of tangible capital assets disposed	-	104,118	-
	(787,506,892)	(344,740,645)	(434,507,620)
Change in other non-financial assets:			
Acquisition of prepaid expenses	-	(3,871,838)	(2,428,408)
Use of prepaid expenses	-	2,428,408	3,069,828
Acquisition of inventories of supplies	-	(7,061,586)	(6,582,165)
Consumption of inventories of supplies	-	6,582,165	5,704,961
	-	(1,922,851)	(235,784)
Changes in net debt	(530,197,284)	(201,044,406)	(236,654,304)
Net debt, beginning of year	(901,930,929)	(901,930,929)	(665,276,625)
Net debt, end of year	\$ (1,432,128,213)	\$ (1,102,975,335)	\$ (901,930,929)

The accompanying notes are an integral part of these financial statements.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Exhibit D

Statement of Cash Flows

Year ended December 31, 2022

	2022	2021
Cash provided by (used in):		
Operating transactions:		
Annual surplus	\$ 145,619,090	\$ 198,089,100
Items not involving cash:		
Amortization	45,168,958	32,477,244
Sinking fund income	(6,422,245)	(5,014,043)
Debt reserve fund income	(332,300)	(206,272)
Gain on disposal of tangible capital assets	(1,346,378)	-
Change in landfill closure and post-closure liability	8,119,049	742,912
Change in non-cash assets and liabilities:		
Accounts receivable	30,933,188	(53,557,937)
Prepaid expenses	(1,443,430)	641,420
Accounts payable and accrued liabilities	(61,484,788)	72,536,039
Deferred revenue	1,303,478	26,384,517
Inventories of supplies	(479,421)	(877,204)
Net change in cash from operating transactions	159,635,201	271,215,776
Capital transactions:		
Proceeds on sale of tangible capital assets	1,450,496	-
Acquisition of tangible capital assets	(390,013,721)	(466,984,864)
Net change in cash from capital transactions	(388,563,225)	(466,984,864)
Financing transactions:		
Due from Metro Vancouver Regional District	141,103,773	(121,238,995)
Debenture debt issued	160,000,000	370,000,000
Debt reserve fund issuance	(1,600,000)	(3,700,000)
Debt reserve fund maturity	-	155,756
Sinking fund payments	(70,418,496)	(49,447,673)
Debenture debt maturity	-	(10,000,000)
Sinking fund retirement	-	10,000,000
Net change in cash from financing transactions	229,085,277	195,769,088
Net change in cash and cash equivalents	157,253	-
Cash and cash equivalents, beginning of year	-	-
Cash and cash equivalents, end of year	\$ 157,253	\$ -

The accompanying notes are an integral part of these financial statements.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 1
Year ended December 31, 2022

1. Significant Accounting Policies

The Greater Vancouver Sewerage and Drainage District (the “District”) was established by an Act of the same name in 1956. Its two primary responsibilities are the collection, treatment, and discharge of liquid waste for the municipalities of the Metro Vancouver Regional District (“MVRD”), and the disposal of solid waste both for the municipalities of the MVRD and the public.

The District owns and operates a number of wastewater treatment plants and a related collection network connected to the municipal collection systems, and several solid waste facilities including a waste-to-energy facility. Its Board of Directors comprises the same councilors and mayors as appointed to the MVRD Board by the participating municipalities. The member municipalities under the Act are jointly and severally liable for its debts.

The District’s financial statements are prepared by management in accordance with Canadian public sector accounting standards. Significant accounting policies adopted by the District are as follows:

Basis of Accounting

The District follows the accrual method of accounting for revenues and expenses. Revenues are recognized in the year in which they are earned and measurable. Expenses are recognized as they are incurred and measurable as a result of receipt of goods or services and/or the legal obligation to pay.

Government Transfers

Government transfers are recognized as revenue in the financial statements when the transfer is authorized and any eligibility criteria are met, except to the extent that transfer stipulations give rise to an obligation that meets the definition of a liability. The transfer of revenue is initially deferred and then recognized in the statement of operations as the stipulation liabilities are settled.

When the District is deemed the transferor, the transfer expense is recognized when the recipient is authorized and has met the eligibility criteria.

Deferred Revenue and Refundable Deposits

Deferred revenue represents development cost charges and a Provincial grant which have been collected, but for which the related services or obligations have yet to be performed. These amounts will be recognized as revenue in the fiscal year the services are performed or obligations and stipulations have been met.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 2

Year ended December 31, 2022

1. Significant Accounting Policies (continued)

Sinking Fund, Debt Retirement, and Interest Income

Interest income is reported as revenue in the period earned. When required, based on external restrictions, interest income earned on deferred revenue is added to and forms part of the deferred revenue balance, and is recognized into income when related stipulations are met. Any surpluses received from upon debt retirement are recorded in the year received.

Cash and Investments

In order to improve cash management, the MVRD holds cash and investment transactions in pooled accounts on behalf of its four legal entities: the Metro Vancouver Regional District, the Greater Vancouver Sewerage and Drainage District, the Greater Vancouver Water District, and the Metro Vancouver Housing Corporation. The District's main cash is therefore presented as due from MVRD. Investments held by the MVRD consist of bonds issued by governments and Canadian chartered banks, money market instruments, guaranteed investment certificates, and term deposits. Interest earned on the District's fund balances is included in the amount owing from MVRD and is recorded as interest income in the Statement of Operations.

Employee Future Benefits

Employees who provide services for the District are employees of the MVRD. Employee related costs are allocated by the MVRD to the District based on services rendered. These costs are shown as expenses in the financial statements and are included in amounts owing from MVRD.

Post-employment benefits of the MVRD, including accumulated banked sick and vacation pay, retirement severance, and Worker's Compensation top-up benefits for employees pursuant to certain policies and union agreements, are actuarially determined based on service and best estimates of retirement ages and expected future salary and wage increases. The obligation under these benefit plans is allocated to the District based on projected benefits as the employees render services necessary to earn the future benefits and included in amounts owing to MVRD.

Landfill Closure and Post-Closure Liability

The estimated present value of landfill closure and post-closure costs is recognized as a liability. This liability is recognized based on estimated future expenses, including estimated inflation discounted to the current date and accrued based on the proportion of the total capacity of the landfill used as of the date of the statement of financial position. The change in this estimated liability during the year is recorded as an expense in operations. These estimates are reviewed and adjusted annually and any changes are recorded on a prospective basis.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 3
Year ended December 31, 2022

1. Significant Accounting Policies (continued)

Non-Financial Assets

Non-financial assets are not available to discharge existing liabilities and are held for use in the provision of services. They generally have useful lives extending beyond the current year and are not intended for sale in the ordinary course of operations.

Tangible Capital Assets

Tangible capital assets are recorded at cost which includes amounts that are directly attributable to acquisition, construction, development, or betterment of the asset. The cost, less residual value, of the tangible capital assets, except land, is amortized over their estimated useful lives. All assets are amortized on a straight line basis as follows:

Asset	Useful Life – Years
Infrastructure	
Interceptors and trunk sewers, drainage	100
Wastewater treatment and pumping stations	50
Solid waste incinerators and transfer stations	30
Solid waste landfills	25 - 30
Information technology systems and networks	5
Machinery, Equipment, Furniture, and Fixtures	5 - 20

- a. Annual amortization:
Annual amortization begins when the asset is available for use and is expensed over its useful life. Assets under construction are transferred to the appropriate asset class and are amortized from the date the asset is available for use.
- b. Contributions of tangible capital assets:
Contributions of tangible capital assets are recorded at their estimated fair value at the date of receipt and as contribution revenue.
- c. Interest capitalization:
The District does not capitalize interest costs associated with the acquisition or construction of a tangible capital asset.

Inventories of Supplies

Inventories of supplies held for consumption are recorded on a first-in-first-out basis.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 4
Year ended December 31, 2022

1. Significant Accounting Policies (continued)

Revenue Recognition	Tipping fees, levies, electricity sales, permits, user fees, and other revenue are recognized as revenue on an accrual basis according to the usage and rates approved and set by the Board in various fees and charges bylaws.
Segmented Information	A segment is defined as a distinguishable activity or group of activities of a government for which it is appropriate to separately report financial information to achieve the objectives of the standard. Definitions of the District's segments and their related financial information are presented in note 12.
Liability for Contaminated Sites	A liability for remediation of a contaminated site is recognized when the site is no longer in productive use and the following criteria are satisfied: an environmental standard exists; contamination exceeds the standard; the District is either directly responsible or has accepted responsibility for remediation; it is expected that future economic benefits will be given up and a reasonable estimate of the liability can be made. Liabilities for contaminated sites are reported in accounts payable and accrued liabilities (note 3).
Use of Estimates	<p>The preparation of these financial statements requires management to make estimates and assumptions that affect the reported amounts in the financial statements and the disclosure of contingent liabilities. These estimates and assumptions are based on management's best information and judgment and may differ from actual results. Adjustments, if any, will be reflected in the financial statements in the period that the change in estimate is made, as well as in the period of settlement if the amount is different.</p> <p>Significant areas requiring the use of management's judgment relate to the determination of landfill closure and post closure liability, contaminated sites liabilities, the estimate of accruals for projects in progress, amortization rates and useful lives of tangible capital assets, the assessment of the impairment of tangible capital assets and work in progress, and the assessment of the outcome of contingent liabilities.</p>

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 5

Year ended December 31, 2022

2. Debt Reserve Fund

The Municipal Finance Authority of British Columbia ("MFA") provides financing for regional districts and member municipalities. The MFA is required to establish a Debt Reserve Fund for each debenture issue equal to one-half the average annual installment of principal and interest. The debt reserve fund is comprised of cash deposits equal to 1% of the principal amount borrowed and a non-interest bearing demand note for the remaining requirement. Cash deposits held by the MFA are payable with interest to the ultimate borrower when the final obligations under the respective loan agreements have been made.

If, at any time, the District has insufficient funds to meet payments due on its obligations to the MFA, the payments will be made from the debt reserve fund. The demand notes are callable only if there are additional requirements to be met to maintain the level of the debt reserve fund. At December 31, 2022, \$45,042,860 (2021 - \$39,493,543) in callable demand notes were outstanding and have not been recorded in the statement of financial position.

3. Accounts Payable and Accrued Liabilities

	2022	2021
Trade accounts	\$ 117,438,953	\$ 182,682,467
Construction holdbacks	41,729,494	38,907,540
Accrued interest on debt	7,660,336	6,423,564
Contaminated Sites (a)	—	300,000
	\$ 166,828,783	\$ 228,313,571

(a) The District accrued \$300,000 in 2021 for work to be undertaken to remediate contaminated soils for one property. As at December 31 2022, there is no work remaining to be completed.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 6

Year ended December 31, 2022

4. Landfill Closure and Post-Closure Liability

The District is responsible for its share of closure and post-closure costs at landfill sites as detailed below.

- a) The Vancouver landfill is located in Delta, BC. In accordance with an agreement with the City of Vancouver, the District is responsible for its proportionate share of the closure and post-closure liability based on usage. The present value of the District's estimated future liability for these expenses is recognized as the landfill site's capacity is used and is as follows:

	2022	2021
Landfill closure and post closure liability	\$ 41,025,735	\$ 32,906,686

The closure and post-closure liability and annual expense is calculated based on the ratio of actual utilization to total expected utilization of the site's capacity at the date of closure. It is based on estimates and assumptions with respect to events extending over the remaining life of the Vancouver landfill, including provisions contained in Metro Vancouver's Integrated Solid Waste and Resource Management Plan. The significant estimates and assumptions adopted in measuring the District's share of the closure and post-closure liability are as follows:

	2022	2021
Current actual utilization (in tonnes)	23,195,905	22,521,439
Expected utilization at closure (in tonnes)	28,299,639	28,219,409
Expected remaining capacity (in tonnes)	5,103,734	5,697,970
Permitted capacity (in tonnes)	33,039,183	33,039,183
Future costs	\$ 212,638,152	\$ 197,188,990
Present value of future costs	\$ 136,568,950	\$ 115,933,724
Proportionate share of liability	36.65%	35.57%
Utilization of total capacity, end of year	81.97%	79.81%
Discount rate	2.58%	2.73%
Expected post-closure period	30 years	30 years
Expected closure date	December 31, 2037	December 31, 2037

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 7

Year ended December 31, 2022

4. Landfill Closure and Post-Closure Liability (continued)

- b) The Cache Creek landfill is located in the Village of Cache Creek, BC. The landfill permit obligates the Village of Cache Creek and a third party service provider to undertake closure and post-closure activities. The District, in accordance with an agreement with the Village, was required to contribute quarterly to a trust fund, held with the Province of British Columbia, to a Post Closure Maintenance and Repair Fund at rates consistent with the operational certificate for the landfill. The agreement indemnifies the Village for any post closure liabilities not covered by this fund. At December 31, 2022, the lower of amortized book value and market value of the trust was \$15,403,059 (2021 - \$16,261,510), which approximates the post-closure liability.

The Cache Creek landfill was closed December 2016. The actual utilization at closure was 10,318,780 tonnes and the permitted capacity was 10,371,594 tonnes. The post-closure period is expected to be 30 years. The present value of District's estimated future post-closure liability is sufficiently funded by the trust.

5. Deferred Revenue and Refundable Deposits

Deferred revenue consists of the following:

	2022	2021
Development cost charges (a)	\$ 273,595,957	\$ 258,633,516
Provincial grant to fund capital expenditures (b)	55,358,323	69,074,393
Refundable deposits	1,519,002	1,461,895
Total	\$ 330,473,282	\$ 329,169,804

- a) The *Greater Vancouver Sewerage and Drainage District Act* restricts the District to applying money raised from development cost charges to funding sewer capital projects, including the repayment of debt raised to fund such projects. The balance of these amounts is included in deferred revenue until spent on approved purposes.
- b) In 2017, the District received a grant from the Province of British Columbia in the amount of \$193,000,000 for future costs associated with the construction of the new North Shore Wastewater Treatment Plant Facility. During 2022, \$15,386,618 (2021 – \$20,488,722) was applied against the project and recognized as revenue. Interest earned on unspent funds in the amount of \$1,670,548 (2021 - \$1,037,820) has been recognized as grant revenue in the year.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 8
Year ended December 31, 2022

5. Deferred Revenue and Refundable Deposits (continued)

Continuity of deferred revenue is as follows:

	2022	2021
Balance, beginning of year	\$ 329,169,804	\$ 302,785,287
Development cost charges received	68,940,747	85,104,514
Interest earned	8,274,886	3,628,051
Change in refundable deposits	57,107	344,959
Amounts spent and recognized as revenue	(75,969,262)	(62,693,007)
Change in deferred revenue	1,303,478	26,384,517
Balance, end of year	\$ 330,473,282	\$ 329,169,804

6. Debt

- a) All borrowings for the District are obtained from MFA by the MVRD on the District's behalf, although the District maintains the right to finance debt without MFA involvement.

Debt, debentures or other security issued by the District is a direct, joint and several obligation and liability of the District and each and every member municipality.

Debt servicing requirements comprising sinking fund contributions, serial repayments and interest are funded as incurred by revenue earned during the year.

- b) Debt (net of sinking funds) reported on the statement of financial position comprises the following and includes varying maturities up to 2037 with interest rates ranging from 1.28% to 3.40%.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 9
Year ended December 31, 2022

6. Debt (continued)

Issue Number	Interest Rate - %	Maturity Date	Debentures authorized to be issued	Debenture debt outstanding	
				2022	2021
104	2.90	November 20, 2023	\$ 15,000,000	\$ 15,000,000	\$ 15,000,000
106	2.25	October 13, 2024	20,000,000	20,000,000	20,000,000
116	1.47	April 4, 2026	20,000,000	20,000,000	20,000,000
118	3.39 - 3.40	April 11, 2027	20,000,000	20,000,000	20,000,000
139	2.10	October 5, 2031	55,000,000	55,000,000	55,000,000
141	2.80	April 7, 2032	50,000,000	50,000,000	50,000,000
142	3.15	October 4, 2032	50,000,000	50,000,000	50,000,000
145	3.15	April 23, 2033	120,000,000	120,000,000	120,000,000
146	3.20	September 19, 2033	270,000,000	270,000,000	270,000,000
147	2.66	April 9, 2034	40,000,000	40,000,000	40,000,000
149	2.24	October 9, 2034	46,000,000	46,000,000	46,000,000
150	1.99	April 9, 2035	125,000,000	125,000,000	125,000,000
151	1.28	June 1, 2035	70,000,000	70,000,000	70,000,000
154	2.41	May 28, 2036	370,000,000	370,000,000	370,000,000
157	3.36	April 8, 2037	160,000,000	160,000,000	—
Total debt			\$1,431,000,000	\$1,431,000,000	\$1,271,000,000
Less sinking funds				(252,855,909)	(176,015,168)
Total net debt				\$1,178,144,091	\$1,094,984,832

c) Sinking fund installments due within the next five years and thereafter are as follows:

	Amount
2023	\$ 79,490,898
2024	78,741,781
2025	77,742,959
2026	77,742,959
2027	76,669,328
Thereafter	568,886,107
Total payments	959,274,032
Estimated sinking fund income	218,870,059
Total net debt	\$1,178,144,091

d) Sinking fund installments are invested by the MFA and earn income that, together with principal payments, are expected to be sufficient to retire the sinking fund debt at maturity. For sinking fund agreements, the MFA has established either a normal sinking fund or a capital repayment equalization fund.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 10
Year ended December 31, 2022

7. Tangible Capital Assets

Year ended December 31, 2022

	Cost			Accumulated Amortization				Net Book Value December 31, 2022
	Balance at December 31, 2021	Additions (Net of Transfers)	Disposals	Balance at December 31, 2022	Balance at December 31, 2021	Amortization Expense	Balance at December 31, 2022	
Land	\$ 162,871,774	\$ 23,590,000	\$ (104,118)	\$ 186,357,656	\$ —	\$ —	\$ —	\$ 186,357,656
Infrastructure	2,168,652,126	300,884,565	—	2,469,536,691	708,339,346	44,808,849	753,148,195	1,716,388,496
Machinery, equipment, furniture & fixtures	8,817,695	171,257	—	8,988,952	7,874,742	360,109	8,234,851	754,101
Construction in progress	1,579,940,189	65,367,899	—	1,645,308,088	—	—	—	1,645,308,088
	\$3,920,281,784	\$ 390,013,721	\$ (104,118)	\$4,310,191,387	\$ 716,214,088	\$ 45,168,958	\$ 761,383,046	\$3,548,808,341

Construction in progress includes \$522.6 million (2021- \$495.7 million) related to the North Shore Wastewater Treatment Plant (note 10).

Year ended December 31, 2021

	Cost			Accumulated Amortization				Net Book Value December 31, 2021
	Balance at December 31, 2020	Additions (Net of Transfers)	Disposals	Balance at December 31, 2021	Balance at December 31, 2020	Amortization Expense	Balance at December 31, 2021	
Land	\$ 116,049,774	\$ 46,822,000	\$ —	\$ 162,871,774	\$ —	\$ —	\$ —	\$ 162,871,774
Infrastructure	1,621,113,077	547,539,049	—	2,168,652,126	676,346,965	31,992,381	708,339,346	1,460,312,780
Machinery, equipment, furniture & fixtures	8,798,644	19,051	—	8,817,695	7,389,879	484,863	7,874,742	942,953
Construction in progress	1,707,335,425	(127,395,236)	—	1,579,940,189	—	—	—	1,579,940,189
	\$3,453,296,920	\$ 466,984,864	\$ —	\$3,920,281,784	\$ 683,736,844	\$ 32,477,244	\$ 716,214,088	\$3,204,067,696

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 11
Year ended December 31, 2022

8. Accumulated Surplus

Accumulated surplus consists of individual fund surplus and reserves as follows:

	2022	2021
Reserves	\$ 165,870,733	\$ 158,922,150
Capital fund balance	(79,768,553)	43,142,326
Investment in tangible capital assets	2,370,664,250	2,109,082,864
Total	\$ 2,456,766,430	\$ 2,311,147,340

Capital fund balance represents the future expected level of funding required or accumulated.

Continuity of reserves is as follows:

	December 31, 2021	Interest	Annual Operating Surplus (Deficit)	Contributions from/ (to) operations	December 31, 2022
Operating Reserves					
Liquid Waste Services	\$ 32,955,112	\$ 797,011	\$14,021,176	\$ (3,331,000)	\$ 44,442,299
Solid Waste Services	39,213,470	948,368	(2,342,763)	—	37,819,075
	72,168,582	1,745,379	11,678,413	(3,331,000)	82,261,374
Discretionary Reserves					
Biosolids Inventory	20,029,362	484,406	—	(4,704,240)	15,809,528
Liquid Waste General Debt					
Reserve Fund	2,123,350	51,353	—	—	2,174,703
Lions Gate Contingency	1,490,171	36,039	—	—	1,526,210
Drainage General	5,291,911	127,984	—	—	5,419,895
Solid Waste General	26,562,376	436,471	—	—	26,998,847
Landfill Post-Closure	11,307,274	273,464	—	—	11,580,738
	66,804,444	1,409,717	—	(4,704,240)	63,509,921
Statutory Reserves					
Liquid Waste Laboratory Equipment	607,946	16,219	—	101,285	725,450
Liquid Waste Services Sustainability					
Innovation Fund	19,341,178	482,606	—	(449,796)	19,373,988
	19,949,124	498,825	—	(348,511)	20,099,438
Total Reserves	\$158,922,150	\$3,653,921	\$11,678,413	\$ (8,383,751)	\$ 165,870,733

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 12

Year ended December 31, 2022

8. Accumulated Surplus (continued)

Investment in tangible capital assets is calculated as follows:

	2022	2021
Tangible capital assets	\$ 3,548,808,341	\$ 3,204,067,696
Amounts financed by:		
Long-term debt	(1,178,144,091)	(1,094,984,832)
	2,370,664,250	2,109,082,864
Change in the investment in tangible capital assets		
Acquisition of tangible capital assets	390,013,721	466,984,864
Amortization of tangible capital assets	(45,168,958)	(32,477,244)
Disposal of tangible capital assets (net of book value)	(104,118)	—
	344,740,645	434,507,620
Less funding of tangible capital assets through debt		
Sinking fund debt maturity	—	10,000,000
Sinking fund and debt retirement	(70,418,496)	(49,447,673)
Sinking fund and debt retirement income	(6,422,245)	(5,014,043)
Debenture debt issued	160,000,000	370,000,000
Debenture debt maturity	—	(10,000,000)
	83,159,259	315,538,284
Change in investment in tangible capital assets	261,581,386	118,969,336
Investment in tangible capital assets, beginning of year	2,109,082,864	1,990,113,528
Investment in tangible capital assets, end of year	\$ 2,370,664,250	\$ 2,109,082,864

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 13
Year ended December 31, 2022

9. Contractual Obligations and Rights

a) Contractual Obligations

- i) As of December 31, 2022 the District had the following commitments outstanding related to capital projects in progress:

	2022	2021
Authorized for outstanding projects	\$ 5,139,887,000	\$ 4,040,767,000
Expended at December 31	(2,553,669,802)	(2,283,628,886)
Commitment remaining	\$ 2,586,217,198	\$ 1,757,138,114

- ii) The District is committed under lease and rights-of-way agreements to make minimum annual payments. These agreements have varying terms, including two agreements, with annual payments of \$454,000 to perpetuity, with adjustments annually for CPI. Estimated payments over the next ten years are as follows:

	Amount
2023	\$ 1,908,271
2024	1,939,955
2025	1,972,272
2026	2,005,236
2027	2,038,859
2028 - 2032	10,722,652
Total	\$ 20,587,245

b) Contractual Rights

The District is party to lease agreements that are anticipated to provide future revenues. These agreements are with third parties with varying terms to 2026. Amounts anticipated to be received over the future years are as follows:

	Amount
2023	\$ 1,320,183
2024	1,117,471
2025	710,899
2026	651,657
Total	\$ 3,800,210

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 14

Year ended December 31, 2022

10. Contingencies

Lawsuits

As at December 31, 2022, there were various lawsuits pending against the District arising in the ordinary course of business. The District has retained legal counsel to defend against these lawsuits. Where the outcomes or amounts cannot be reasonably determined, no liability has been recorded. Management is of the opinion that losses, if any, in connection with these lawsuits can be sufficiently funded by reserve funds or covered by insurance. Any expected losses will be accrued and recorded as expenses at the time they are considered likely and amounts are reasonably determinable.

North Shore Wastewater Treatment Plant

The District is building a new tertiary wastewater treatment plant on a former industrial site in North Vancouver to replace the primary-only Lions Gate Wastewater Treatment Plant. The deadline for completion of the project under federal regulation was December 31, 2020. In 2021, the District served notice to terminate its contract with the vendor hired to design, build and commission the future North Shore Wastewater Treatment Plant, having determined that the vendor was in breach of contract. As of the contract termination date in 2021, the District has paid \$309.5 million, net of GST rebates, to the vendor for work completed, which has been recorded as construction in progress (note 7). In 2022, the vendor commenced legal action by filing a claim against the District in excess of \$250 million to which the District filed a counter-claim against the vendor in excess of \$500 million. In 2022, the District also drew on an irrevocable letter of credit in the amount of \$50.0 million as a result of the contract termination. As at December 31, 2022, the outcome of any legal proceedings related to the terminated contract and the potential consequences of not meeting the current deadline under the federal regulation is undeterminable.

Due to the nature of the contractual payments made to date under the terminated contract, the outstanding litigation and uncertainty surrounding the value of the new contract for completion of the project, the amount recorded as work in progress of \$522.6 million (2021 - \$495.7 million) represents management's best estimate. This amount may be subject to material change as new information becomes available.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 15

Year ended December 31, 2022

10. Contingencies (continued)

Self-Insurance Reserve

A self-insurance reserve has been established within the MVRD to cover losses resulting from uninsured liability exposures of the District, other MVRD Districts, and Metro Vancouver Housing Corporation ("MVHC").

Each year a review is undertaken to determine if it would be beneficial to purchase additional liability insurance. The District, other Metro Vancouver Districts, and the MVHC transfer amounts to the reserve depending on the reserve's adequacy to cover retained liability risk.

An estimate is made for all costs of investigating and settlement of claims annually and an adjustment is made to the reserve to maintain an adequate balance to cover potential losses in excess of recorded liabilities. These estimates are changed as additional information becomes known during the course of claims settlement. Any likely losses would be expensed at the time the losses are known and the amounts are reasonably determinable.

Debt Reserve Fund

The MFA is required to establish a Debt Reserve Fund for each debenture which is comprised of cash deposits and a non-interest bearing demand note (refer to note 2).

Letters of Credit

At December 31, 2022, the District is the named beneficiary of \$758 thousand (2021 - \$60.37 million) of irrevocable letters of credits from financial institutions related to construction projects and Solid Waste operations. These letters of credit are available under circumstances in which the service provider does not fulfil its obligation to the District and therefore the amount is not recorded as assets.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 16
Year ended December 31, 2022

11. Budget Information

The annual budget presented in these financial statements is based upon the 2022 operating and capital budgets originally approved by the District's Board in October 2021, with additional approval in February 2022 for adjustments to the budget as a result of the 2021 fiscal year end results. The budget is based on operational and capital expenditure requirements and their associated funding. Amortization is a non-cash item that is not funded for budget purposes. Also, contributions to or from reserves and debt principal repayments are removed from the approved budget for financial statement presentation. The schedule below reconciles the approved budget to the budget figures reported in these financial statements. Capital expenditures of \$831,292,000 were included in the capital budget approved by the Board.

	2022 Budget	2021 Budget
Budgeted annual surplus per Exhibit B- Statement of Operations	\$ 257,309,608	\$ 397,271,819
Additional transfers from reserves, approved by Board	210,000	1,049,675
Adjusted annual surplus, based on originally approved budget	257,519,608	398,321,494
Items not included in the approved operating budget		
Capital development cost charge revenue	(42,329,000)	(45,000,000)
Capital grants and contributions	(110,665,000)	(251,931,864)
Amortization of tangible capital assets	43,785,108	35,014,719
Sinking and debt retirement fund income	(7,398,610)	(5,450,233)
Reserve interest	(2,420,014)	(2,040,238)
Items included in the budget but not in financial statements		
Debt principal payments	(70,418,497)	(49,447,674)
Transfers to capital	(76,355,495)	(80,068,136)
Transfers from reserves	8,281,900	601,932
Annual surplus per approved budget	\$ —	\$ —

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 17
Year ended December 31, 2022

12. Segmented Information and Expenses by Object

The District's primary responsibilities are the collection, treatment and discharge of liquid waste for the municipalities of the MVRD and the disposal of solid waste both for the municipalities of the MVRD and the public. For management reporting purposes, the District's operations and activities are organized and reported by these two primary areas of service.

The information reported in the segmented information does not include \$8,634,903 (2021 - \$9,052,489) of salaries and benefits directly attributable to the construction of tangible capital assets which have been included in the cost of tangible capital assets in the Statement of Financial Position.

The services disclosed in the Segmented Information are as follows:

Liquid Waste Services

The Liquid Waste Services is responsible for the collection, treatment and discharge of liquid waste for member municipalities. It operates a number of wastewater treatment plants and a related collection network connected to the member municipalities' systems.

Solid Waste Services

The Solid Waste Services is responsible for the disposal of solid waste both for the member municipalities and the public. It owns and operates several solid waste facilities including a waste-to-energy facility.

	2022 Total Budget	Liquid Waste Services	Solid Waste Services	2022 Total Actual	2021 Total Actual
Revenues					
Sewerage and drainage levy	\$ 301,424,687	\$ 301,424,687	\$ —	\$ 301,424,687	\$ 288,225,540
Tipping fees	112,909,870	—	125,797,098	125,797,098	112,609,847
BODTSS Industrial Charges	12,262,636	12,431,402	—	12,431,402	12,157,191
Development cost charges	103,080,328	60,582,644	—	60,582,644	42,204,285
User fees, recoveries, and other	19,116,187	6,588,532	14,201,133	20,789,665	15,246,793
Sinking fund, debt retirement and interest income	9,818,623	8,439,471	1,968,994	10,408,465	6,579,921
Grants and contributions	106,415,000	29,870,139	—	29,870,139	61,062,379
	665,027,331	419,336,875	141,967,225	561,304,100	538,085,956
Expenses					
Salaries and benefits	74,535,355	65,693,835	6,517,150	72,210,985	67,654,156
Consulting, contracted, and professional services	137,122,031	42,470,999	102,395,630	144,866,629	110,621,342
Asset repairs and maintenance	13,914,405	13,980,943	859,552	14,840,495	12,634,023
Materials and supplies	18,800,063	18,018,094	44,508	18,062,602	16,187,093
Utilities, permits, and taxes	18,230,199	16,828,867	468,953	17,297,820	15,883,139
Corporate costs	44,288,552	37,661,273	5,114,271	42,775,544	37,107,276
Other	18,029,271	9,179,417	16,723,815	25,903,232	17,777,435
Amortization of tangible capital assets	43,785,108	36,786,878	8,382,080	45,168,958	32,477,244
Interest on long-term debt	39,012,739	32,134,993	2,423,752	34,558,745	29,655,148
	407,717,723	272,755,299	142,929,711	415,685,010	339,996,856
Annual surplus (deficit)	\$ 257,309,608	\$ 146,581,576	\$ (962,486)	\$ 145,619,090	\$ 198,089,100

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT

Notes to Financial Statements, page 18

Year ended December 31, 2022

13. Subsequent Event

On March 28, 2023, the District entered into a three-year contribution agreement with the Province of British Columbia, where the Province will provide \$250 million, one-third of the funding, for Phase 1 Iona Wastewater Treatment Plant. The District will receive \$75 million in April 2023 and in April 2024, and the remaining \$100 million in April 2025.

14. Comparative Figures

Certain prior year figures have been reclassified to conform to the presentation of the current year.

Financial Statements of

**GREATER VANCOUVER
WATER DISTRICT**

Year ended December 31, 2022

DRAFT - April 3, 2023

GREATER VANCOUVER WATER DISTRICT

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December 31, 2022

Exhibit

Management Report

Independent Auditor's Report

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A

Statement of Operations

B

Statement of Change in Net Debt

C

Statement of Cash Flows

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Notes to Financial Statements

GREATER VANCOUVER WATER DISTRICT

MANAGEMENT REPORT

The Financial Statements contained in this report have been prepared by management in accordance with Canadian public sector accounting standards. The integrity and objectivity of these statements are management's responsibility. Management is responsible for all the statements and schedules, and for ensuring that this information is consistent, where appropriate, with the information contained in the financial statements.

Management is also responsible for implementing and maintaining a system of internal controls to provide reasonable assurance that reliable financial information is produced.

The Greater Vancouver Water District's Board of Directors is responsible for approving the financial statements and for ensuring that management fulfills its responsibilities for financial reporting and internal control and exercises this responsibility through the Finance Committee of the Board.

The external auditors, BDO Canada LLP, conduct an independent examination, in accordance with Canadian generally accepted auditing standards, and express their opinion on the financial statements. Their examination does not relate to the other schedules and statements required by the *Financial Information Act*. The Independent Auditor's Report outlines the scope of the audit for the year ended December 31, 2022.

On behalf of Greater Vancouver Water District.

Dean Rear, Chief Financial Officer

Date: April 28, 2023

Independent Auditor's Report

To the Board of Directors of the Greater Vancouver Water District

Opinion

We have audited the financial statements of the Greater Vancouver Water District (the "District"), which comprise the Statement of Financial Position as at December 31, 2022, and the Statements of Operations, Change in Net Debt and Cash Flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the District as at December 31, 2022, and the results of its operations, change in net debt and cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the District in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the District's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the District or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the District's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the District's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the District to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Chartered Professional Accountants

Vancouver, British Columbia
REPORT DATE

GREATER VANCOUVER WATER DISTRICT

Exhibit A

Statement of Financial Position

As at December 31, 2022

	2022	2021
Financial Assets		
Cash	\$ 2,203,332	\$ 1,780,988
Accounts receivable	68,590,081	48,357,266
Due from (to) Metro Vancouver Regional District	37,192,659	169,401,485
Debt reserve fund (note 2)	14,795,936	15,647,006
	122,782,008	235,186,745
Liabilities		
Accounts payable and accrued liabilities (note 3)	75,750,659	69,616,281
Debt (net of sinking funds) (note 4)	663,510,847	711,163,290
	739,261,506	780,779,571
Net Debt	(616,479,498)	(545,592,826)
Non-Financial Assets		
Tangible capital assets (note 5)	3,110,383,676	2,855,862,044
Inventories of supplies	4,802,826	4,356,061
Prepaid expenses	543,426	562,801
	3,115,729,928	2,860,780,906
Accumulated surplus (note 6)	\$ 2,499,250,430	\$ 2,315,188,080

Contractual obligations and rights (note 7)

Contingencies (note 8)

Budget information (note 9)

Segmented information and expenses by object (note 10)

The accompanying notes are an integral part of these financial statements.

Chief Financial Officer

Board Chair

GREATER VANCOUVER WATER DISTRICT

Exhibit B

Statement of Operations

Year ended December 31, 2022

	2022 Budget (note 9)	2022 Actual	2021 Actual
Revenues (note 10)			
Metered sale of water	\$ 329,365,517	\$ 329,678,422	\$ 319,989,323
Sinking fund, debt retirement, and interest income	18,167,873	21,513,338	20,734,421
Interest income	875,003	1,324,801	630,564
Building income from Metro Vancouver Districts	9,855,082	9,551,771	9,616,135
Building income from external parties	5,928,533	5,567,080	6,634,971
Other revenue	1,657,055	10,309,539	10,660,566
	365,849,063	377,944,951	368,265,980
Expenses (note 10)			
Water operations	187,753,243	177,794,239	167,532,829
Building operations	17,028,404	16,088,362	16,964,422
	204,781,647	193,882,601	184,497,251
Annual surplus	161,067,416	184,062,350	183,768,729
Accumulated surplus, beginning of year	2,315,188,080	2,315,188,080	2,131,419,351
Accumulated surplus, end of year	\$ 2,476,255,496	\$ 2,499,250,430	\$ 2,315,188,080

The accompanying notes are an integral part of these financial statements.

GREATER VANCOUVER WATER DISTRICT

Exhibit C

Statement of Change in Net Debt

Year ended December 31, 2022

	2022 Budget (note 9)	2022 Actual	2021 Actual
Annual surplus	\$ 161,067,416	\$ 184,062,350	\$ 183,768,729
Change in tangible capital assets:			
Acquisition of tangible capital assets	(471,273,000)	(297,348,541)	(215,953,824)
Amortization of tangible capital assets	41,245,313	42,826,909	41,422,851
	(430,027,687)	(254,521,632)	(174,530,973)
Change in other non-financial assets:			
Acquisition of prepaid expenses	-	(543,426)	(562,801)
Use of prepaid expenses	-	562,801	617,268
Acquisition of inventories of supplies	-	(4,802,826)	(4,356,061)
Consumption of inventories of supplies	-	4,356,061	4,312,253
	-	(427,390)	10,659
Changes in net debt	(268,960,271)	(70,886,672)	9,248,415
Net debt, beginning of year	(545,592,826)	(545,592,826)	(554,841,241)
Net debt, end of year	\$ (814,553,097)	\$ (616,479,498)	\$ (545,592,826)

The accompanying notes are an integral part of these financial statements.

GREATER VANCOUVER WATER DISTRICT

Exhibit D

Statement of Cash Flows

Year ended December 31, 2022

	2022	2021
Cash provided by (used in):		
Operating transactions:		
Annual surplus	\$ 184,062,350	\$ 183,768,729
Items not involving cash:		
Amortization	42,826,909	41,422,851
Sinking fund income	(21,462,663)	(20,696,085)
Debt reserve fund income	(355,728)	(111,875)
Change in non-cash assets and liabilities:		
Accounts receivable	(20,232,815)	4,293,919
Prepaid expenses	19,375	54,467
Accounts payable and accrued liabilities	6,134,378	14,713,059
Inventories of supplies	(446,765)	(43,808)
Net change in cash from operating transactions	190,545,041	223,401,257
Capital transactions:		
Acquisition of tangible capital assets	(297,348,541)	(215,953,824)
Net change in cash from capital transactions	(297,348,541)	(215,953,824)
Financing transactions:		
Due from Metro Vancouver Regional District	132,208,826	(179,390,919)
Debenture debt issued	40,000,000	230,000,000
Debt reserve fund issuance	(400,000)	(2,300,000)
Debt reserve fund maturity	1,606,798	791,709
Sinking fund payments	(66,189,780)	(55,877,869)
Net change in cash from financing transactions	107,225,844	(6,777,079)
Net change in cash and cash equivalents	422,344	670,354
Cash and cash equivalents, beginning of year	1,780,988	1,110,634
Cash and cash equivalents, end of year	\$ 2,203,332	\$ 1,780,988

The accompanying notes are an integral part of these financial statements.

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 1

Year ended December 31, 2022

1. Significant Accounting Policies

The Greater Vancouver Water District (the “District”) was established by an Act of the same name in 1924. Its primary responsibility is the supply of potable water to its member municipalities. Its Board of Directors comprises the same councillors and mayors as appointed to the Metro Vancouver Regional District (“MVRD”) Board by the participating municipalities.

The District owns or holds under a 999-year lease from the Province an extensive closed watershed network as its source of supply. It owns a series of dams, reservoirs, water treatment plants and a distribution network connecting to the municipal distribution systems. The member municipalities under the Act are jointly and severally liable for its debts. The District also owns and is responsible for operating and maintaining office buildings that are leased to MVRD and its related entities.

The District’s financial statements are prepared by management in accordance with Canadian public sector accounting standards (“PSAS”). Significant accounting policies adopted by the District are as follows:

Basis of Accounting The District follows the accrual method of accounting for revenues and expenses. Revenues are recognized in the year in which they are earned and measurable. Expenses are recognized as they are incurred and measurable as a result of the receipt of goods or services and/or the legal obligation to pay.

Government Transfers Government transfers are recognized as revenue in the financial statements when the transfer is authorized and any eligibility criteria are met, except to the extent that transfer stipulations give rise to an obligation that meets the definition of a liability. The transfer of revenue is initially deferred and then recognized in the statement of operations as the stipulation liabilities are settled.

When the District is deemed the transferor, the transfer expense is recognized when the recipient is authorized and has met the eligibility criteria.

Sinking Fund, Debt Retirement, and Interest Income Interest income is reported as revenue in the period earned. When required, based on external restrictions, interest income earned on deferred revenue is added to and forms part of the deferred revenue balance and is recognized into income when related stipulations are met. Any surpluses received from upon debt retirement are recorded in the year received.

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 2

Year ended December 31, 2022

1. Significant Accounting Policies (continued)

Cash and Investments

In order to improve cash management, the MVRD holds cash and investment transactions in pooled accounts on behalf of its four legal entities: the Metro Vancouver Regional District, the Greater Vancouver Sewerage and Drainage District, the Greater Vancouver Water District, and the Metro Vancouver Housing Corporation. The District's main cash is therefore presented as due from MVRD. Investments held by the MVRD consist of bonds issued by governments and Canadian chartered banks, money market instruments, guaranteed investment certificates, and term deposits. Interest earned on the District's fund balances is included in the amount owing from MVRD and is recorded as interest income in the Statement of Operations.

Employee Future Benefits

Employees who provide services for the District are employees of the MVRD. Employee related costs are allocated by the MVRD to the District based on services rendered. These costs are shown as expenses in the financial statements and are included in amounts owing to MVRD.

Post-employment benefits of the MVRD, including accumulated banked sick and vacation pay, retirement severance and Worker's Compensation top-up benefits for employees pursuant to certain policies and union agreements, are actuarially determined based on service and best estimates of retirement ages and expected future salary and wage increases. The obligation under these benefit plans is allocated to the District based on projected benefits as the employees render services necessary to earn the future benefits and included in amounts owing to MVRD.

Non-Financial Assets

Non-financial assets are not available to discharge existing liabilities and are held for use in the provision of services. They have useful lives extending beyond the current year and are not intended for sale in the ordinary course of operations.

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 3

Year ended December 31, 2022

1. Significant Accounting Policies (continued)

Non-Financial Assets (continued)

Tangible Capital Assets

Tangible capital assets are recorded at cost which includes amounts that are directly attributable to acquisition, construction, development, or betterment of the asset. The cost, less residual value, of the tangible capital assets, excluding land, is amortized on a straight line basis over the estimated useful lives of the assets as follows:

Asset	Useful Life Years
Buildings	
Corporate head office	40
Watershed	25
Infrastructure	
Dams and reservoirs	150
Supply mains	100
Distribution systems, drinking water treatment	50
Bridges and roads	50
Vehicles	5 - 10
Machinery, Equipment, Furniture and Fixtures	5 - 20

a. Annual amortization:

Annual amortization begins when the asset is available for use and is expensed over its useful life. Assets under construction are transferred to the appropriate asset class and are amortized from the date the asset is available for use.

b. Contributions of tangible capital assets:

Contributions of tangible capital assets are recorded at their estimated fair value at the date of receipt and as contribution revenue.

c. Interest capitalization:

The District does not capitalize interest costs associated with the acquisition or construction of a tangible capital asset.

Inventories of Supplies

Inventories of supplies held for consumption are recorded on a first-in-first-out basis.

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 4

Year ended December 31, 2022

1. Significant Accounting Policies (continued)

Revenue Recognition	Metered sale of water, building income from external tenants, Metro Vancouver Districts and Housing Corporation, and other income are recognized as revenue on an accrual basis according to the usage and rates approved and set by the Board.
Use of Estimates	<p>The preparation of these financial statements requires management to make estimates and assumptions that affect the reported amounts in the financial statements and the disclosure of contingent liabilities. These estimates and assumptions are based on management's best information and judgment and may differ from actual results. Adjustments, if any, will be reflected in the financial statements in the period that the change in estimate is made, as well as in the period of settlement if the amount is different.</p> <p>Significant areas requiring the use of management's judgment relates to the determination of contaminated sites liabilities, the amortization rates of tangible capital assets and the assessment of the outcome of contingent liabilities.</p>
Segmented Information	A segment is defined as a distinguishable activity or group of activities of a government for which it is appropriate to separately report financial information to achieve the objectives of the standard. Definitions of the District's segments and their related financial information are presented in note 10.
Liabilities for Contaminated Sites	A liability for remediation of a contaminated site is recognized when the site is no longer in productive use and the following criteria are satisfied: an environmental standard exists; contamination exceeds the standard; the District is either directly responsible or has accepted responsibility for remediation; it is expected that future economic benefits will be given up and a reasonable estimate of the liability can be made. Liabilities for contaminated sites are reported in accounts payable and accrued liabilities (note 3).

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 5

Year ended December 31, 2022

2. Debt Reserve Fund

The Municipal Finance Authority of British Columbia ("MFA") provides financing for regional districts and member municipalities. The MFA is required to establish a Debt Reserve Fund for each debenture issue equal to one-half the average annual installment of principal and interest. The debt reserve fund is comprised of cash deposits equal to 1% of the principal amount borrowed and a non-interest bearing demand note for the remaining requirement. Cash deposits held by the MFA are payable with interest to the ultimate borrower when the final obligations under the respective loan agreements have been made.

If, at any time, the District has insufficient funds to meet payments due on its obligations to the MFA, the payments will be made from the debt reserve fund. The demand notes are callable only if there are additional requirements to be met in order to maintain the level of the debt reserve fund. At December 31, 2022, \$39,209,792 (2021 - \$41,402,712) in callable demand notes were outstanding and have not been recorded in the statement of financial position.

3. Accounts Payable and Accrued Liabilities

	2022	2021
Trade accounts	\$ 31,593,697	\$ 37,400,180
Construction holdbacks	36,610,812	25,870,577
Accrued interest on debt	6,051,290	5,883,967
Contaminated sites (a)	1,494,860	461,557
	\$ 75,750,659	\$ 69,616,281

- (a) In 2022, the District accrued \$1,494,860 to remediate contaminated soils at two of its properties. The remediation work for the properties will be completed in 2024 and 2026.

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 6

Year ended December 31, 2022

4. Debt

- a) All borrowings for the District are obtained from MFA by the MVRD on the District's behalf, although the District maintains the right to finance debt without MFA involvement.

Debt, debentures or other security issued by the District is a direct, joint and several obligation and liability of the District and each and every member municipality.

Debt servicing requirements comprising sinking fund contributions, serial repayments and interest are funded as incurred by revenue earned during the year.

- b) Principal payments and sinking fund installments due within the next five years and thereafter are as follows:

	Total Payments
2023	\$ 64,541,985
2024	60,764,893
2025	53,773,139
2026	47,331,355
2027	45,720,909
Thereafter	239,717,480
Total payments	511,849,761
Estimated sinking fund income	151,661,086
Total debt	\$ 663,510,847

- c) Sinking fund installments are invested by the MFA and earn income that, together with principal payments, are expected to be sufficient to retire the sinking fund debt at maturity. For sinking fund agreements, the MFA has established either a normal sinking fund or a capital repayment equalization fund.

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 7

Year ended December 31, 2022

4. Debt (continued)

- d) Debt (net of sinking funds) reported on the Statement of Financial Position comprises the following and includes varying maturities up to 2037 with interest rates ranging from 0.70% to 3.85%.

Issue number	Interest rate - %	Maturity date	Debentures authorized to be issued	Debenture debt outstanding	
				2022	2021
67	0.70%-1.75%	November 5, 2022	\$ 706,000	\$ —	\$ 706,000
67	0.70%-1.75%	November 5, 2022	14,294,000	—	14,294,000
102	2.25%	December 1, 2022	80,000,000	—	80,000,000
103	2.65%	April 23, 2023	40,000,000	40,000,000	40,000,000
104	2.90%	November 20, 2023	35,630,930	35,630,930	35,630,930
105	2.25%	June 3, 2024	60,000,000	60,000,000	60,000,000
106	2.25%	October 13, 2024	80,000,000	80,000,000	80,000,000
110	1.28%	April 8, 2025	50,000,000	50,000,000	50,000,000
112	1.28%	October 6, 2025	70,000,000	70,000,000	70,000,000
116	1.47%	April 4, 2026	30,000,000	30,000,000	30,000,000
118	3.39% - 3.40%	April 11, 2027	70,000,000	70,000,000	70,000,000
121	2.90% - 3.39%	October 4, 2027	20,000,000	20,000,000	20,000,000
126	3.85%	September 26, 2028	70,000,000	70,000,000	70,000,000
127	3.30%	April 7, 2029	60,000,000	60,000,000	60,000,000
130	3.00%	October 14, 2029	50,000,000	50,000,000	50,000,000
131	2.20%	April 8, 2030	60,000,000	60,000,000	60,000,000
137	2.60%	April 19, 2031	20,000,000	20,000,000	20,000,000
137	2.60%	April 19, 2031	80,000,000	80,000,000	80,000,000
141	2.80%	April 7, 2032	50,000,000	50,000,000	50,000,000
147	2.66%	April 9, 2034	22,000,000	22,000,000	22,000,000
150	1.99%	April 9, 2035	40,000,000	40,000,000	40,000,000
151	1.28%	June 1, 2035	30,000,000	30,000,000	30,000,000
153	2.41%	April 15, 2036	100,000,000	100,000,000	100,000,000
154	2.41%	May 28, 2036	130,000,000	130,000,000	130,000,000
157	3.36%	April 8, 2037	40,000,000	40,000,000	
Debt			\$ 1,302,630,930	\$ 1,207,630,930	\$ 1,262,630,930
Less sinking funds				(544,120,083)	(551,467,640)
Total debt (net of sinking funds)				\$ 663,510,847	\$ 711,163,290

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 8

Year ended December 31, 2022

5. Tangible Capital Assets

Year ended December 31, 2022

	Cost		Balance at December 31, 2022	Balance at December 31, 2021	Amortization Expense	Balance at December 31, 2022	Net book value December 31, 2022	Net book value December 31, 2021
	Balance at December 31, 2021	Additions						
Land	\$ 53,664,152	\$ 79,050,000	\$ 132,714,152	\$ -	\$ -	\$ -	\$ 132,714,152	\$ 53,664,152
Infrastructure	2,245,795,214	180,999,192	2,426,794,406	437,619,616	36,321,766	473,941,382	1,952,853,024	1,808,175,598
Buildings	216,476,101	-	216,476,101	24,687,670	5,463,049	30,150,719	186,325,382	191,788,431
Machinery, equipment furniture & fixtures	13,197,425	425,409	13,622,834	7,424,225	1,042,094	8,466,319	5,156,515	5,773,200
Assets under construction	796,460,663	36,873,940	833,334,603	-	-	-	833,334,603	796,460,663
	\$ 3,325,593,555	\$ 297,348,541	\$ 3,622,942,096	\$ 469,731,511	\$ 42,826,909	\$ 512,558,420	\$ 3,110,383,676	\$ 2,855,862,044

Year ended December 31, 2020

	Cost		Balance at December 31, 2021	Balance at December 31, 2020	Amortization Expense	Balance at December 31, 2021	Net book value December 31, 2021	Net book value December 31, 2020
	Balance at December 31, 2020	Additions						
Land	\$ 44,704,207	\$ 8,959,945	\$ 53,664,152	\$ -	\$ -	\$ -	\$ 53,664,152	44,704,207
Infrastructure	2,118,001,989	127,793,225	2,245,795,214	402,689,372	34,930,244	437,619,616	1,808,175,598	1,715,312,617
Buildings	216,476,101	-	216,476,101	19,224,621	5,463,049	24,687,670	191,788,431	197,251,480
Machinery, equipment furniture & fixtures	13,197,425	-	13,197,425	6,394,667	1,029,558	7,424,225	5,773,200	6,802,758
Assets under construction	717,260,009	79,200,654	796,460,663	-	-	-	796,460,663	717,260,009
	\$ 3,109,639,731	\$ 215,953,824	\$ 3,325,593,555	\$ 428,308,660	\$ 41,422,851	\$ 469,731,511	\$ 2,855,862,044	2,681,331,071

6. Accumulated Surplus

Accumulated surplus consists of individual fund surplus and reserves as follows:

	2022	2021
Reserves	\$ 52,629,741	\$ 43,696,639
Capital fund balance	(252,140)	126,792,687
Investment in tangible capital assets	2,446,872,829	2,144,698,754
Accumulated surplus, end of year	\$ 2,499,250,430	\$ 2,315,188,080

Capital fund balance represents the future expected level of funding required or accumulated.

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 9

Year ended December 31, 2022

6. Accumulated Surplus (continued)

Continuity of reserves is as follows:

	December 31, 2021	Interest	Annual Operating Surplus	Contributions from / (to) operations	December 31, 2022
Designated reserves					
Sustainability innovation fund	\$ 14,309,567	\$ 355,597	\$ -	\$ (87,555)	\$ 14,577,609
Laboratory equipment	784,733	18,979	-	-	803,712
	15,094,300	374,576	-	(87,555)	15,381,321
Non-designated reserves					
Operating reserve	28,602,339	691,740	7,954,341	-	37,248,420
Total reserves	\$ 43,696,639	\$ 1,066,316	\$ 7,954,341	\$ (87,555)	\$ 52,629,741

Investment in tangible capital assets is calculated as follows:

	2022	2021
Tangible capital assets	\$ 3,110,383,676	\$ 2,855,862,044
Amounts financed by:		
Long-term debt	(663,510,847)	(711,163,290)
	\$ 2,446,872,829	\$ 2,144,698,754

The change in the investment in tangible capital assets is as follows:

	2022	2021
Change in the investment in tangible capital assets		
Acquisition of tangible capital assets	\$ 297,348,541	\$ 215,953,824
Amortization of tangible capital assets	(42,826,909)	(41,422,851)
	254,521,632	174,530,973
Less funding of tangible capital assets		
Sinking fund and debt retirement	(66,189,780)	(55,877,869)
Sinking fund income	(21,462,663)	(20,696,085)
Debenture debt issued	40,000,000	230,000,000
	(47,652,443)	153,426,046
Change in investment in tangible capital assets	302,174,075	21,104,927
Investment in tangible capital assets, beginning of year	2,144,698,754	2,123,593,827
Investment in tangible capital assets, end of year	\$ 2,446,872,829	\$ 2,144,698,754

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 10

Year ended December 31, 2022

7. Contractual Obligations and Rights

a) Contractual Obligations

- i) As at December 31, 2022, the District had the following commitments outstanding related to capital projects in progress:

	2022	2021
Authorized for outstanding projects	\$ 2,620,217,000	\$ 2,541,411,828
Expended at December 31	(1,030,341,454)	(1,112,159,228)
Commitment remaining	\$ 1,589,875,546	\$ 1,429,252,600

- ii) The District is committed under a lease agreement with annual payments of \$107,000 to perpetuity, with adjustments annually for CPI. Estimated payments over the next ten years are as follows:

	Amount
2023	\$ 117,343
2024	117,343
2025	117,343
2026	117,343
2027	117,343
2028 - 2032	586,715
Total	\$ 1,173,430

b) Contractual Rights

The District is party to several property lease agreements that are anticipated to provide future revenues. These agreements are with third parties with varying terms to 2035. Amounts anticipated to be received over the future years are as follows:

	Amount
2023	\$ 4,961,451
2024	4,359,140
2025	3,688,992
2026	2,475,990
2027	1,209,130
Thereafter	5,473,858
Total	\$ 22,168,561

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 11

Year ended December 31, 2022

8. Contingencies

Lawsuits

As at December 31, 2022, there were various lawsuits pending against the District arising in the ordinary course of business. The District has retained legal counsel to defend against these lawsuits. Where the outcomes or amounts cannot be reasonably determined, no liability has been recorded. Management is of the opinion that losses, if any, in connection with these lawsuits can be sufficiently funded by reserve funds or covered by insurance. Any expected losses will be accrued and recorded as expenses at the time they are considered likely and amounts are reasonably determinable.

Self-Insurance Reserve

A self-insurance reserve has been established within the MVRD to cover losses resulting from uninsured liability exposures of the District, other MVRD Districts, and Metro Vancouver Housing Corporation ("MVHC").

Each year a review is undertaken to determine if it would be beneficial to purchase additional liability insurance. The District, other Metro Vancouver Districts, and the MVHC transfer amounts to the reserve depending on the reserve's adequacy to cover retained liability risk.

An estimate is made for all costs of investigating and settlement of claims annually and an adjustment is made to the reserve to maintain an adequate balance to cover potential losses in excess of recorded liabilities. These estimates are changed as additional information becomes known during the course of claims settlement. Any likely losses would be expensed at the time the losses are known and the amounts are reasonably determinable.

Debt Reserve Fund

The MFA is required to establish a Debt Reserve Fund for each debenture which is comprised of cash deposits and a non-interest bearing demand note (refer to note 2). If, at any time, the District has insufficient funds to meet payments due on its obligations to MFA, the payments will be made from the debt reserve fund. The demand notes are callable only if there are additional requirements to be met to maintain the level of the debt reserve fund, and therefore have not been recorded in the statement of financial position.

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 12

Year ended December 31, 2022

9. Budget Information

The annual budget presented in these financial statements is based upon the 2022 operating and capital budgets originally approved by the District's Board in October 2021, with additional approval in February 2022 for adjustments to the budget as a result of the 2021 fiscal year end results. The budget is based on operational and capital expenditure requirements and their associated funding. Amortization is a non-cash item that is not funded for budget purposes. Also, contributions to or from reserves and debt principal repayments are removed from the approved budget for financial statement presentation. The schedule below reconciles the approved operating budget to the budget figures reported in these financial statements. Capital expenditures of \$471,273,000 were included in the capital budget approved by the Board.

	2022 Budget	2021 Budget
Budgeted annual surplus per Exhibit B - Statement of Operations	\$ 161,067,416	\$ 163,254,271
Additional transfers from reserves, approved by Board	1,540,000	-
Adjusted annual surplus, based on originally approved budget	162,607,416	163,254,271
Items not included in the operating budget		
Amortization of tangible capital assets	41,245,313	40,552,047
Sinking and debt retirement fund income	(18,167,873)	(17,594,045)
Reserve interest	(875,003)	(713,060)
Items included in the budget but not in financial statements		
Debt principal payments	(66,189,780)	(55,877,869)
Transfers to capital	(123,769,144)	(130,975,759)
Transfers from reserve funds	7,412,071	2,102,934
Transfers to reserve funds	(2,263,000)	(748,519)
Annual surplus per approved budget	\$ -	\$ -

GREATER VANCOUVER WATER DISTRICT

Notes to Financial Statements, page 13

Year ended December 31, 2022

10. Segmented Information and Expenses by Object

The District's primary responsibilities are the supply of potable water to the municipalities of the MVRD and the property management of the office buildings owned by the District. For management reporting purposes, the District's operations and activities are organized and reported by these two primary areas of service. The information reported in the segmented information does not include \$6,003,235 (2021 - \$7,168,137) of salaries and benefits directly attributable to the construction of tangible capital assets which have been included in the cost of tangible capital assets in the Statement of Financial Position.

The services disclosed in the Segmented Information are as follows:

Water Operations Water Operations is responsible for the supply of potable water to the District's member municipalities. The District owns a series of dams, reservoirs, water treatment plants and a distribution network connected to the member municipalities' systems.

Building Operations Building Operations is responsible for operating and maintaining office buildings owned by the District. These facilities are leased to MVRD and its related entities for its head office operations as well as to external parties.

	2022 Budget	Water Operations	Building Operations	Inter-Program Adjustments	2022 Total	2021 Total
Revenue						
Metered sale of water	\$ 329,365,517	\$ 329,678,422	\$ -	\$ -	\$ 329,678,422	\$ 319,989,323
Sinking fund, debt retirement and interest income	18,167,873	19,419,734	2,093,604	-	21,513,338	20,734,421
Interest income	875,003	1,324,801	-	-	1,324,801	630,564
Building income from Metro Vancouver Districts	9,855,082	-	15,397,687	(5,845,916)	9,551,771	9,616,135
Building income from external parties	5,928,533	-	5,567,080	-	5,567,080	6,634,971
Other income	1,657,055	10,160,578	148,961	-	10,309,539	10,660,566
	365,849,063	360,583,535	23,207,332	(5,845,916)	377,944,951	368,265,980
Expenses						
Salaries and benefits	50,706,726	44,722,966	493,511	-	45,216,477	42,710,659
Consulting, contracted and professional services	17,487,775	13,308,351	1,902,629	-	15,210,980	14,342,178
Asset repairs and maintenance	8,465,028	3,955,126	2,317,214	-	6,272,340	6,355,983
Materials and supplies	14,194,938	13,492,858	53,979	-	13,546,837	11,601,114
Utilities, permits and taxes	9,317,986	7,635,055	906,011	-	8,541,066	8,807,621
Corporate costs	22,978,942	28,622,413	-	(5,845,916)	22,776,497	20,691,464
Other	8,173,955	7,559,072	733,071	-	8,292,143	8,672,974
Amortization of tangible capital assets	41,245,313	37,890,999	4,935,910	-	42,826,909	41,422,851
Interest on long-term debt	32,210,984	26,453,315	4,746,037	-	31,199,352	29,892,407
	204,781,647	183,640,155	16,088,362	(5,845,916)	193,882,601	184,497,251
Annual surplus	\$ 161,067,416	\$ 176,943,380	\$ 7,118,970	\$ -	\$ 184,062,350	\$ 183,768,729

Financial Statements of

**METRO VANCOUVER
HOUSING CORPORATION**

Year ended December 31, 2022

DRAFT - April 13, 2023

METRO VANCOUVER HOUSING CORPORATION

Index to Financial Statements

December 31, 2022

	Exhibit
Management Report	
Independent Auditor's Report	
Statement of Financial Position	A
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Statement of Change in Net Debt	C
Statement of Cash Flows	D
Notes to Financial Statements	

METRO VANCOUVER HOUSING CORPORATION

MANAGEMENT REPORT

The Financial Statements contained in this report have been prepared by management in accordance with Canadian public sector accounting standards. The integrity and objectivity of these statements are management's responsibility. Management is responsible for all the statements and schedules, and for ensuring that this information is consistent, where appropriate, with the information contained in the financial statements.

Management is also responsible for implementing and maintaining a system of internal controls to provide reasonable assurance that reliable financial information is produced.

The Metro Vancouver Housing Corporation's Board of Directors is responsible for approving the financial statements and for ensuring that management fulfills its responsibilities for financial reporting and internal control and exercises this responsibility through the Finance Committee of the Board.

The external auditors, BDO Canada LLP, conduct an independent examination, in accordance with Canadian generally accepted auditing standards, and express their opinion on the financial statements. Their examination does not relate to the other schedules and statements required by the *Financial Information Act*. The Independent Auditor's Report outlines the scope of the audit for the year ended December 31, 2022.

On behalf of Metro Vancouver Housing Corporation.

Dean Rear, Chief Financial Officer

Date: April 28, 2023

Independent Auditor's Report

To the Board of Directors of the Metro Vancouver Housing Corporation

Opinion

We have audited the financial statements of the Metro Vancouver Housing Corporation (the "Corporation"), which comprise the Statement of Financial Position as at December 31, 2022, and the Statements of Operations, Change in Net Debt and Cash Flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Corporation as at December 31, 2022, and the results of its operations, change in net debt and cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Corporation in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Corporation's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Corporation or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Corporation's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Corporation's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Corporation's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Corporation to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Chartered Professional Accountants

Vancouver, British Columbia
REPORT DATE

METRO VANCOUVER HOUSING CORPORATION

Exhibit A

Statement of Financial Position

As at December 31, 2022

	2022	2021
Financial Assets		
Accounts receivable	\$ 2,742,766	\$ 623,427
Due from Metro Vancouver Regional District	55,984,565	61,528,240
	58,727,331	62,151,667
Liabilities		
Accounts payable and accrued liabilities (note 3)	7,458,181	5,051,559
Deferred revenue and refundable deposits (note 4)	7,163,751	6,535,981
Mortgages and loans payable (note 5)	50,900,959	54,518,957
	65,522,891	66,106,497
Net Debt	(6,795,560)	(3,954,830)
Non-Financial Assets		
Tangible capital assets (note 6)	123,426,386	105,843,374
Prepaid land leases (note 7)	4,867,502	5,062,302
Prepaid expenses	930,027	784,143
	129,223,915	111,689,819
Accumulated surplus (note 8)	\$ 122,428,355	\$ 107,734,989

Contractual obligations (note 9)

Contingencies (note 10)

Budget information (note 11)

Subsequent event (note 12)

The accompanying notes are an integral part of these financial statements.

Director

Director

METRO VANCOUVER HOUSING CORPORATION

Exhibit B

Statement of Operations

Year ended December 31, 2022

	2022 Budget (Note 11)	2022 Actual	2021 Actual
Revenues			
Property rental	\$ 42,050,709	\$ 43,266,817	\$ 42,416,407
Contributions:			
British Columbia Housing Management	1,834,061	1,538,412	1,749,788
Grants and other contributions	17,535,892	1,891,423	120,703
Interest income	1,072,075	1,447,918	655,358
Other revenues	6,639,490	1,176,493	900,466
	69,132,227	49,321,063	45,842,722
Expenses			
Asset repairs and maintenance	20,407,318	14,597,085	16,866,033
Amortization of tangible assets and prepaid land	2,902,673	2,971,035	3,212,445
Utilities, permits, and taxes	4,505,744	4,601,247	4,454,801
Salaries and benefits	6,988,036	6,660,947	6,411,113
Interest and fees on long-term debt	1,527,945	1,294,759	1,265,098
Corporate costs	2,417,247	2,390,454	2,095,291
Consulting, contracted, and professional services	1,173,163	995,466	632,423
Other	1,045,723	911,773	778,431
Materials and supplies	186,451	204,931	168,507
	41,154,300	34,627,697	35,884,142
Annual surplus	27,977,927	14,693,366	9,958,580
Accumulated surplus, beginning of year	107,734,989	107,734,989	97,776,409
Accumulated surplus, end of year	\$ 135,712,916	\$ 122,428,355	\$ 107,734,989

The accompanying notes are an integral part of these financial statements.

METRO VANCOUVER HOUSING CORPORATION

Exhibit C

Statement of Change in Net Debt

Year ended December 31, 2022

	2022 Budget (Note 11)	2022 Actual	2021 Actual
Annual surplus	\$ 27,977,927	\$ 14,693,366	\$ 9,958,580
Change in tangible capital assets			
Acquisition of tangible capital assets	(48,300,000)	(20,493,998)	(5,436,056)
Amortization of tangible capital assets	2,707,874	2,776,235	3,017,646
Disposal of tangible capital assets	—	134,751	—
	(45,592,126)	(17,583,012)	(2,418,410)
Change in other non-financial assets			
Payment of prepaid expenses	—	(930,027)	(784,143)
Use of prepaid expenses	—	784,143	721,541
Amortization of prepaid land leases	194,799	194,800	194,799
	194,799	48,916	132,197
Change in net debt	(17,419,400)	(2,840,730)	7,672,367
Net debt, beginning of year	(3,954,830)	(3,954,830)	(11,627,197)
Net debt, end of year	\$ (21,374,230)	\$ (6,795,560)	\$ (3,954,830)

The accompanying notes are an integral part of these financial statements.

METRO VANCOUVER HOUSING CORPORATION

Exhibit D

Statement of Cash Flows

Year ended December 31, 2022

	2022	2021
Cash provided by (used in):		
Operating transactions:		
Annual surplus	\$ 14,693,366	\$ 9,958,580
Items not involving cash		
Amortization of tangible capital assets	2,776,235	3,017,646
Amortization of prepaid land leases	194,800	194,799
Loss on disposal of tangible capital assets	134,751	—
Change in non-cash assets and liabilities		
Accounts receivable	(2,119,339)	5,602,271
Accounts payable and accrued liabilities	2,406,622	1,161,863
Deferred revenue and refundable deposits	627,770	885,587
Prepaid expenses	(145,884)	(62,602)
Net change in cash from operating transactions	18,568,321	20,758,144
Capital transactions:		
Acquisition of tangible capital assets	(20,493,998)	(5,436,056)
Net change in cash from capital transactions	(20,493,998)	(5,436,056)
Financing transactions:		
Due from Metro Vancouver Regional District	5,543,675	(11,478,558)
Principal repayments on mortgages and loans	(3,617,998)	(3,843,530)
Net change in cash from financing transactions	1,925,677	(15,322,088)
Net change in cash and cash equivalents	—	—
Cash and cash equivalents, beginning of year	—	—
Cash and cash equivalents, end of year	\$ —	\$ —

The accompanying notes are an integral part of these financial statements.

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 1

Year ended December 31, 2022

1. Significant Accounting Policies

The Metro Vancouver Housing Corporation ("MVHC" or the "Corporation") is a wholly-owned subsidiary of the Metro Vancouver Regional District ("MVRD"). The MVHC is incorporated under the Business Corporations Act (British Columbia) as a not-for-profit corporation for the purpose of supplying public rental accommodation, and is exempt from income taxes.

The Corporation's financial statements are prepared by management in accordance with Canadian public sector accounting standards. Significant accounting policies adopted by the MVHC are as follows:

Basis of Accounting

The Corporation follows the accrual method of accounting for revenue and expenses. Revenue is recognized in the year in which they are earned and measurable. Expenses are recognized as they are incurred and measurable as a result of the receipt of goods or services and/or the legal obligation to pay.

Government Transfers

Government transfers are recognized as revenue in the financial statements when the transfer is authorized and any eligibility criteria are met, except to the extent that transfer stipulations give rise to an obligation that meets the definition of a liability. The transfer of revenue is initially deferred and then recognized in the statement of operations as the stipulation liabilities are settled.

When the Corporation is deemed the transferor, the transfer expense is recognized when the recipient is authorized and has met the eligibility criteria.

Deferred Revenue and Refundable Deposits

Deferred revenues represent tenant security deposits, restricted contributions and revenues, and rental income which have been collected, but which the related services or obligations have yet to be performed. These amounts will be recognized as revenues in the fiscal year the services are performed or obligations have been met.

Amounts received under the following programs have been recorded as deferred revenue:

- i) Rental Operations: Under operating agreements entered into with Canada Mortgage and Housing Corporation ("CMHC") and administered by BC Housing Management Commission ("BCHMC") (Homes BC, Seniors, and Investment in Housing Innovation properties), a portion of the funds received from rental operations are restricted and can only be used by MVHC according to the terms of the agreements. Restricted amounts are recorded as deferred revenue and are used when expenditures exceed revenue in the program.

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 2

Year ended December 31, 2022

1. Significant Accounting Policies (continued)

Deferred Revenue and Refundable Deposits (continued)	ii) Replacement Projects: Under operating agreements entered into with Canada Mortgage and Housing Corporation ("CMHC") and administered by BCHMC (Homes BC, Seniors, and Investment in Housing Innovation properties), a portion of the funds received from rental operations are restricted for the replacement of equipment and specified building components. These funds are deferred until spent on approved items.
Interest Income	Interest income is reported as revenue in the period earned. When required, based on external requirements, interest income earned on deferred revenue and refundable deposits is added to and forms part of the deferred revenue and refundable deposit balance.
Cash and Investments	In order to improve cash management, the MVRD holds cash and investment transactions in pooled accounts on behalf of its four legal entities: the Metro Vancouver Regional District, the Greater Vancouver Sewerage and Drainage District, the Greater Vancouver Water District, and the Metro Vancouver Housing Corporation. The Corporation's cash is therefore presented as due from MVRD. Investments held by the MVRD consist of bonds issued by governments and Canadian chartered banks, money market instruments, guaranteed investment certificates, and term deposits. Interest earned on the Corporation's fund balances is included in the amount owing from MVRD and is recorded as interest income in the Statement of Operations.
Employee Future Benefits	<p>Employees who provide services for MVHC are employees of the MVRD. Employee related costs are allocated by the MVRD to MVHC based on services rendered. These costs are shown as expenses in the financial statements and are included in amounts owing from MVRD.</p> <p>Post-employment benefits of the MVRD, including accumulated banked sick and vacation pay, retirement severance, and Worker's Compensation top-up benefits for employees pursuant to certain policies and union agreements, are actuarially determined based on service and best estimates of retirement ages and expected future salary and wage increases. The obligation under these benefit plans is allocated to MVHC based on projected benefits as the employees render services necessary to earn the future benefits and included in amounts owing to the MVRD.</p>

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 3

Year ended December 31, 2022

1. Significant Accounting Policies (continued)

Non-financial assets

Non-financial assets are not available to discharge existing liabilities and are held for use in the provision of services. They have useful lives extending beyond the current year and are not intended for sale in the ordinary course of operations.

Tangible Capital Assets

Tangible capital assets are recorded at cost, which includes amounts that are directly attributable to acquisition, construction, development, or betterment of the asset. The cost, less residual value, of the tangible capital assets, excluding land, is amortized on a straight-line basis over the estimated useful lives of the assets as follows:

Asset	Useful Life - Years
Buildings	
Manor House and Regal Hotel	25
Other buildings	35
Furniture and fixtures	6 - 10

1) Annual amortization:

Annual amortization begins when the asset is available for use and is expensed over its useful life. Assets under construction are transferred to the appropriate asset class and are amortized from the date the asset is available for use.

2) Interest capitalization:

The Corporation does not capitalize interest costs associated with the acquisition or construction of a tangible capital asset.

Prepaid Land Leases

Prepaid land leases are recorded at historical cost less accumulated amortization. Upon expiration of the lease contract, the property will revert to the lessor. Prepaid land leases are amortized on a straight-line basis over the lease term.

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 4

Year ended December 31, 2022

1. Significant Accounting Policies (continued)

Financial Instruments

Financial instruments are recorded at fair value on initial recognition.

Unrealized changes in fair value are recognized in the Statement of Remeasurement Gains and Losses until they are realized, when they are transferred to the Statement of Operations.

Financial instruments are adjusted by transaction costs incurred on acquisition and financing costs, which are amortized using the straight-line method.

All financial assets are assessed for impairment on an annual basis. When a decline is determined to be other than temporary, the amount of the loss is reported in the Statement of Operations and any unrealized gain is adjusted through the Statement of Remeasurement Gains and Losses.

When the asset is sold, the unrealized gains and losses previously recognized in the Statement of Remeasurement Gains and Losses are reversed and recognized in the Statement of Operations.

There are no financial instruments carried at fair value as at year end and as a result, the Statement of Remeasurement Gains and Losses has not been prepared.

Functional and Segmented Presentation of Revenue and Expenses

A segment is defined as a distinguishable activity or group of activities of a government for which it is appropriate to separately report financial information to achieve the objectives of the standard. Management believes that MVHC's activities are comprised of only one segment and hence no additional disclosure is required. Furthermore, as the operations of MVHC are comprised of a single function, supply of public rental accommodation, the Statement of Operations presents revenue and expenses by object.

Revenue Recognition

Property rental income, contributions, and other revenues are recognized as revenue on an accrual basis. Housing property rental revenue is recognized over the rental period once the tenant commences occupancy, rent is due and collection is assured. Annual property rental increases are based on rates established by provincial tenancy legislation. Contributions from CMHC and BCHMC are based on provisions set in agreements and outlined in note 2.

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 5

Year ended December 31, 2022

1. Significant Accounting Policies (continued)

Liability for Contaminated Sites

A liability for remediation of a contaminated site is recognized when the site is no longer in productive use and the following criteria are satisfied; an environmental standard exists; contamination exceeds the standard; MVHC is either directly responsible or has accepted responsibility for remediation; it is expected that future economic benefits will be given up and a reasonable estimate of the liability can be made.

Use of Estimates

The preparation of these financial statements requires management to make estimates and assumptions that affect the reported amounts and disclosure of contingent liabilities, in the financial statements. These estimates and assumptions are based on management's best information and judgment and may differ from actual results. Adjustments, if any, will be reflected in the financial statements in the period that the change in estimate is made, as well as in the period of settlement if the amount is different.

Significant areas requiring the use of management's judgment relate to the determination of contaminated sites liabilities, the amortization rates of tangible capital assets and the assessment of the outcome of contingent liabilities.

2. Senior Government Assistance

BCHMC is the administrator and provides the related government assistance for all of MVHC's Federal programs and Provincial operating agreements (Homes BC, Seniors, and Investment in Housing Innovation properties). In 2007, CMHC devolved its operations relating to the MVHC's federal programs to BCHMC, which provides BCHMC with the authority to manage MVHC's federal programs.

Details of senior government assistance are as follows:

CMHC mortgage insurance

Pursuant to Section 6 of the *National Housing Act* ("NHA"), CMHC has undertaken to insure mortgages payable by the MVHC.

NHA Section 82.1(a) and 82.1(b) subsidy

Rental supplements are authorized under Section 82.1(a) and 82.1(b) of the NHA and are funded jointly by BCHMC on behalf of the both the Federal Government and the Province of British Columbia.

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 6

Year ended December 31, 2022

3. Accounts Payable and Accrued Liabilities

	2022	2021
Trade accounts	\$ 6,185,191	\$ 4,649,286
Construction holdbacks	1,191,181	314,806
Accrued interest on mortgages and debenture debt	81,809	87,467
	\$ 7,458,181	\$ 5,051,559

4. Deferred Revenue and Refundable Deposits

	2022	2021
Externally restricted funds for programs under BCHMC Agreements:		
Rental operations	\$ 48,464	\$ 47,320
Replacement provisions	3,456,305	3,375,308
	3,504,769	3,422,628
MVHC tenant security deposits	2,156,638	2,097,391
Rent and subsidies received in advance	365,561	394,878
Grant received in advance	1,136,783	621,084
Total	\$ 7,163,751	\$ 6,535,981

	2022	2021
Balance, beginning of year	\$ 6,535,981	\$ 5,650,394
Contributions received	1,034,628	1,419,568
Contributions earned	(436,788)	(667,784)
Change in security deposits and prepaid rents	29,930	133,803
	627,770	885,587
Balance, end of year	\$ 7,163,751	\$ 6,535,981

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 7

Year ended December 31, 2022

5. Mortgages and Loans Payable

- a) MVHC's loans for Cedarwood, Crown Manor, Earle Adams, Euclid Square, Grandview Gardens, Kelly Court, Manor House, Regal Hotel and Semlin Terrace are financed through the MVRD at MVRD's internal variable rate which was 1.70% in 2022 (2021 - 1.30%). Financing arrangements are approved through the Boards of MVRD and MVHC and renewed every 5 years. There are no charges or liens on these properties.
- b) Mortgages and loans outstanding (see note 5(d)) are expected to be renegotiated on a long-term basis. Annual principal repayments assuming extension to maturity are as follows:

	Payments for		Payments for		Total
	MVRD		Mortgages		Payments
	Loans				
2023	\$	923,583	\$	2,604,471	\$ 3,528,054
2024		923,583		2,654,964	3,578,547
2025		923,583		2,721,853	3,645,436
2026		923,583		2,790,528	3,714,111
2027		923,583		2,741,515	3,665,098
Thereafter		3,636,519		29,133,194	32,769,713
Total	\$	8,254,434	\$	42,646,525	\$ 50,900,959

- c) Properties funded by BCHMC mortgages are collateralized by a general assignment of rents and the benefit of all covenants and agreements included in any lease.
- d) Mortgages and loans are comprised of the following and includes varying maturities up to 2055 with interest rates ranging from 1.44% to 4.87%.

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 8

Year ended December 31, 2022

5. Mortgages and Loans Payable (continued)

Rental Property	Financed by	Interest Rate - %	Renewal Date	Expected Maturity Date	2022	2021
Investment in Housing Innovation Projects:						
Heather Place A	Other	1.44	December 1, 2030	December 1, 2055	\$ 12,739,503	\$ 13,039,238
Total Investment in Housing Innovation projects					12,739,503	13,039,238
Seniors projects:						
Alderwood Place	CHMC	2.55	—	July 1, 2027	1,236,421	1,487,817
Cedarwood Place	CHMC	2.39	—	January 1, 2023	14,037	179,732
Cedarwood Place	MVRD	1.70	July 1, 2024	July 1, 2038	3,302,389	3,508,789
Total Seniors projects					4,552,847	5,176,338
Homes BC projects:						
Chateau de Ville	Other	4.87	July 1, 2027	July 1, 2035	6,471,833	6,840,730
Claude Douglas	Other	2.56	November 1, 2029	November 1, 2036	1,744,214	1,847,421
Fraserwood	Other	1.44	December 1, 2030	December 1, 2035	2,880,070	3,080,169
Inlet Centre	Other	1.58	October 1, 2030	October 1, 2038	4,907,839	5,178,448
Maplewood	Other	2.62	May 1, 2027	May 1, 2037	2,205,283	2,329,800
Odlinwood	Other	2.03	August 1, 2026	August 1, 2036	4,099,335	4,357,318
Total Homes BC projects					22,308,574	23,633,886
MVHC projects:						
Crown Manor	MVRD	1.70	July 15, 2024	July 15, 2038	610,534	649,208
Earle Adams Village	MVRD	1.70	June 1, 2022	June 1, 2027	1,325,352	1,590,405
Euclid Square	MVRD	1.70	June 1, 2022	June 1, 2027	389,321	467,186
Grandview Gardens	MVRD	1.70	June 1, 2022	June 1, 2027	277,849	333,419
Kelly Court	MVRD	1.70	June 1, 2022	June 1, 2027	551,387	661,665
Manor House	MVRD	1.70	March 15, 2024	March 15, 2038	1,023,571	1,088,218
Meridian Village	Other	2.46	September 1,	July 1, 2031	3,990,636	4,403,694
Minato West	Other	2.22	October 1, 2021	October 1, 2031	2,357,354	2,596,594
Regal Place Hotel	MVRD	1.70	March 15, 2024	March 15, 2038	363,415	386,367
Semlin Terrace	MVRD	1.70	June 1, 2022	June 1, 2027	410,616	492,739
Total MVHC projects					11,300,035	12,669,495
Total mortgages and loans payable					\$ 50,900,959	\$ 54,518,957
Mortgages and loans payable consists of:						
Loans payable to MVRD					\$ 8,254,434	\$ 9,177,996
Mortgages payable to CMHC and financial institutions					42,646,525	45,340,961
Total mortgages and loans payable					\$ 50,900,959	\$ 54,518,957

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 9

Year ended December 31, 2022

6. Tangible Capital Assets

Year ended December 31, 2022

	Cost				Accumulated Amortization				Net Book Value December 31, 2022
	Balance at December 31, 2021	Additions	Disposals	Balance at December 31, 2022	Balance at December 31, 2021	Disposals	Amortization Expense	Balance at December 31, 2022	
Land	\$ 52,274,381	\$ —	\$ —	\$ 52,274,381	\$ —	\$ —	\$ —	\$ —	\$ 52,274,381
Buildings	220,339,606	3,250,133	—	223,589,739	176,544,478	—	2,289,708	178,834,186	44,755,553
Furniture & fixtures	6,439,458	618,571	(496,915)	6,561,114	4,742,709	(362,164)	486,527	4,867,072	1,694,042
Construction in progress	8,077,116	16,625,294	—	24,702,410	—	—	—	—	24,702,410
	\$ 287,130,561	\$ 20,493,998	\$ (496,915)	\$ 307,127,644	\$ 181,287,187	\$ (362,164)	\$ 2,776,235	\$ 183,701,258	\$ 123,426,386

Year ended December 31, 2021

	Cost				Accumulated Amortization				Net Book Value December 31, 2021
	Balance at December 31, 2020	Additions	Disposals	Balance at December 31, 2021	Balance at December 31, 2020	Disposals	Amortization Expense	Balance at December 31, 2021	
Land	\$ 52,274,381	\$ —	\$ —	\$ 52,274,381	\$ —	\$ —	\$ —	\$ —	\$ 52,274,381
Buildings	220,575,387	(235,781)	—	220,339,606	174,053,428	—	2,491,050	176,544,478	43,795,128
Furniture & fixtures	6,463,268	479,849	(503,659)	6,439,458	4,719,772	(503,659)	526,596	4,742,709	1,696,749
Construction in progress	2,885,128	5,191,988	—	8,077,116	—	—	—	—	8,077,116
	\$ 282,198,164	\$ 5,436,056	\$ (503,659)	\$ 287,130,561	\$ 178,773,200	\$ (503,659)	\$ 3,017,646	\$ 181,287,187	\$ 105,843,374

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 10

Year ended December 31, 2022

7. Prepaid Land Leases

	2022	2021
Balance, beginning of year	\$ 5,062,302	\$ 5,257,101
Amortization	(194,800)	(194,799)
Balance, end of year	\$ 4,867,502	\$ 5,062,302

The lease terms for the properties are as follows:

Asset	Lease Expiry Dates	Lease Term (Years)
Buildings		
Habitat Villa	February 2029	50
Walnut Gardens	May 2026	42
Other prepaid land leases	May 2036 to June 2062	60

8. Accumulated Surplus

Accumulated surplus consists of authorized and issued 2,000 common shares with a par value of \$1 per share and individual fund surplus and reserves as follows:

	2022	2021
Reserves	\$ 55,075,513	\$ 51,346,270
Capital fund	(5,174,585)	5,062,302
Investment in tangible capital assets	72,525,427	51,324,417
Share capital	2,000	2,000
	\$ 122,428,355	\$ 107,734,989

Continuity of reserves is as follows:

	2022	2021
Balance, beginning of year	\$ 51,346,270	\$ 47,454,831
Interest	1,133,900	535,652
Contribution to operations	(2,414,053)	(7,075,873)
Contribution to capital	(5,300,000)	(4,859,212)
Annual operating surplus	10,309,396	15,290,872
	\$ 55,075,513	\$ 51,346,270

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 11

Year ended December 31, 2022

8. Accumulated Surplus (continued)

Investment in tangible capital assets is calculated as follows:

	2022	2021
Tangible capital assets	\$ 123,426,386	\$ 105,843,374
Amounts financed by:		
Long-term debt	(50,900,959)	(54,518,957)
	\$ 72,525,427	\$ 51,324,417

The change in investment in tangible capital assets is as follows:

	2022	2021
Change in the investment in tangible capital assets		
Acquisition of tangible capital assets	\$ 20,493,998	\$ 5,436,056
Amortization of tangible capital assets	(2,776,235)	(3,017,646)
Disposal of tangible capital assets (net of book value)	(134,751)	—
	17,583,012	2,418,410
Less financing of tangible capital assets through debt		
Payment of long-term debt	(3,617,998)	(3,843,530)
	(3,617,998)	(3,843,530)
Change in investment in tangible capital assets	21,201,010	6,261,940
Investment in tangible capital assets, beginning of year	51,324,417	45,062,477
Investment in tangible capital assets, end of year	\$ 72,525,427	\$ 51,324,417

9. Contractual Obligations

a) Contractual Obligations

- i) As at December 31, 2022, the Corporation had the following commitments relating to projects in progress.

Authorized and Outstanding Projects	Expended at December 31	Total 2022	Total 2021
\$ 322,500,000	\$ (24,106,220)	\$ 298,393,780	\$ 346,322,885

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 12

Year ended December 31, 2022

10. Contingencies

Lawsuits

As at December 31, 2022, there were various lawsuits pending against the Corporation arising in the ordinary course of business. The Corporation has retained legal counsel to defend against these lawsuits. Where the outcomes or amounts cannot be reasonably determined, no liability has been recorded. Management is of the opinion that losses, if any, in connection with these lawsuits can be sufficiently funded by reserve funds or covered by insurance. Any expected losses will be accrued and recorded as expenses at the time they are considered likely and amounts are reasonably determinable.

Self-Insurance Reserve

A self-insurance reserve has been established within the MVRD to cover losses resulting from uninsured liability exposures of the Metro Vancouver Districts, and the MVHC.

Each year a review is undertaken to determine if it would be beneficial to purchase liability insurance. The MVRD, its related Districts, and the MVHC transfer amounts to the reserve depending on the reserve's adequacy to cover retained liability risk.

An estimate is made for all costs of investigating and settlement of claims incurred annually and an adjustment is made to the reserve to maintain an adequate balance to cover potential losses in excess of recorded liabilities. These adjustments are changed as additional information becomes known during the course of claims settlement. Any likely losses would be expensed by at the time the losses are known and the amounts are reasonably determinable.

BC Homes Repayable Assistance

Under the operating agreements, the cumulative Non-Rent Geared to Income (Non-RGI) assistance is contingently repayable to BCHMC in the event that BCHMC's unit rent contribution for any unit exceeds the economic or breakeven rent of the units occupied by Non-RGI tenants in any year. MVHC is required to commence repayment of the cumulative Non-RGI assistance on the first day of the fiscal year following the fiscal year in which the preceding event occurs. The balance then bears interest at bank prime and the required monthly payments are set annually based upon the amount by which Non-RGI BCHMC's unit rent contributions exceed economic rent for these units in the prior year. Currently the estimated total Repayable Assistance at December 31, 2022 is \$nil (2021 - \$nil). However, the balance will be reconciled and finalized once BCHMC completes the financial review for the fiscal year ended December 31, 2022.

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 13

Year ended December 31, 2022

10. Contingencies (continued)

BCHMC Grant Funding

In 2018 MVHC entered into a forgivable loan agreement (the "Agreement") with BC Housing Management Commission for funding for the Heather Place Facility. MVHC received funding in the amounts of \$5,137,797 and \$1,547,723 in 2018 and 2019, respectively. The loan term is 35 years and is forgivable in the amount of 1/25th of the final balance of \$6,685,520 commencing in the 11th year after completion of construction and commencement of operations, which occurred in 2020. Upon commencement of operations of the facility, the amount of funding received was recorded as revenue from government transfer as the remaining stipulation of continuing to operate the facility in accordance with the Agreement is not considered to create a liability.

Forgiveness of the loan under the Agreement requires that the property must be continuously used for the provision of housing for eligible occupants and there is no default under the loan or operating agreement. Should a breach in the agreement occur, the outstanding balance of the funding not previously forgiven would need to be repaid to BCHMC immediately. Payments of interest will not be required unless there is a default, which would result in interest being payable on the unforgiven balance of the principal amount then outstanding at prime plus 2% per annum, compounded semi-annually and not in advance. As management does not consider it likely that the amount will be repaid, no liability is recorded in the financial statements.

CMHC Grant Funding

In 2022 MVHC entered into an agreement with the Canada Mortgage and Housing Corporation for funding for the repair of the Kelly Court Facility, totalling \$1,321,824. As of December 31, 2022, \$1,182,147 of the grant was expended and recorded as grant revenue and accounts receivable. Stipulations of the grant agreement requires that MVHC maintain the affordability of the building for eligible occupants, that the project meets minimum energy efficiency requirements and that there is no default under the funding agreement. Should a breach in the agreement occur, the contribution, in whole or part, would be repayable to CMHC immediately. As management does not consider it likely that the amount will be repaid, no liability is recorded in the financial statements.

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 14

Year ended December 31, 2022

10. Contingencies (continued)

BCHMC Loan Funding

In 2022, MVHC entered into a demand non-revolving construction loan agreement with BC Housing Management Commission for funding for the Kingston Gardens re-development project. The maximum approved construction loan amount is \$44,642,752. Amounts drawn from the loan must be repaid no later than August 1, 2024. The BCHMC construction loan is to be repaid by a BCHMC investment of \$8,300,000 and take-out mortgage obtained through CMHC's National Housing Co-Investment Fund for \$29,411,377. Any amounts remaining of up to \$6,931,375, will be paid from MVHC's reserves.

Interest payable on the loan will be calculated based on a variable rate of not more than the Royal Bank of Canada Prime Rate plus 1.00%, compounded monthly, not in advance. As at December 31, 2022, no amounts were drawn from the demand loan.

11. Budget Information

The annual budget presented in these financial statements is based upon the 2022 operating and capital budgets approved by the Corporation's Board in October 2021. The budget is based on operational and capital expenditure requirements and their associated funding. Amortization is a non-cash item that is not funded for budget purposes. Contributions to or from reserves and debt principal repayments are removed from the approved budget for financial statement presentation. The schedule below reconciles the approved budget to the budget figures reported in these financial statements. Capital expenditures of \$48,300,000 were included in the Capital Budget approved by the Board.

	2022 Budget	2021 Budget
Budgeted annual surplus per Exhibit B	\$ 27,977,927	\$ 12,739,949
Items not included in the operating budget		
Amortization of tangible capital assets and prepaid land	2,902,673	2,108,764
Reserve interest	(1,007,075)	(942,813)
Development grant	(17,535,892)	(8,500,000)
Items included in the budget but not in financial statements		
Debt principal payments	(3,952,669)	(3,564,408)
Transfers to reserves	(8,384,964)	(1,841,492)
Annual surplus per approved budget	\$ —	\$ —

METRO VANCOUVER HOUSING CORPORATION

Notes to Financial Statements, page 15

Year ended December 31, 2022

12. Subsequent Event

On April 12, 2023, the MVHC entered into a three-year memorandum of understanding with the Province of British Columbia, through the BCHMC, to provide \$158 million in funding to the MVHC over the next three years for the construction of approximately 660 new homes at five of the MVHC sites.

To: GVWD Board of Directors

From: Dean Rear, Chief Financial Officer

Date: April 13, 2023 Meeting Date: April 28, 2023

Subject: **GVWD Water Development Cost Charge Bylaw 257, 2022 and GVWD Water Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw 256, 2022**

RECOMMENDATION

That the GVWD Board:

- a) pass and finally adopt *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022*; and
 - b) give third reading to the *Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022* as amended and presented in the report dated April 13, 2023; and
 - c) pass and finally adopt *Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022* as amended and presented in the report dated April 13, 2023
-

EXECUTIVE SUMMARY

On January 27, 2023 the Greater Vancouver Water District Board (GVWD) gave a third reading as amended to the *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022* and subsequently sent the Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022 to the Inspector of Municipalities, which received approval in March 2023. Accompanying this bylaw is the adoption of the *Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw 256, 2022*.

Significant engagement with industry, member jurisdictions, First Nations and the public was undertaken in the Summer 2022 in which feedback and comments were received and addressed. It is recommended that the GVWD Board adopt the *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022* and the *Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022*.

PURPOSE

To adopt *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022* that has received its certificate of approval from the Inspector of Municipalities and to adopt the *Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022*.

BACKGROUND

In the 2019–2022 Board Strategic Plan, the Metro Vancouver Board included a commitment to pursue the adoption of water DCCs with the purpose of ensuring new development in the region

fund or partially fund the cost of water infrastructure expansion required to service that development. As part of the plan to implement a water DCC, staff initiated development of a water DCC in 2020.

At the January 27, 2023 meeting, the GVWD Board gave a third reading as amended to *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022* (Attachment 1) and it was subsequently forwarded to the Inspector of Municipalities for approval. The certificate of Statutory Approval (Attachment 2) was signed on March 10, 2023.

The *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022* is structured with the following:

- The rates as calculated to finance the growth capital program with the inclusion of interest; and
- An effective date of upon the adoption of the bylaw.

In addition, the *Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022* is included to provide waivers or reductions of DCCs for not-for-profit rental housing. This bylaw is structured to be essentially aligned with the *Greater Vancouver Sewerage and Drainage District Development Cost Charge Waiver for Affordable Housing Bylaw, No. 314, 2018*.

ALTERNATIVES

1. That the GVWD Board:
 - a) pass and finally adopt *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022*; and
 - b) give third reading to the *Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022* as amended and presented in the report dated April 13, 2023; and
 - c) pass and finally adopt *Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022* as amended and presented in the report dated April 13, 2023
2. That the GVWD Board receive for information the report dated April 13, 2023, titled “GVWD Water Development Cost Charge Bylaw No. 257, 2022 and GVWD Water Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022” and provide alternate direction.

FINANCIAL IMPLICATIONS

Details of the DCC rate structure are summarized in Attachment 1 within Schedule A. The completion of water infrastructure necessary to meet the needs of growth in the region is predicated on the collection of funding from growth to pay for it when required. The proposed rates with the inclusion of interest sets a path to fund growth capital infrastructure from DCCs.

CONCLUSION

GVWD *Development Cost Charge Bylaw No. 257, 2022* has received Statutory Approval from the Inspector of Municipalities. Final adoption by the GVWD Board is required to approve the bylaw and implement the new rates effective upon adoption of the bylaw. Furthermore, as part of the implementation of the Water DCC program and to ensure consistency with the Liquid Waste DCC program, adoption of the *Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022* is required. Staff recommend alternative 1.

Attachments

1. *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022*
2. *Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022*
3. Statutory Approval dated March 10, 2023

58950518

**GREATER VANCOUVER WATER DISTRICT
BYLAW NO. 257, 2022
A Bylaw to impose Development Cost Charges**

WHEREAS:

- A. Pursuant to the *Local Government Act* (“the Act”), the Greater Vancouver Water District (“the GVWD”), as a greater board, may, by bylaw, impose development cost charges on every person who obtains approval of a subdivision or a building permit authorizing the construction, alteration or extension of a building or structure from a Member Municipality;
- B. Development cost charges provide funds to assist the GVWD in paying capital costs including interest costs directly related to those activities that are approved by the Inspector of Municipalities to be included as capital cost, incurred to provide, construct, alter or expand water facilities to service, directly or indirectly, the development for which the charge is being imposed;
- C. Pursuant to the Act, development cost charges are not payable in certain circumstances and the GVWD may waive or reduce development cost charges for eligible developments;
- D. Member Municipalities collect the development cost charges imposed under this Bylaw and remit them to the GVWD;
- E. In setting development cost charges under this Bylaw, the GVWD has considered:
 - (a) future land use patterns and development;
 - (b) the phasing of works and services;
 - (c) the provision of park land described in an official community plan;
 - (d) how development designed to result in a low environmental impact may affect the capital costs of infrastructure referred to in sections 559(2) and (3) of the Act;
 - (e) whether the charges are excessive in relation to the capital cost of prevailing standards of service in the municipality or regional district;
 - (f) whether the charges will, in the municipality or regional district,
 - (i) deter development,
 - (ii) discourage the construction of reasonably priced housing or the provision of reasonably priced serviced land, or
 - (iii) discourage development designed to result in a low environmental impact.

NOW THEREFORE the Board of the Greater Vancouver Water District enacts as follows:

1.0 Citation

- 1.1 The official citation of this bylaw is “Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022”. This bylaw may be cited as the “GVWD Development Cost Charge Bylaw”.

2.0 Schedule

- 2.1 The following Schedule is attached to and forms part of the bylaw:
Schedule “A”, GVWD Development Cost Charge Rates;

3.0 Definitions

- 3.1 In this Bylaw:

“Apartment Dwelling Unit” means a Dwelling Unit in a building or structure that consists or may consist of two or more storeys and contains or may contain four or more Dwelling Units, whereby the building or structure has a principal exterior entrance used in common for access to the Dwelling Units. Apartment Dwelling Unit does not include Dwelling Units that are Townhouse Dwelling Units;

“Building Permit” means any permit required by a Member Municipality that authorizes the construction, alteration or extension of a building or structure;

“Combination Development” means any Development that comprises two or more of the following uses:

- (a) Apartment Dwelling Unit;
- (b) Residential Lot Development Unit;
- (c) Townhouse Dwelling Unit; and
- (d) Non-Residential Use;

“Community Charter” means the *Community Charter*, SBC 2003, c. 26;

“Development” means:

- (a) a Subdivision; or
- (b) the construction, alteration or extension of a building or structure for which a Building Permit is obtained;

“Dwelling Unit” means one or more rooms comprising a self-contained unit that is used or intended to be used for living and sleeping purposes and for which are provided cooking facilities, or the facilities for installation of cooking facilities, and one or more bathrooms having a sink or wash-basin, a water closet, and a shower or bath;

“Floor Area” means:

- (a) the floor area of the building or structure (measured from the outside edge of all exterior walls of the building or structure), less the number of square feet of the floor area of the building or structure that is used or is intended to be used for the parking of motor vehicles and the storage of bicycles; or
- (b) in the case of an alteration or extension of less than the entire building or structure, the portion of the building or structure to which the Building Permit applies (measured from the outside edge of any exterior walls in such portion of the building or structure), less the number of square feet of the floor area of the building or structure that is used or is intended to be used for the parking of motor vehicles and the storage of bicycles;

“Greater Vancouver Water District” or “GVWD” means the Greater Vancouver Water District which is incorporated pursuant to the *Greater Vancouver Water District Act, SBC 1924, c. 22*;

“Land Title Act” means the *Land Title Act*, RSBC 1996, c.250;

“Laneway House” has the definition ascribed to such term in the bylaws of the Member Municipality where the laneway house is located, or, in the absence of such a definition, means a detached building or structure containing one Dwelling Unit and constructed in the yard of a site on which is situate a Single Family Residential Dwelling;

“Local Government Act” means the *Local Government Act*, RSBC 1996, c. 323;

“Member Municipality” means a municipality that is a member of the GVWD;

“Minister” means the member of the Executive Council appointed under the Constitution Act charged by order of the Lieutenant Governor in Council with the administration of the Local Government Act;

“Municipal Charges” means development cost charges imposed by a Member Municipality under either the *Local Government Act*, *Community Charter* or the *Vancouver Charter*;

“Non-Residential Use” means any building or structure or any portion of any building or structure that is not Apartment Dwelling Unit, Residential Lot Development Unit or Townhouse Dwelling Unit but for greater certainty, does not include any portion of any Residential Use building or structure that is not part of a Dwelling Unit and is used or is intended to be used solely for the purpose of gaining access to and from Dwelling Units, solely for the maintenance of the building or structure or solely by the occupants of the Dwelling Units in the building or structure;

“Parcel” means any lot, block or other area in which land is held or into which it is legally subdivided and for greater certainty, without limiting the foregoing, including a strata lot under the *Strata Property Act*;

“Rate Schedule” means the schedule of development cost charge rates that is attached as Schedule A to this Bylaw;

“Rent” means money paid or agreed to be paid, or value or a right given or agreed to be given, by or on behalf of a tenant to a landlord in return for the right to rent a Dwelling Unit, for the use of common areas and for services or facilities and includes any and all strata fees, regardless of whether such fees are paid directly to the landlord, but does not include any of the following:

- (a) a security deposit;
- (b) a pet damage deposit;
- (c) a fee prescribed under section 97 (2) (k) of the *Residential Tenancy Act*;

“Residential Lot Development Unit” means a Dwelling Unit on a lot (not including an Apartment Dwelling Unit or a Townhouse Dwelling Unit) but, if the Dwelling Unit is a Single Family Residential Dwelling, also includes:

- (a) the construction, alteration or extension of a building or structure for up to one Secondary Suite in the Single Family Residential Dwelling,
- (b) the construction, alteration or extension of up to one Laneway House, or
- (c) both.

“Residential Tenancy Act” means the *Residential Tenancy Act*, SBC 2002, c. 78;

“Residential Use” means Apartment Dwelling Unit, Residential Lot Development Unit and Townhouse Dwelling Unit;

“Secondary Suite” has the definition ascribed to such term in the bylaws of the Member Municipality where the secondary suite is located, or, in the absence of such a definition, means the smaller Dwelling Unit contained within a Single Family Residential Dwelling;

“Single Family Residential Dwelling” means a detached building or structure that contains one principal Dwelling Unit and may contain one smaller Dwelling Unit;

“Strata Property Act” means the *Strata Property Act*, SBC 1998, c. 43;

“Subdivision” includes a division of land into two or more Parcels, whether by plan, apt descriptive words or otherwise under the *Land Title Act* or the *Strata Property Act*, the consolidation of two or more Parcels of land, and phased strata plans;

“Townhouse Dwelling Unit” means a Dwelling Unit in a building or structure that contains or may contain four or more Dwelling Units, whereby each Dwelling Unit has a direct exterior entrance;

“Vancouver Charter” means the *Vancouver Charter*, SBC 1953, c. 55;

“Water Facility” means any work, service or plant of the GVWD for acquiring, supplying, or distributing water;

4.0 Development Cost Charges

4.1 Application of Development Cost Charges. Subject to section 4.2, every person who obtains:

- (a) approval of a Subdivision from a Member Municipality; or
- (b) a Building Permit from a Member Municipality;

must pay the applicable development cost charges set out in this Bylaw to that Member Municipality on behalf of the GVWD prior to the approval of the Subdivision or the issuance of the Building Permit.

4.2 Exemptions from Development Cost Charges. Development cost charges are not payable under this Bylaw if:

- (a) the Development is not and will not be capable of being serviced by a Water Facility of the GVWD or by a Water Facility of a Member Municipality that is connected to a Water Facility of the GVWD;
- (b) the Development will not impose new capital cost burdens on the GVWD;
- (c) a development cost charge has previously been paid for the same Development unless, as a result of further Development, new capital cost burdens will be imposed on the GVWD;
- (d) the Building Permit authorizes the construction, alteration or extension of a building or structure or part of a building or structure that is, or will be, after the construction, alteration or extension, exempt from taxation under subsection 220(1)(h) of the *Community Charter*;
- (e) the value of the work authorized by the Building Permit does not exceed \$50,000 or such other amount which the Minister may prescribe by regulation; or

- (f) the Building Permit authorizes the construction, alteration or extension of self-contained Dwelling Units in a building in which:
 - (i) each Dwelling Unit is no larger in area than 29 square metres [312.153 square feet]; and
 - (ii) each Dwelling Unit is to be put to no use other than Residential Use in those Dwelling Units.

4.3 **Calculation of Development Cost Charges.** Development cost charges imposed under this Bylaw will be calculated in accordance with the rates set out in the Rate Schedule. The rates set out in the Rate Schedule may be different in relation to one or more of the following:

- (a) different zones or different defined or specified areas;
- (b) different uses;
- (c) different capital costs as they relate to different classes of Development; or
- (d) different sizes or different numbers of lots or units in a Development.

4.4 **Combination Development.** Without restricting the generality of section 4.3, the development cost charges for a Combination Development will be calculated separately for the portion of the Combination Development attributable to each of Apartment Dwelling Unit, Residential Lot Development Unit, Townhouse Dwelling Unit and Non-Residential Use and will be the sum of the development cost charges for each such use, calculated according to the Rate Schedule.

4.5 **Payment, Collection and Remittance of Development Cost Charges.** Development cost charges imposed under this Bylaw must be paid to the Member Municipality of the GVWD approving the Subdivision or issuing the Building Permit, as the case may be, as follows:

- (a) at the same time as any Municipal Charges as may be levied on the Development under a bylaw of the Member Municipality are payable to the Member Municipality; or
- (b) if no Municipal Charges will be levied on the Development under a bylaw of the Member Municipality, as follows:
 - (i) where an application is made only for Subdivision, prior to the issuance of the approval of the Subdivision by the Member Municipality; or

- (ii) where an application is made only for a Building Permit or for both Subdivision and for a Building Permit, prior to the issuance of the Building Permit by the Member Municipality.

4.6 **Payment of Development Cost Charges by Instalments.** The development cost charges imposed under this Bylaw may not be paid by instalments unless a regulation under subsection 559(5) of the *Local Government Act* applies to the Development and authorizes the payment of development cost charges in instalments.

5.0 **Collection and Remittance of Development Cost Charges**

5.1 **Collection of Development Cost Charges by Member Municipalities.** Each Member Municipality must:

- (a) collect the development cost charges imposed on a Development under this Bylaw; and
- (b) not issue approval of a Subdivision or issue a Building Permit for any Development unless the development cost charges imposed under this Bylaw have been paid in accordance with Part 4.0.

5.2 **Separate Account.** Each Member Municipality must establish and maintain a separate account for the development cost charge monies collected under this Bylaw and deposit and hold these monies in that separate account, in trust for the GVWD, until the monies are remitted to the GVWD under section 5.3

5.3 **Remittance of Development Cost Charges by Municipalities.** Each Member Municipality, within 30 days after June 30 and December 31 of each year, must remit to the GVWD the total amount of development cost charges collected by the Member Municipality under this Bylaw during the six-month period previous to such date, or an amount equal to such development cost charges if the Member Municipality did not collect development cost charges under this Bylaw, together with the statement referred to in section 5.4.

5.4 **Statements.** Each Member Municipality must provide statements to the GVWD, pursuant to section 5.3, for every six-month period comprising January 1 to June 30 and July 1 to December 31, setting out:

- (a) the number and type of use of all Residential Use Parcels, Dwelling Units, and Residential Lot Development Units on which development cost charges were levied by it under this Bylaw;
- (b) the aggregate floor area of all Non-Residential Use buildings or structures on which development cost charges were levied by it under this Bylaw (calculated in accordance with the Rate Schedule);

- (c) the legal description and civic address of each Parcel on which development cost charges were levied by it under this Bylaw, whether such development cost charges were levied in respect of a Subdivision or a Building Permit;
- (d) the date and amount of each payment of development cost charges levied by it under this Bylaw and where section 4.6 applies to permit development cost charges levied under this Bylaw to be paid by instalments, the amount of instalment payments remaining to be paid to it and the dates for payment of such remaining instalments;
- (e) the total amount of all development cost charges levied by it under this Bylaw and the total amount of all remaining instalment payments;
- (f) the number, legal description, civic address and type of use of all Parcels in respect of which Subdivisions were approved where no development cost charges were levied by it under this Bylaw; and
- (g) the number and type of use of all Dwelling Units and Residential Lot Development Units and the aggregate floor area of all Non-Residential Use buildings or structures (calculated in accordance with the Rate Schedule) in respect of which Building Permits were required where no development cost charges were levied by it under this Bylaw.

5.5 **Failure to Remit Development Cost Charges.** If a Member Municipality fails, for any reason, to collect any development cost charges payable under this Bylaw or to remit to the GVWD any development cost charges collected by it, the Member Municipality must pay to the GVWD on demand an amount equal to the development cost charges that the Member Municipality should have collected or remitted under this Bylaw.

6.0 Severability

- 6.1 If a portion of this Bylaw is held to be invalid it shall be severed and the remainder of the Bylaw shall remain in effect.

Read a first time this 28 day of October, 2022.

Read a second time this 28 day of October, 2022.

Read a third time this 28 day of October, 2022.

Third reading rescinded this 27 day of January, 2023.

Read a third time as amended this 27 day of January, 2023.

Approved by the Inspector of Municipalities this 10 day of March, 2023.

Passed and finally adopted this _____ day of _____, _____.

George V. Harvie, Chair

Dorothy Shermer, Corporate Officer

Schedule A

GVWD DEVELOPMENT COST CHARGE RATES

<u>Description</u>	<u>Rate</u>
1. Residential Lot Development Unit	\$6,692 per Residential Lot Development Unit
2. Townhouse Dwelling Unit	\$5,696 per Dwelling Unit
3. Apartment Dwelling Unit	\$4,261 per Dwelling Unit
4. Non-Residential Use	\$3.39 multiplied by the number of square feet of Floor Area

GREATER VANCOUVER WATER DISTRICT
BYLAW NO. 256, 2022
A Bylaw to Establish a Waiver or Reduction of Development Cost Charges for Not-for-Profit
Rental Housing

WHEREAS:

- A. Pursuant to subsections 563(1) of the *Local Government Act*, RSBC 1996, c.323, the Greater Vancouver Water District, as a greater board, may, by bylaw, waive or reduce a development cost charge imposed by bylaw pursuant to section 559 of the *Local Government Act*, RSBC, 1996, c.323 for an "eligible development"; and
- B. It is deemed desirable to establish eligibility requirements and conditions for a waiver or reduction of development cost charges for not-for-profit rental housing, including affordable rental housing and student housing.

NOW THEREFORE the Board of the Greater Vancouver Water District enacts as follows:

1.0 Citation

- 1.1 The official citation of this bylaw is "Greater Vancouver Water District Development Cost Charge Waiver or Reduction for Not-for-Profit Rental Housing Bylaw No. 256, 2022". This bylaw may be cited as "GVWD Development Cost Charge Rental Housing Bylaw."

2.0 Definitions

- 2.1 In this Bylaw:

"Apartment Dwelling Unit" means a Dwelling Unit in a building or structure that consists or may consist of two or more storeys and contains or may contain four or more Dwelling Units, whereby the building or structure has a principal exterior entrance used in common for access to the Dwelling Units. Apartment Dwelling Unit does not include Dwelling Units that are Townhouse Dwelling Units;

"BC Housing" means the British Columbia Housing Management Commission;

"Building Permit" means any permit required by a Member Municipality that authorizes the construction, alteration or extension of a building or structure;

"CMHC" means Canada Mortgage and Housing Corporation;

"Combination Development" means any Development that comprises two or more of the following uses:

- (a) Apartment Dwelling Unit;

- (b) Residential Lot Development Unit;
- (c) Townhouse Dwelling Unit; and
- (d) Non-Residential Use;

“Development” means:

- (a) a Subdivision; or
- (b) the construction, alteration or extension of a building or structure for which a Building Permit is obtained;

but does not include:

- (c) an adjacent, separately titled parcel;

“Development Cost Charge” means a development cost charge payable by a registered owner to a Member Municipality on behalf of GVWD, pursuant to *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022*;

“Dwelling Unit” means one or more rooms comprising a self-contained unit that is used or intended to be used for living and sleeping purposes and for which are provided cooking facilities, or the facilities for installation of cooking facilities, and one or more bathrooms having a sink or wash-basin, a water closet, and a shower or bath;

“Effective Date” means the date this Bylaw comes into force and takes effect;

“Eligibility Criteria” means criteria established by a Not-for-Profit Society, BC Housing, CMHC, a Non-Profit Municipal Housing Corporation or a Registered Charity or any authorized designate of the foregoing entities, used to determine eligibility of a person to occupy a dwelling unit within a Not-for-Profit Rental Housing development;

“Greater Vancouver Water District” or “GVWD” means the Greater Vancouver Water District which is incorporated pursuant to the *Greater Vancouver Water District Act*, SBC 1924, c. 22;

“Group Home” means staffed residential housing for those with a level of disability that requires continual assistance to complete daily tasks of living (such as taking medication, dressing or bathing);

“Member Municipality” means a municipality that is a member of the GVWD;

“Non-Residential Use” means any building or structure or any portion of any building or structure that is not Apartment Dwelling Unit, Residential Dwelling Unit or Townhouse Dwelling Unit but for greater certainty, does not include any portion of any Residential Use

building or structure that is not part of a Dwelling Unit and is used or is intended to be used solely for the purpose of gaining access to and from Dwelling Units, solely for the maintenance of the building or structure or solely by the occupants of the Dwelling Units in the building or structure;

“Not-for-Profit Rental Housing” means:

(a) **“Not-for-Profit Affordable Rental Housing”** which means Residential Use Development, Combination Development or Supportive Living Housing comprising housing that is:

- (i) Owned, leased or otherwise held by a Not-for-Profit Society, BC Housing, CMHC, a Non-Profit Municipal Housing Corporation or a Registered Charity at the time of any application for, or issuance of, a waiver of Development Cost Charges;
- (ii) Operated as rental housing for people who meet Eligibility Criteria; and
- (iii) Governed by the terms of an agreement and/or covenant with the Province of British Columbia, BC Housing, CMHC or a municipality regarding the operation of the housing and stipulating how the Dwelling Units will be occupied and managed;

but not including:

- (i) a community care facility under the *Community Care and Assisted Living Act*, SBC 2002, c. 75;
- (ii) a continuing care facility under the *Continuing Care Act*, RSBC 1996, c. 70;
- (iii) a public or private hospital under the *Hospital Act*, RSBC 1996, c. 200;
- (iv) a Provincial mental health facility, an observation unit or a psychiatric unit designated under the *Mental Health Act*, RSBC 1996, c. 288; or
- (v) a housing based health facility that provides hospitality support services and personal health care; and

(b) **“Not-for-Profit Student Housing”** which means Residential Use Development or Combination Development that is:

- (i) Owned and operated by a Post-Secondary Institution at the time of any application for, or issuance of, a reduction of Development Cost Charges;
- (ii) Purpose built to provide rental housing for students attending that institution;
- (iii) Operated on a cost recovery basis; and

- (iv) Governed by the terms of a covenant with the Greater Vancouver Water District confirming the use of the Development is restricted for a period of 60 years to the purpose of providing rental housing for students attending that institution, that the housing will be operated by the Post-Secondary Institution or its designated agent, and will be operated on a cost recovery basis;

“Not-for-Profit Society” means a society registered under the *Societies Act*, SBC 2015, c. 18, in respect of which:

- (a) The society’s bylaws or constitution’s stated purpose is to provide affordable housing for low (or low and moderate) income households, or another similar purpose consistent with the type of services being provided;
- (b) The society’s bylaws provide that the society’s directors may not be remunerated in any capacity, nor may the directors serve as employees;
- (c) The society’s bylaws provide that upon dissolution or wind up of the society, the society’s assets will be disposed to an organization(s) with a similar not-for-profit purpose of providing affordable housing;
- (d) Items addressed in subsections (a), (b) and (c) must be unalterable or otherwise restricted in accordance with the applicable legislation or regulation, or require the prior written consent of GVWD to alter; and
- (e) The society’s rules of conduct must be in accordance with the society’s purposes and applicable legislation;

“Non-Profit Municipal Housing Corporation” means a non-profit housing corporation established at the initiative of a municipality or regional district;

“On-Site Support Services” means services to support independent daily living that are physically offered in the building’s office or common areas, and include but are not limited to:

- (a) Health and mental health services;
- (b) Health and community support referrals;
- (c) Addiction services;
- (d) Employment and education services;
- (e) Job and life skills training;
- (f) Assistance with meal preparation or housekeeping; and
- (g) Counselling and outreach services;

but not including personal continual assistance services such as bathing, dressing or medication assistance, as offered in a Group Home;

“Post-Secondary Institution” means a college, university, special purpose university or institution as enabled pursuant to the *College and Institute Act*, RSBC 1996, c. 52;

“Registered Charity” means a charitable foundation or a charitable organization as defined in the *Income Tax Act*, R.S.C. 1985, c. 1;

- (a) The registered charity’s bylaws or constitution’s stated purpose is to provide affordable housing for low (or low and moderate) income households, or another similar purpose consistent with the type of services being provided;
- (b) The registered charity’s bylaws provide that the society’s directors may not be remunerated in any capacity, nor may the directors serve as employees;
- (c) The registered charity’s bylaws provide that upon dissolution or wind up of the society, the society’s assets will be disposed to an organization(s) with a similar charitable purpose;
- (d) Items addressed in subsections (a), (b) and (c) must be unalterable or otherwise restricted in accordance with the applicable legislation or regulation, or require the prior written consent of GVWD to alter; and
- (e) The registered charity’s rules of conduct must be in accordance with the charity’s purposes and applicable legislation;

“Rent” means money paid or agreed to be paid, or value or a right given or agreed to be given, by or on behalf of a tenant to a landlord in return for the right to rent a Dwelling Unit, for the use of common areas and for services or facilities and includes any and all strata fees, regardless of whether such fees are paid directly to the landlord, but does not include any of the following:

- (a) a security deposit;
- (b) a pet damage deposit;
- (c) a fee prescribed under section 97 (2) (k) of the *Residential Tenancy Act*, SBC 2002, c. 78;

“Residential Lot Development Unit” means a Dwelling Unit on a lot (not including an Apartment Dwelling Unit or a Townhouse Dwelling Unit) but, if the Dwelling Unit is a Single Family Residential Dwelling, also includes:

- (a) the construction, alternation or extension of a building or structure for up to one Secondary Suite in the Single Family Residential Dwelling,
- (b) the construction, alteration or extension of up to one Laneway House, or
- (c) both.

“Residential Use” means Apartment Dwelling Unit, Residential Lot Development Unit or Townhouse Dwelling Unit;

“Subdivision” includes a division of land into two or more Parcels, whether by plan, apt descriptive words or otherwise under the *Land Title Act*, RSBC 1996, c. 250 or the *Strata Property Act*, SBC 1998, c. 43, the consolidation of two or more Parcels of land, and phased strata plans;

“Supportive Living Housing” means housing, not including a Group Home, that integrates Dwelling Units for persons who were previously homeless or who are at risk of homelessness, who may also

- (a) have a mental illness;
- (b) have or be recovering from drug or alcohol addictions; or
- (c) experience other barriers to housing;

with On-Site Support Services that are available to the residents of the Dwelling Units, where occupancy is not restricted to less than 90 days;

“Townhouse Dwelling Unit” means a Dwelling Unit in a building or structure that contains or may contain four or more Dwelling Units, whereby each Dwelling Unit has a direct exterior entrance.

2.2 **Same Meaning.** Terms defined in the *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022*, or incorporated by reference into that Bylaw have the same meaning in this Bylaw.

2.3 **References to an Enactment Include Its Amendments.** References in this Bylaw to an enactment include the enactment as it may be amended or replaced from time to time.

3.0 **Waiver or Reduction of Development Cost Charges**

3.1 **Waiver of Development Cost Charges for Eligible Not-for-Profit Affordable Rental Housing Development.** Notwithstanding section 4.1 of the *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022*, and subject to section 3.3 of this Bylaw,

the GVWD will, for the following eligible development, waive to the applicable Member Municipality on behalf of the Not-for-Profit Society, BC Housing, CMHC, Non-Profit Municipal Housing Corporation or Registered Charity that is the registered owner at the time of the application for and issuance of a waiver of Development Cost Charges, Development Cost Charges that are otherwise payable:

- (a) All Dwelling Units within a Not-for-Profit Affordable Rental Housing Development, if at least thirty percent of the Dwelling Units are to be occupied by households with incomes at or below housing income limits for the corresponding size of housing unit, as set out in the current “Housing Income Limits” (HILs) table published by the BC Housing, or equivalent publication; or
- (b) Only those Dwelling Units within a Not-for-Profit Affordable Rental Housing Development that are to be occupied by households with incomes at or below housing income limits for the corresponding size of housing unit, as set out in the current HILs table, or equivalent publication, if less than thirty percent of all of the Dwelling Units are to be occupied by such households.

3.2 Reduction of Development Cost Charges for Eligible Not-for-Profit Student Housing Development. Notwithstanding section 4.1 of the *Greater Vancouver Water District Development Cost Charge Bylaw No. 257, 2022*, and subject to section 3.3 of this Bylaw, the GVWD will, for the following eligible development, for a Post-Secondary Institution that is the registered owner at the time of the application for and issuance of a reduction of Development Cost Charges, reduce by 50% the Development Cost Charges that are otherwise payable for:

- (a) All Dwelling Units within a Not-for-Profit Student Housing Development that are to be occupied by students attending the Post-Secondary Institution.

3.3 No waiver pursuant to section 3.1 and no reduction pursuant to section 3.2 shall be granted unless a registered owner’s application for a waiver or a reduction of Development Cost Charges in respect of Dwelling Units in a Not-for-Profit Rental Housing Development has been submitted to, and approved by the GVWD as fulfilling all of this Bylaw’s eligibility requirements and conditions for a waiver or a reduction of Development Cost Charges.

4.0 Record Keeping and Reporting

4.1 Statements. Each Member Municipality must provide statements to GVWD, for every 12-month period comprising January 1 to December 31, and this will include:

- (a) the registered owner or lessee; and
- (b) number and type of use

of all Dwelling Units (calculated in accordance with the Rate Schedule set out in the *Greater Vancouver Water District Development Cost Charge Bylaw, No. 257, 2022*) in respect of which building permits were required where Development Cost Charges were waived or reduced under this Bylaw;

- 4.2 **Reports.** GVWD staff will report annually to the GVWD Board of Directors, and any time upon the request of the Board, the number and cost of GVWD Development Cost Charge waivers or reductions granted under this Bylaw.

5.0 Severability

- 5.1 If a portion of this Bylaw is held to be invalid it shall be severed and the remainder of the Bylaw shall remain in effect.

Read a first, second and third time this 28 day of October, 2022.

Third reading rescinded this 27 day of January, 2023.

Read a third time as amended this _____ day of _____, _____.

Passed and finally adopted this _____ day of _____, _____.

George V. Harvie, Chair

Dorothy Shermer, Corporate Officer

COMMITTEE INFORMATION ITEMS AND DELEGATION SUMMARIES

Greater Vancouver Water District

Board Meeting Date – Friday, April 28, 2023

This information item, listing recent information received by committee, is provided for the GVWD Board's information. Please access a complete PDF package [here](#).

Water Committee – April 28, 2023*Delegations:*

No delegations presented

Information Items:

- 5.1 GVWD Electrical Energy Use, Generation, and Management
- 5.2 2022 Contribution Agreement Annual Reports – Seymour Salmonid Society and Coquitlam River Watershed Roundtable
- 5.4 GVWD Water Supply System 2022 Annual Update
- 5.5 2023 Water Conservation Communications and Public Outreach Update
- 5.6 GVWD Capital Program Expenditure Update to December 31, 2022

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