To: Water Committee

From: Marilyn Towill, General Manager, Water Services

Date: June 25, 2021 Meeting Date: July 15, 2021

Subject: **Draft Water Services 2022 – 2026 Capital Plan**

RECOMMENDATION

That the Water Committee receive for information the report dated, June 25, 2021, titled "Draft Water Services 2022 – 2026 Capital Plan".

EXECUTIVE SUMMARY

The draft 2022 – 2026 Water Services Capital Plan has been prepared based on direction received at the April 8, 2021 Metro Vancouver Board Budget Workshop. As part of Metro Vancouver's focus on enhancing transparency and governance of the Capital Plan, this report represents a new step in the capital budgeting process for this year. The intent is for the Water Committee to provide comments on the draft Capital Plan, which will then be incorporated into the Fall budget presentations to the Water Committee and GVWD Board.

The estimated 2022 Capital Cash Flow is $492.7 million with a total estimated spend of $2.6 billion over the five years (2022 - 2026). With respect to the common four years compared to the prior cycle's capital plan, the estimated spend has increased by $21.3 million, or 1.1%.

PURPOSE

To present to the Water Committee the draft Water Services Department 2022 – 2026 Capital Plan for comments.

BACKGROUND

On April 8, 2021, Metro Vancouver held a Board Budget Workshop with the objective to seek direction for the preparation of the 2022 - 2026 Financial Plan. This report provides the Water Committee with the information needed to provide comments on the Capital Plan that will be incorporated into the 2022 – 2026 Financial Plan. Going forward, this step will be included in the capital planning process to enhance the transparency and governance of the capital planning process.

Water Customer Level of Service Objectives

Projects within the draft 2022 – 2026 Capital Plan are guided by the Water Customer Level of Service Objectives, specifically:

- Maintain quality of the drinking water delivered;
- Maintain capacity and reliability of the Water Supply System;
- Improve environmental stewardship; and
- Minimize timeline to recover from a major event (including Seismic, Power Interruption and Climate Change)

On an ongoing basis, staff monitor and evaluate the performance of the Water Supply System and its ability to achieve the service objectives. Where risks to service objectives are identified, mitigation actions are planned and incorporated into annual work plans. These actions may take the form of changes to operating and maintenance activities, changes to infrastructure, and/or the development of emergency response procedures. The projects in the annual Capital Plan embody the infrastructure changes required to achieve the customer level of service objectives.

CAPITAL PLAN HIGHLIGHTS

The draft 2022 - 2026 Capital Plan includes $492.7 million for 2022 and a total of $2.6 billion over the five years, with an average of $511.8 million per year (see Attachment). Out of 142 projects on the 5-year plan, the largest eight projects make up 60.9% of the capital spending.

The spending over the next 5 years is driven by infrastructure changes required as a result of:

- Increase in the number of residents moving into the region, creating an increased demand for drinking water (Growth);
- Ensuring that infrastructure is resilient to major emergency events, including power outages, seismic events, and the results of climate change (Resilience);
- Need for replacement or refurbishment of existing infrastructure to ensure that it continues to perform as required to meet service objectives (Maintenance); and
- Opportunities to reduce the life-cycle cost of services and/or achieve Board goals such as climate change mitigation and the provision of enhanced service levels (Opportunity and Upgrade).

Key capital projects planned or ongoing in 2022 – 2026 Water Services Department ("WS") include the following:

- Cape Horn Pump Station No. 3 (Growth);
- Kennedy Newton Main (Growth);
- South Surrey Main No. 2 (Growth);
- Annacis Main No. 5 (Growth);
- Whalley Kennedy Main No. 2 (Growth);
- Fleetwood Reservoir (Growth);
- Newton Pump Station No. 2 (Growth);
- Haney Main No. 4 (Growth);
- Hellings Tank No. 2 (Growth)
- Central Park Main No. 2 (Maintenance);
- Douglas Road Main No. 2 Still Creek (Maintenance);
- Cleveland Dam Public Warning System and Enhancements (Maintenance);
- Port Moody Main No.3 (Dewdney Trunk Rd Relocation& Scott Creek Section) (Maintenance);
- Kersland Reservoir No. 1 Structural Improvements (Maintenance);
- Capilano Raw Water Pump Station - Back-up Power (Resilience);
- Barnston/Maple Ridge Pump Station - Back-up Power (Resilience);
- Seymour Main #5 (Resilience);
- Burnaby Mountain Tank #2 and #3 (Resilience);
- Clayton Langley Main #2 (Resilience);
- Pebble Hill Reservoir Seismic Upgrade (Resilience); and

- Water Optimization (Instrumentation and non-billing Flow Meters) (Upgrade and Opportunity);
- Water Meter Upgrades (billing meters) (Upgrade and Opportunity); and
- LSCR Learning Lodge Replacement (Upgrade and Opportunity).

The Project Delivery Department ("PDE") has responsibility for the delivery of several of the Water Services Department's major projects, specifically the highest value, risk and consequence projects:

- Annacis Water Supply Tunnel (Growth);
- Cambie-Richmond Water Supply Tunnel (Resilience);
- Coquitlam Lake Water Supply (Growth);
- Coquitlam Water Main (Growth);
- Haney Water Supply Tunnel (Resilience);
- Lulu-Island Delta Water Supply Tunnel (Maintenance);
- Second Narrows Water Supply Tunnel (Resilience); and
- Stanley Park Water Supply Tunnel (Maintenance).

The Capital Program for Water Services is currently funded by long-term debt, reserves, contributions from the operating budget, and some external (interagency and senior level government grant) contributions.

Capital Plan Changes

The completion of multi-year projects is complex and subject to change due to a variety of factors including: unforeseen ground conditions, property availability, permitting challenges, cost escalation, raw materials price volatility, and skilled trades worker availability. The breakdown of the total revised 2022 – 2026 Capital Plan, compared to the prior cycle Capital Plan is summarized below.

($ Millions)

Prior Cycle Capital Plan 2021-2025	Cash flow 2021	Adjustments to 2022-2025 Capital Plan					Cash flow 2026	Draft Capital Plan 2022-2026
		Carry-Forward	Deferrals/ Accel	Risk	Scope	Total		
2,361	(431)	56	(201)	131	36	21	608	2,559

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The draft 2022 - 2026 Capital Plan includes $492.7 million for 2022 and a total of $2.6 billion over the five years, an average of $511.8 million per year. The intent is that the Water Committee provide comments, which will then be incorporated into the Fall budget presentations to the Committees and the Board.

SUMMARY / CONCLUSION

The 2022 – 2026 Capital Plan is the consolidated list of infrastructure projects required to meet and/or maintain the regional Water Services Customer Level of Service Objectives and includes the financial impacts of these projects over the next five years.

The presentation of the draft 2022 – 2026 Capital Plan for Water Services provides the opportunity for the Water Committee to provide comments, which will be incorporated into the Fall Budget budget presentations to the Water Committee and the GVWD Board.

Attachment

Draft Water Services 2022-2026 Capital Plan

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GREATER VANCOUVER WATER DISTRICT
CAPITAL PORTFOLIO
WATER SERVICES
2022 PROJECTED CASHFLOW

	ACTUALS ESTIMATED TO DEC 31 2021	2022 CAPITAL CASH FLOW	2023 CAPITAL CASH FLOW	2024 CAPITAL CASH FLOW	2025 CAPITAL CASH FLOW	2026 CAPITAL CASH FLOW	ACTIVE STAGE	PRIMARY DRIVER
CAPITAL EXPENDUTURES								
Water Mains								
Angus Drive Main	$ 30,619,070	$ 50,000	$ -	$ -	$ -	$ -	Construction	Growth
Annacis Main No. 5 (Marine Crossing)	45,793,371	66,000,000	70,000,000	80,000,000	70,000,000	65,000,000	Construction	Growth
Annacis Main No. 5 (North)	1,832,103	1,600,000	16,500,000	15,000,000	5,500,000	20,000,000	Design	Growth
Annacis Main No. 5 (South)	9,888,945	200,000	1,900,000	14,000,000	14,000,000	16,800,000	Design	Growth
Burnaby Mountain Main No. 2	-	-	300,000	1,600,000	400,000	5,000,000	Planned	Maintenance
Cambie Richmond Main No. 3 (Marine Crossing)	35,048,291	18,200,000	2,000,000	8,000,000	8,500,000	3,500,000	Construction	Resilience
Capilano Main No. 5 (South Shaft to Lost Lagoon)	15,409,774	38,900,000	50,000,000	70,000,000	50,000,000	55,000,000	Construction	Maintenance
Central Park Main No. 2 (10th Ave to Westburnco)	150,000	900,000	1,200,000	6,800,000	7,000,000	8,000,000	Construction	Maintenance
Central Park Main No. 2 (Patterson to 10th Ave)	40,269,413	24,200,000	14,500,000	11,500,000	-	-	Construction	Maintenance
Clayton Langley Main No. 2	-	400,000	600,000	700,000	200,000	3,000,000	Construction	Resilience
Coquitlam Main No. 4	16,690,814	27,000,000	61,600,000	71,800,000	90,400,000	173,000,000	Construction	Growth
Douglas Road Main No. 2 - Kincaid Section	9,800,000	1,000,000	1,000,000	500,000	-	-	Construction	Maintenance
Douglas Road Main No. 2 (Vancouver Heights Section)	20,169,201	300,000	-	-	-	-	Construction	Maintenance
Douglas Road Main No. 2 Still Creek	13,000,000	22,600,000	14,000,000	13,500,000	-	-	Construction	Maintenance
Haney Main No. 4 (Marine Crossing)	235,112	5,000,000	15,000,000	5,000,000	5,000,000	10,000,000	Construction	Resilience
Haney Main No. 4 (West Section)	1,143,594	400,000	350,000	-	-	-	Construction	Growth
Kennedy Newton Main	68,061,498	23,850,000	13,000,000	9,500,000	-	-	Construction	Growth
Lulu Island - Delta Main No. 2 (Marine Crossing)	-	-	4,000,000	5,500,000	7,500,000	8,000,000	Planned	Maintenance
Newton Reservoir Connection	-	-	450,000	1,100,000	4,500,000	8,000,000	Planned	Growth
Port Mann Main No. 1 (Fraser River Crossing Removal)	1,005,000	250,000	3,250,000	8,500,000	5,000,000	250,000	Construction	Maintenance
Port Mann Main No. 2 (South)	35,914,638	500,000	-	-	-	-	Construction	Growth
Port Moody Main No. 3 Scott Creek Section	374,885	550,000	3,500,000	3,000,000	2,000,000	2,500,000	Construction	Maintenance
Queensborough Main Royal Avenue Relocation	5,100,000	2,100,000	300,000	-	-	-	Construction	Maintenance
Relocation and Protection for MOTI Expansion Project Broadway	1,205,849	650,000	500,000	1,500,000	1,500,000	3,500,000	Construction	Maintenance
Relocation and Protection for Translink Expansion Project Surrey Langley SkyTrain	-	2,650,000	2,200,000	1,000,000	750,000	-	Design	Maintenance
Sapperton Main No. 2 North Road Relocation and Protection	350,000	4,550,000	1,600,000	-	-	-	Construction	Maintenance
Second Narrows Crossing (Tunnel)	273,143,022	75,000,000	70,000,000	30,000,000	20,600,000	-	Construction	Resilience
Second Narrows Crossing 1 & 2 (Burrard Inlet Crossing Removal)	-	500,000	1,000,000	500,000	1,000,000	12,000,000	Construction	Maintenance
Seymour Main No. 2 Joint Improvements	1,501,462	750,000	1,000,000	-	1,000,000	1,000,000	Construction	Resilience
Seymour Main No. 5 III (North)	6,465,507	250,000	-	-	-	100,000	Construction	Resilience
South Delta Main No. 1 - 28 Ave to 34B Ave	22,514,859	100,000	-	-	-	-	Construction	Upgrade
South Delta Mains - 28 Ave Crossover	10,638,578	50,000	-	-	-	-	Construction	Upgrade
South Surrey Main No. 1 Nickomekl Dam Relocation	300,000	1,700,000	3,000,000	2,100,000	-	-	Design	Maintenance
South Surrey Main No. 2	400,000	1,100,000	1,500,000	3,500,000	3,500,000	9,500,000	Construction	Growth
Tilbury Junction Chamber Valves Replacement with Actuators	5,300,000	300,000	-	-	-	-	Construction	Upgrade
Water Meter Upgrades	5,150,000	2,700,000	3,950,000	3,500,000	3,500,000	3,600,000	Construction	Upgrade
Water Optimization - Flow Meters (Non-billing) Phase 1	-	-	1,500,000	2,000,000	3,000,000	4,000,000	Planned	Upgrade
Water Optimization - Flow Meters (Non-billing) Phase 2	-	250,000	1,500,000	750,000	2,000,000	3,000,000	Construction	Upgrade
Water Optimization - Instrumentation	150,000	750,000	2,100,000	2,500,000	2,500,000	2,500,000	Construction	Upgrade
Water Optimization Automation & Instrumentation	7,790,000	850,000	900,000	-	-	-	Construction	Upgrade
Whalley Kennedy Main No. 2	-	-	1,000,000	1,300,000	1,300,000	2,000,000	Planned	Growth
Whalley Main	31,128,529	150,000	-	-	-	-	Construction	Growth

GREATER VANCOUVER WATER DISTRICT
CAPITAL PORTFOLIO
WATER SERVICES
2022 PROJECTED CASHFLOW

	ACTUALS ESTIMATED TO DEC 31 2021	2022 CAPITAL CASH FLOW	2023 CAPITAL CASH FLOW	2024 CAPITAL CASH FLOW	2025 CAPITAL CASH FLOW	2026 CAPITAL CASH FLOW	ACTIVE STAGE	PRIMARY DRIVER
Projects under $5M	9,631,649	17,450,000	8,200,000	2,750,000	3,350,000	1,600,000		
Total Water Mains	**726,175,164**	**343,750,000**	**373,400,000**	**377,400,000**	**314,000,000**	**420,850,000**		
Pump Stations								
Barnston/Maple Ridge Pump Station - Back-up Power	$ 300,000	$ 8,700,000	$ 4,500,000	$ 600,000	$ 2,000,000	$ 2,700,000	Design	Resilience
Burnaby Mountain Pump Station No. 2	300,000	100,000	900,000	1,100,000	700,000	9,000,000	Construction	Maintenance
Cape Horn Pump Station No. 3	1,130,535	1,500,000	2,250,000	4,500,000	22,000,000	59,000,000	Construction	Growth
Capilano Raw Water Pump Station - Back-up Power	14,929,590	13,050,000	13,000,000	1,000,000	-	-	Construction	Resilience
Central Park WPS Starters Replacement	1,950,000	4,500,000	1,550,000	-	-	-	Design	Maintenance
Newton Pump Station No. 2	6,145,921	13,900,000	16,900,000	9,500,000	4,000,000	-	Construction	Growth
Westburnco Pump Station - Back-up Power	1,127,820	400,000	950,000	5,500,000	8,000,000	7,000,000	Design	Resilience
Projects under $5M	1,849,431	3,900,000	900,000	350,000	650,000	1,000,000		
Total Pump Stations	**$ 27,733,297**	**$ 46,050,000**	**$ 40,950,000**	**$ 22,550,000**	**$ 37,350,000**	**$ 78,700,000**		
Reservoirs								
Burnaby Mountain Tank No. 2	$ 401,000	$ 1,249,000	$ 1,700,000	$ 7,000,000	$ 7,000,000	$ 4,000,000	Design	Resilience
Burnaby Mountain Tank No. 3	400,000	800,000	1,700,000	500,000	7,000,000	7,000,000	Design	Resilience
Clayton Reservoir	26,075,871	550,000	-	-	-	-	Construction	Resilience
Fleetwood Reservoir	15,823,062	23,000,000	15,350,000	2,150,000	-	-	Construction	Growth
Grandview Reservoir Unit No. 2	-	-	-	400,000	800,000	1,400,000	Planned	Growth
Hellings Tank No. 2	6,378,614	500,000	6,000,000	15,500,000	11,000,000	4,500,000	Construction	Growth
Kersland Reservoir No. 1 Structural Improvements	1,901,846	4,000,000	-	-	-	-	Construction	Maintenance
Pebble Hill Reservoir No. 3 Seismic Upgrade	425,000	50,000	25,000	-	5,000,000	4,000,000	Design	Resilience
Pebble Hill Reservoir Seismic Upgrade	5,327,507	6,950,000	2,500,000	-	-	-	Construction	Resilience
Reservoir Isolation Valve Automation	1,399,196	500,000	1,000,000	1,000,000	1,250,000	1,150,000	Construction	Resilience
Sunnyside Reservoir Units 1 and 2 Seismic Upgrade	7,510,853	60,000	3,000,000	7,200,000	-	-	Construction	Resilience
Projects under $5M	3,778,573	3,750,000	2,350,000	3,350,000	1,700,000	4,600,000		
Total Reservoirs	**$ 69,421,522**	**$ 41,409,000**	**$ 33,625,000**	**$ 37,100,000**	**$ 33,750,000**	**$ 26,650,000**		
Treatment Plants								
Coquitlam Lake Water Supply	$ 16,713,045	$ 19,000,000	$ 33,000,000	$ 35,000,000	$ 44,000,000	$ 56,000,000	Construction	Growth
Coquitlam Intake Tower Seismic Upgrade	1,600,000	400,000	-	5,000,000	14,000,000	5,000,000	Design	Resilience
CWTP Ozone Back-up Power	-	-	500,000	1,450,000	4,000,000	1,500,000	Planned	Resilience
CWTP Ozone Generation Upgrades for Units 2 & 3	4,850,000	2,050,000	100,000	-	-	-	Construction	Upgrade
Online Chlorine and pH Analyzers	-	-	600,000	1,200,000	1,200,000	1,500,000	Planned	Upgrade
SCFP Additional Pre-Treatment	-	-	-	-	-	1,000,000	Planned	Maintenance
SCFP Clearwell Membrane Replacement	-	-	200,000	1,200,000	-	5,500,000	Construction	Maintenance
Projects under $5M	6,175,000	3,725,000	4,100,000	6,550,000	3,650,000	900,000		
Total Treatment Plants	**$ 29,338,045**	**$ 25,175,000**	**$ 38,500,000**	**$ 50,400,000**	**$ 66,850,000**	**$ 71,400,000**		
Others								
Beach Yard Facility - Site Redevelopment	$ -	$ -	$ -	$ -	500,000	1,000,000	Planned	Maintenance
Capilano Hydropower	1,468,368	1,000,000	1,750,000	-	-	-	Definition	Opportunity
Cleveland Dam Lower Outlet Trashrack Replacement and Debris Removal	-	-	-	-	-	500,000	Planned	Maintenance
Cleveland Dam Public Warning System and Enhancements	-	7,000,000	3,000,000	-	-	-	Design	Maintenance

GREATER VANCOUVER WATER DISTRICT
CAPITAL PORTFOLIO
WATER SERVICES
2022 PROJECTED CASHFLOW

	ACTUALS ESTIMATED TO DEC 31 2021	2022 CAPITAL CASH FLOW	2023 CAPITAL CASH FLOW	2024 CAPITAL CASH FLOW	2025 CAPITAL CASH FLOW	2026 CAPITAL CASH FLOW	ACTIVE STAGE	PRIMARY DRIVER
Cleveland Dam Spillway Resurfacing	-	-	-	-	-	400,000	Planned	Maintenance
Lower Seymour Conservation Reserve Learning Lodge Replacement	2,993,884	1,900,000	100,000	-	-	-	Construction	Upgrade
Newton Rechlorination Station No. 2	-	-	400,000	600,000	1,500,000	1,500,000	Planned	Maintenance
Rechlorination Station Upgrades	700,000	600,000	1,500,000	1,500,000	1,000,000	6,000,000	Design	Maintenance
Seymour Falls Dam Public Warning System	-	-	1,000,000	4,000,000	5,000,000	-	Planned	Maintenance
South Fraser Works Yard	10,455,096	20,000,000	1,500,000	-	-	-	Design	Maintenance
Projects under $5M	13,067,889	5,839,000	6,750,000	1,000,000	1,000,000	1,095,000		
Total Others	**$ 28,685,237**	**$ 36,339,000**	**$ 16,000,000**	**$ 7,100,000**	**$ 9,000,000**	**$ 10,495,000**		
TOTAL CAPITAL EXPENDITURES	**$ 881,353,265**	**$ 492,723,000**	**$ 502,475,000**	**$ 494,550,000**	**$ 460,950,000**	**$ 608,095,000**		

SUMMARY BY DRIVER								
Growth	$ 287,663,739	$ 179,250,000	$ 240,800,000	$ 263,750,000	$ 271,000,000	$ 415,200,000		
Maintenance	146,851,640	163,275,000	127,250,000	144,400,000	91,500,000	125,945,000		
Resilience	383,599,147	138,548,000	118,875,000	73,950,000	85,500,000	51,350,000		
Upgrade	61,770,371	10,650,000	13,800,000	12,450,000	12,950,000	15,600,000		
Opportunity	1,468,368	1,000,000	1,750,000	-	-	-		
Total	**$ 881,353,265**	**$ 492,723,000**	**$ 502,475,000**	**$ 494,550,000**	**$ 460,950,000**	**$ 608,095,000**		

To: Water Committee

From: Goran Oljaca, Director, Engineering and Construction, Water Services

Date: June 14, 2021 Meeting Date: July 15, 2021

Subject: **Water Services Capital Program Expenditure Update to April 30, 2021**

RECOMMENDATION

That the Water Committee receive for information the report dated June 14, 2021, titled "Water Services Capital Program Expenditure Update to April 30, 2021".

EXECUTIVE SUMMARY

The capital expenditure reporting process as approved by the Board provides for regular status reports on capital expenditures 3 times per year. This is the first eport for 2021 which includes both the overall capital program for Water Services with a multi-year view of capital projects and the actual capital spending for the 2021 fiscal year to April 30, 2021 in comparison to the prorated annual budget. In 2021 the annual capital expenditures for Water Services are $62.4 million to date compared to a prorated annual capital budget of $144.5 million.

Forecasted expenditures for the current Water Services capital program remain within the approved budgets through to completion.

PURPOSE

To report on the status of the Water Services capital program and financial performance for the 2021 fiscal year to April 30, 2021.

BACKGROUND

The capital expenditure reporting process as approved by the Board provides for regular status reports on capital expenditures with interim reports sent to the Water, Liquid Waste, Zero Waste, and Performance and Audit Committees, in July and October, with a final year-end report to the Committees and the Boards in April of each year.

This is the first in a series of three reports for 2021 and looks at both the overall capital program for Water Services with a multi-year view of capital projects and the actual capital spending for the 2021 fiscal year to April 30, 2021 in comparison to the prorated annual budget.

2021 CAPITAL EXPENDITURES

Capital Program Funding

The capital spending for Water Services is funded through the water operating budget by a combination of contribution to capital (pay-as-you-go funding) and debt service costs (principal and interest payments). As a result, the annual impact on the ratepayers is significantly less than the level of budgeted capital expenditures.

Overall Capital Program

The overall capital program for Water Services includes capital projects which require multiple years to complete. These projects are broken down into various phases such as project definition, pre-design, detailed design and construction. With the completion of each phase, more information is learned for the appropriate costing of subsequent phases.

It is expected that the capital spending on all Water Services capital projects completed in 2021 or ongoing at some point in 2021 will be under budget by approximately $21.3 million, or within 0.3% of total budget.

Table 1 in Attachment 1 provides a summary of Water Services capital expenditures for both ongoing and completed projects. Completed Projects include a summary of actual spending compared to the Board approved spending limits while the Ongoing Projects include a summary of projected spending to completion compared to Board approved spending limits. With the rare exception, projects tend to complete with actual spending below the approved limits.

Attachment 2 provides the details behind the summary information including specific capital projects, summary financial information and notes where required. Attachment 3 provides additional project status information for some of the key projects included in Attachment 1 – Table 1.

2021 Capital Program Process

The Metro Vancouver financial planning process includes Board approval of both an annual Operating Budget (operations, contribution to capital and debt service) and an annual Capital Budget for the planned capital infrastructure projects. The annual Capital Budget comprises the projected spending for a list of capital projects either continuing or to be started within the calendar year.

In 2021, capital expenditures for Water Services are $62.4 million to April 30, 2021 compared to a prorated annual capital budget of $144.5 million. The total annual capital budget for 2021 is $433.6 million.

Forecasted expenditures for the current Water Services capital program remain within the approved budgets for 2021 and through to completion.

Table 2 in Attachment 1 provides a summary of the 2021 actual capital spending to April 30, 2021 compared to the Board approved capital budget and prorated budget to April 30, 2021.

Capital Program Impacts from COVID-19

During these unprecedented times of health and economic uncertainty, all departments have been expected to monitor the impacts of the pandemic on their operations. This includes capital program expenditures.

Overall, the impact to the Water Service's capital program has largely been schedule related, with some notable impacts to project expenditures confirmed to date. Staff are monitoring impacts on their projects regularly. Some impacts to project schedules or expenditures are included under the respective project section of Attachment 3.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Capital expenditures are funded internally (pay as you go) and through debt service costs (interest and principal payments). As capital expenditures are incurred, short term financing is secured and converted twice per year to long term debt through the Municipal Finance Authority.

CONCLUSION

This is the first in a series of three reports on capital expenditures for 2021. Water Services is projecting to be under budget for capital projects ongoing or completed in 2021.

Forecasted expenditures for the current Water Services capital program are anticipated to remain within the approved budgets through to completion.

Attachments

1. Capital Expenditure Summary – Water Services (*45527284*)
2. Detailed 2021 Water Services Capital Expenditure Summary – April (*45700349*)
3. Water Services Capital Project Status Information (*45510102*)

45513816

Metro Vancouver

Capital Expenditure Summary
Water Services
As at April 30, 2021

Table 1 – Ongoing and Completed Project Summary

Water Services	Total Projected to Completion	Total Budget	Projected Variance
Ongoing	$ 7,386,971,000	$ 7,366,461,000	$ 20,510,00
Completed	8,850,000	8,050,000	800,000
Not Started	775,500,000	775,500,000	-
Cancelled	-	-	-
	$ 8,171,321,000	**$ 8,150,011,000**	**$ 21,310,000**

Table 2 – April 2021 Capital Spending Summary

Water Services	2021 Budget	Prorated Budget to April 2021	Actual Expenditures	
Infrastructure Growth Capital	$ 167,550,00	$ 55,850,000	$ 11,385,877	
Infrastructure Maintenance Capital	91,200,00	30,400,000	18,935,944	
Infrastructure Resilience Capital	157,900,000	52,633,000	34,509,858	
Infrastructure Upgrade Capital	14,900,000	4,967,000	(2,473,735)	
Opportunity Capital	2,000,000	667,000	-	
	$ 433,550,000	**$ 144,517,000**	**$ 62,357,944**	**43%**

45527284

Metro Vancouver

ATTACHMENT 2

Water Services Capital Expenditures Summary
As of April 30, 2021

Project Name	Project Location	Lifetime Total Project Budget	Lifetime Total Expenditures to Date	Lifetime Remaining Budget	Lifetime Total Projected Expenditures	Lifetime Projected Remaining Budget	Percent Complete	Status	Project on Schedule?	Note	Comments
<program_desc>											
Infrastructure Growth Capital											
Annacis Main No. 5 (Marine Crossing)	New West/Surrey	488,000,000	32,777,640	455,222,360	485,000,000	3,000,000	7%	Ongoing	Y		
Annacis Main No. 5 (North)	New Westminster	51,500,000	585,370	50,914,630	51,500,000	-	1%	Ongoing	Y		
Annacis Main No. 5 (South)	Surrey	56,900,000	2,281,268	54,618,732	56,900,000	-	5%	Ongoing	Y		
Cape Horn Pump Station No. 3	Coquitlam	171,550,000	874,664	170,675,336	171,550,000	-	1%	Ongoing	Y		
Coquitlam Intake No. 2 & Tunnel	Coquitlam	1,181,230,000	7,798,481	1,173,431,519	1,181,230,000	-	1%	Ongoing	Y		
Coquitlam Intake No. 2 (Water Treatment)	Coquitlam	1,486,000,000	582,968	1,485,417,032	1,486,000,000	-	1%	Ongoing	Y		
Coquitlam Main No. 4 (Cape Horn)	Coquitlam	152,600,000	1,252,838	151,347,162	152,600,000	-	1%	Ongoing	Y		
Coquitlam Main No. 4 (Central Section)	Coquitlam	204,470,000	3,796,183	200,673,817	204,470,000	-	2%	Ongoing	Y		
Coquitlam Main No. 4 (South Section)	Coquitlam	408,250,000	3,955,214	404,294,786	408,250,000	-	2%	Ongoing	Y		
Fleetwood Reservoir	Surrey	43,367,000	4,030,104	39,336,896	43,367,000	-	9%	Ongoing	N		Project delayed due to property approval.
Grandview Reservoir Unit No. 2	Surrey	26,000,000	-	26,000,000	26,000,000	-	0%	Not Started	Y		
Haney Main No. 4 (West Section)	Port Coquitlam	74,050,000	361,054	73,688,946	74,050,000	-	1%	Ongoing	Y		
Hellings Tank No. 2	Delta	29,411,000	5,267,075	24,143,925	29,411,000	-	18%	Ongoing	Y		
Jericho Reservoir No. 1	Langley Township	38,065,000	37,576,592	488,408	40,265,000	(2,200,000)	99%	Ongoing	Y	(c) (i)	
Kennedy Newton Main	Surrey	132,550,000	41,830,754	90,719,246	116,710,000	15,840,000	32%	Ongoing	N	(b)	Route selection delays.
Newton Pump Station No. 2	Surrey	50,800,000	4,508,167	46,291,833	50,800,000	-	9%	Ongoing	N		Property acquisition delays.
Newton Reservoir Connection	Surrey	27,050,000	-	27,050,000	27,050,000	-	0%	Not Started	Y		
Port Mann Main No. 2 (South)	Surrey	36,800,000	29,640,877	7,159,123	36,800,000	-	95%	Ongoing	Y		
South Surrey Main No. 2	Surrey	143,700,000	86,012	143,613,988	143,700,000	-	1%	Ongoing	Y		
South Surrey Main No. 2 Nickomekl Dam Prebuild	Surrey	2,000,000	-	2,000,000	2,000,000	-	0%	Not Started	Y		
Whalley Kennedy Main No. 2	Surrey	96,000,000	-	96,000,000	96,000,000	-	0%	Not Started	Y		
Whalley Main	Surrey	31,800,000	26,274,736	5,525,264	31,800,000	-	90%	Ongoing	Y		
		4,932,093,000	**203,479,997**	**4,728,613,003**	**4,915,453,000**	**16,640,000**					
Infrastructure Maintenance Capital											
Annacis Main No. 2 - Queensborough Crossover Improvement	New Westminster	1,200,000	-	1,200,000	1,200,000	-	0%	Not Started	Y	(f)	Likely not required. MOTI not planning on relocating Queensborough Main.
Annacis Main No. 3 BHP Potash Facility Pipe Protection	Surrey	600,000	-	600,000	600,000	-	0%	Not Started	Y	(f)	
Beach Yard Facility - Site Redevelopment	Dist of North Van	45,500,000	-	45,500,000	45,500,000	-	0%	Not Started	Y		
Boundary Road Main No. 2 & No. 3 Decommissioning	Burnaby	1,500,000	36,335	1,463,665	1,500,000	-	2%	Ongoing	Y		
Burnaby Mountain Main No. 2	Burnaby	10,200,000	-	10,200,000	10,200,000	-	0%	Not Started	Y		
Burnaby Mountain Pump Station No. 2	Burnaby	21,000,000	242,082	20,757,918	21,000,000	-	1%	Ongoing	N		Scope of work under review
Cape Horn Reservoir Condition Assessment and Structural Repair	Coquitlam	1,550,000	-	1,550,000	1,550,000	-	0%	Not Started	Y		
Capilano Main No. 5 (South Shaft to Lost Lagoon)	Vancouver	260,000,000	10,513,534	249,486,466	260,000,000	-	5%	Ongoing	N		Delayed due to project approval timelines.
Capilano Main No. 7 Line Valve & Swing Connection	Dist of North Van	2,100,000	1,938,963	161,037	2,100,000	-	92%	Ongoing	Y		
Capilano Raw Water Pump Station Bypass PRV Upgrades	Dist of North Van	1,500,000	54,129	1,445,871	1,500,000	-	4%	Ongoing	Y		
Capilano Watershed Security Gatehouse	Dist of North Van	2,300,000	516,396	1,783,604	2,175,000	125,000	22%	Ongoing	Y		
Central Park Main No. 2 (10th Ave to Westburnco)	Burnaby	28,350,000	-	28,350,000	28,350,000	-	0%	Not Started	N		Delayed due to project scope review.
Central Park Main No. 2 (Patterson to 10th Ave)	Burnaby	91,900,000	20,974,142	70,925,858	91,900,000	-	23%	Ongoing	Y		
Central Park Reservoir Structural Improvements	Burnaby	1,900,000	-	1,900,000	1,900,000	-	0%	Not Started	Y		
Central Park WPS Starters Replacement	Burnaby	8,000,000	991,729	7,008,271	8,000,000	-	12%	Ongoing	Y		
CLD & SFD Fasteners Replacement & Coating Repairs	Dist of North Van	2,100,000	776,260	1,323,740	2,100,000	-	75%	Ongoing	Y		
Cleveland Dam - Lower Outlet HBV Rehabilitation	Dist of North Van	4,900,000	1,194,370	3,705,630	4,900,000	-	24%	Ongoing	Y		
Cleveland Dam Drumgate Seal Replacement	Dist of North Van	1,250,000	269,208	980,792	1,250,000	-	22%	Ongoing	Y		
Coquitlam Pipeline Road Remediation	Coquitlam	2,000,000	799,496	1,200,504	2,000,000	-	40%	Ongoing	Y	(g)	
CWTP Ozone Sidestream Pipe Heat Trace and Insulation	Coquitlam	900,000	-	900,000	900,000	-	0%	Not Started	Y		
CWTP Ozone Sidestream Pump VFD Replacement	Coquitlam	1,400,000	19,916	1,380,084	1,400,000	-	1%	Ongoing	Y		
CWTP pH, Alkalinity Upgrades	Coquitlam	1,700,000	1,666,015	33,985	1,700,000	-	98%	Ongoing	Y		
Dechlorination for Reservoir Overflow and Underdrain Discharges	Burnaby	2,700,000	-	2,700,000	2,700,000	-	0%	Not Started	Y		
Douglas Road Main No. 2 - Kincaid Section	Burnaby	12,300,000	9,705,838	2,594,162	12,300,000	-	79%	Ongoing	N		Alignment changes.
Douglas Road Main No. 2 (Vancouver Heights Section)	Burnaby	21,486,000	19,747,748	1,738,252	21,486,000	-	92%	Ongoing	N	(b)	Procurement delays.
Douglas Road Main No. 2 Still Creek	Burnaby	63,100,000	4,752,738	58,347,262	63,100,000	-	8%	Ongoing	N		Alignment changes.
Douglas Road Main Protection	Burnaby	1,500,000	-	1,500,000	1,500,000	-	0%	Ongoing	Y	(f)	
E2 Shaft Phase 3	Dist of North Van	16,500,000	15,467,236	1,032,764	16,500,000	-	94%	Ongoing	Y		
First Narrows Tunnel Isolation Chamber Improvements	Dist of North Van	7,000,000	3,313,448	3,686,552	5,000,000	2,000,000	47%	Ongoing	Y	(a)(b)	
Improvements to Capilano Mains No. 4 and 5	Dist of North Van	1,700,000	107,495	1,592,505	1,700,000	-	6%	Ongoing	Y		
Kersland Reservoir No. 1 Structural Improvements	Vancouver	6,250,000	394,426	5,855,574	6,250,000	-	6%	Ongoing	Y		
Little Mountain Reservoir Roof Upgrades	Vancouver	3,450,000	181,141	3,268,859	3,450,000	-	7%	Ongoing	Y		
Lulu Island - Delta Main - Scour Protection Phase 2	Richmond	3,550,000	-	3,550,000	3,550,000	-	0%	Not Started	Y	(f)	
Lulu Island - Delta Main No. 2 (Marine Crossing)	Richmond	370,000,000	-	370,000,000	370,000,000	-	0%	Not Started	Y		

Metro Vancouver

ATTACHMENT 2

Water Services Capital Expenditures Summary
As of April 30, 2021

		Lifetime									
Project Name	**Project Location**	**Total Project Budget**	**Total Expenditures to Date**	**Remaining Budget**	**Total Projected Expenditures**	**Projected Remaining Budget**	**Percent Complete**	**Status**	**Project on Schedule?**	**Note**	**Comments**
Maple Ridge Main West Lining Repairs	Maple Ridge	3,500,000	190,470	3,309,530	3,500,000	-	7%	Ongoing	Y		Additional scope of work identified.
Newton Rechlorination Station No. 2	Surrey	5,000,000	-	5,000,000	5,000,000	-	0%	Not Started	N		Project delayed to coordinate with Newton Pump Station Project.
Port Mann Main No. 1 (Fraser River Crossing Removal)	Coq/Surrey	18,500,000	255,000	18,245,000	18,500,000	-	2%	Ongoing	Y		
Port Moody Main No. 1 Christmas Way Relocation	Coquitlam	2,350,000	-	2,350,000	2,350,000	-	0%	Not Started	Y	(f)	
Port Moody Main No. 3 Dewdney Trunk Rd Relocation	Coquitlam	2,700,000	(162)	2,700,162	2,700,000	-	1%	Ongoing	Y	(f)	
Port Moody Main No. 3 Scott Creek Section	Coquitlam	12,000,000	212,097	11,787,903	12,000,000	-	4%	Ongoing	Y		
Queensborough Main Royal Avenue Relocation	New Westminster	7,500,000	6,158	7,493,842	7,500,000	-	1%	Ongoing	Y		
Rechlorination Station SHS Storage Tank Replacement	Regional	1,200,000	129,530	1,070,470	1,200,000	-	11%	Ongoing	Y		
Rechlorination Station Upgrades	Regional	15,000,000	378,372	14,621,628	15,000,000	-	3%	Ongoing	Y		
Rehabilitation of AN2 on Queensborough Bridge	New West/Delta	2,500,000	11,361	2,488,639	2,500,000	-	1%	Ongoing	Y		
Relocation and Protection for MOTI Expansion Project Broadway	Vancouver	8,900,000	49,432	8,850,568	8,900,000	-	1%	Ongoing	Y	(f)	
Relocation and Protection for MOTI George Massey Crossing Replacement	Delta / Richmond	2,450,000	-	2,450,000	2,450,000	-	0%	Not Started	Y	(f)	
Relocation and Protection for Translink Expansion Project Surrey Langley SkyTrai	Surrey	6,600,000	-	6,600,000	6,600,000	-	0%	Not Started	Y	(f)	
Sapperton Main No. 2 North Road Relocation and Protection	Coquitlam	6,500,000	-	6,500,000	6,500,000	-	0%	Not Started	Y		
SCFP Centralized Compressed Air System	Dist of North Van	900,000	665	899,335	900,000	-	1%	Ongoing	Y		
SCFP Clearwell Membrane Replacement	Dist of North Van	17,400,000	-	17,400,000	17,400,000	-	0%	Not Started	Y		
SCFP Concrete Coatings	Dist of North Van	2,500,000	2,317,864	182,136	2,755,398	(255,000)	93%	Ongoing	Y	(j)	
SCFP OMC Building Expansion	Dist of North Van	2,650,000	9,274	2,640,726	2,650,000	-	1%	Ongoing	Y		
SCFP Polymer System Upgrade	Dist of North Van	3,450,000	448,726	3,001,274	3,450,000	-	14%	Ongoing	Y		
SCFP SCADA/ICS Controller Replacement	Dist of North Van	1,400,000	-	1,400,000	1,400,000	-	0%	Not Started	Y		
South Delta Main No. 1 - Ferry Road Check Valve Replacement	Delta	600,000	68,286	531,714	600,000	-	11%	Ongoing	Y		
South Surrey Main No. 1 Nickomekl Dam Relocation	Surrey	7,100,000	-	7,100,000	7,100,000	-	0%	Not Started	N	(f)	Project delayed (City of Surrey)
South Surrey Supply Main (Serpentine River) Bridge Support Modification	Surrey	400,000	79,469	320,531	400,000	-	20%	Ongoing	Y		
Sunnyside Reservoir Unit 1 Upgrades	Surrey	8,850,000	7,778,887	1,071,113	8,050,000	800,000	100%	Completed	Y	(b)	
Tilbury Main North Fraser Way Valve Addition	Burnaby	3,100,000	265,723	2,834,277	3,100,000	-	9%	Ongoing	Y		
Water Chamber Improvements and Repairs	Burnaby	2,000,000	-	2,000,000	2,000,000	-	0%	Not Started	Y		
Westburnco Pump Station No. 2 VFD Replacements	New Westminster	2,550,000	101,548	2,448,452	2,550,000	-	4%	Ongoing	Y		
		1,148,986,000	**105,965,346**	**1,043,020,654**	**1,146,316,398**	**2,670,000**					
Infrastructure Resilience Capital											
Barnston/Maple Ridge Pump Station - Back-up Power	Pitt Meadows	9,000,000	240,156	8,759,844	9,000,000	-	3%	Ongoing	Y		
Burnaby Mountain Tank No. 2	Burnaby	21,650,000	45,415	21,604,585	21,650,000	-	1%	Ongoing	Y		
Burnaby Mountain Tank No. 3	Burnaby	21,400,000	-	21,400,000	21,400,000	-	0%	Not Started	Y		
Cambie Richmond Main No. 3 (Marine Crossing)	Richmond/Van	490,250,000	1,340,153	488,909,847	490,250,000	-	1%	Ongoing	Y		
Cape Horn Pump Station 2 - Back-Up Power	Coquitlam	8,000,000	88,069	7,911,931	8,000,000	-	1%	Ongoing	Y		
Capilano Mid-Lake Debris Boom	Dist of North Van	750,000	-	750,000	750,000	-	1%	Ongoing	Y		Tender has been awarded
Capilano Raw Water Pump Station - Back-up Power	Dist of North Van	33,000,000	6,407,247	26,592,753	33,000,000	-	19%	Ongoing	N		Site selection delays.
Capilano Reservoir Boat Wharf	Dist of North Van	850,000	-	850,000	850,000	-	8%	Ongoing	Y		Tender document completeion in progress
Clayton Langley Main No. 2	Surrey	16,900,000	-	16,900,000	16,900,000	-	0%	Not Started	Y		
Cleveland Dam Power Resiliency Improvements	Dist of North Van	1,700,000	25,177	1,674,823	1,700,000	-	1%	Ongoing	Y		
Cleveland Dam Seismic Stability Evaluation	Dist of North Van	800,000	-	800,000	800,000	-	0%	Not Started	Y		
Coquitlam Intake Tower Seismic Upgrade	Coquitlam	26,000,000	1,100,993	24,899,007	26,000,000	-	4%	Ongoing	Y		
Critical Control Sites - Back-Up Power	Regional	1,800,000	-	1,800,000	1,800,000	-	0%	Not Started	Y		
CWTP Ozone Back-up Power	Coquitlam	7,450,000	-	7,450,000	7,450,000	-	0%	Not Started	Y		
Emergency Power Strategy for Regional Water Facilities	Regional	400,000	-	400,000	400,000	-	0%	Ongoing	Y		Project terms of reference under development. Expected completion Q4 of 2021
Grandview Pump Station Improvements	Surrey	2,600,000	199,901	2,400,099	2,600,000	-	8%	Ongoing	Y		
Haney Main No. 4 (Marine Crossing)	P.Coq/P.Meadows	390,250,000	235,112	390,014,888	390,250,000	-	1%	Ongoing	Y		
Mackay Creek Debris Flow Mitigation	Dist of North Van	9,700,000	9,023,693	676,307	9,700,000	-	93%	Ongoing	N		Delays due to challenging ground conditions.
Pebble Hill Pump Station Seismic Upgrade	Delta	1,800,000	-	1,800,000	1,800,000	-	0%	Not Started	N	(e)	Coordinating with City of Delta.
Pebble Hill Reservoir No. 3 Seismic Upgrade	Delta	9,500,000	356,321	9,143,679	9,500,000	-	4%	Ongoing	Y		
Pebble Hill Reservoir Seismic Upgrade	Delta	14,800,000	422,949	14,377,051	12,800,000	2,000,000	3%	Ongoing	N	(b)	Design delays due to geotechnical conditions.
Reservoir Isolation Valve Automation	Regional	6,450,000	1,149,196	5,300,804	6,450,000	-	18%	Ongoing	Y		Delayed due to scope refinement.
Scour Protection Assessments and Construction General	Regional	4,000,000	-	4,000,000	4,000,000	-	0%	Not Started	Y		
Second Narrows Crossing (Tunnel)	Burnaby/DNV	468,550,000	231,707,255	236,842,745	468,550,000	-	49%	Ongoing	N		Construction taking longer than anticipated
Seymour Falls Boat Wharf	Dist of North Van	800,000	-	800,000	800,000	-	11%	Ongoing	Y		Tender document completeion in progress
Seymour Lake Debris Boom	Dist of North Van	800,000	-	800,000	800,000	-	36%	Ongoing	Y		Tender document completeion in progress
Seymour Main No. 2 Joint Improvements	Dist of North Van	5,252,000	488,220	4,763,780	5,252,000	-	16%	Ongoing	N		Work delayed to coordinate with Second Narrows Crossing
Seymour Main No. 5 III (North)	Dist of North Van	236,900,000	4,244,835	232,655,165	236,900,000	-	2%	Ongoing	Y		
Seymour Reservoir Mid-Lake Debris Boom	Dist of North Van	2,300,000	161,961	2,138,039	2,300,000	-	8%	Ongoing	Y		
Sunnyside Reservoir	Surrey	19,300,000	7,472,318	11,827,682	19,300,000	-	42%	Ongoing	Y		

Metro Vancouver

ATTACHMENT 2

Water Services Capital Expenditures Summary
As of April 30, 2021

Project Name	Project Location	Lifetime Total Project Budget	Lifetime Total Expenditures to Date	Lifetime Remaining Budget	Lifetime Total Projected Expenditures	Lifetime Projected Remaining Budget	Percent Complete	Status	Project on Schedule?	Note	Comments
Vancouver Heights System Resiliency Improvements	Burnaby	1,500,000	-	1,500,000	1,500,000	-	0%	Not Started	Y		
Westburnco Pump Station - Back-up Power	New Westminster	23,500,000	977,932	22,522,068	23,500,000	-	4%	Ongoing	N		Design delay, scope modification.
		1,837,952,000	**265,686,900**	**1,572,265,100**	**1,835,952,000**	**2,000,000**					
Infrastructure Upgrade Capital											
CWTP Ozone Generation Upgrades for Units 2 & 3	Coquitlam	7,000,000	2,791,708	4,208,292	7,000,000	-	40%	Ongoing	N		Delay due to operational requirements.
Lower Seymour Conservation Reserve Learning Lodge Replacement	Dist of North Van	5,000,000	597,764	4,402,236	5,000,000	-	12%	Ongoing	Y		
Online Chlorine Monitoring Stations	Regional	4,150,000	-	4,150,000	4,150,000	-	0%	Not Started	Y		
Sapperton Main No. 1 New Line Valve and Chamber	New Westminster	3,800,000	868,373	2,931,627	3,800,000	-	23%	Ongoing	N		Tie-ins delayed
South Delta Main No. 1 - 28 Ave to 34B Ave	Delta	22,650,000	18,464,225	4,185,775	22,650,000	-	97%	Ongoing	N		Construction delays due to unforeseen environmental and geotechnical conditions.
South Delta Mains - 28 Ave Crossover	Delta	10,500,000	10,213,321	286,680	10,500,000	-	97%	Ongoing	N		Utility conflicts and additional scope of work.
Tilbury Junction Chamber Valves Replacement with Actuators	Richmond	5,600,000	4,374,234	1,225,766	5,600,000	-	78%	Ongoing	Y		
Water Meter Upgrades	Regional	22,400,000	3,706,632	18,693,368	22,400,000	-	17%	Ongoing	N		Procurement delays.
Water Optimization - Flow Meters (Non-billing) Phase 1	Regional	16,500,000	-	16,500,000	16,500,000	-	0%	Not Started	Y		
Water Optimization - Flow Meters (Non-billing) Phase 2	Regional	19,500,000	-	19,500,000	19,500,000	-	0%	Not Started	Y		
Water Optimization - Instrumentation	Regional	11,400,000	-	11,400,000	11,400,000	-	0%	Not Started	Y		
Water Optimization Automation & Instrumentation	Regional	9,540,000	7,536,816	2,003,184	9,540,000	-	79%	Ongoing	N		Procurement delays.
		138,040,000	**48,553,073**	**89,486,927**	**138,040,000**	**-**					
Opportunity Capital											
Capilano Hydropower	Dist of North Van	114,250,000	218,368	114,031,632	114,250,000	-	1%	Ongoing	N		Project currently on hold
		114,250,000	**218,368**	**114,031,632**	**114,250,000**	**-**					
Grand Total Water Services		**8,171,321,000**	**623,903,684**	**7,547,417,316**	**8,150,011,000**	**21,310,000**					

Notes:

(a) Contingency not required.
(b) Construction costs lower than estimated.
(c) City of Surrey share - 33.72%, Township of Langley share - 66.28%.
(d) Project cancelled.
(e) Cost sharing proposal with City of Delta
(f) Project start is dependent on a 3rd party. External agency yet to begin work.
(g) GVWD Cost Share City of Coquitlam, Fortis and BC Hydro
(h) Extent of construction scope less than originally anticipated.
(i) Design change/consutant
(j) Extent of construction scope increased

ATTACHMENT 3

Capital Project Status Information
April 30, 2021

GREATER VANCOUVER WATER DISTRICT (Water Services)

Major GVWD capital projects are generally proceeding on schedule and within budget. The following capital program items and exceptions are highlighted:

Infrastructure Growth Program

- **Annacis Main No. 5 (Marine Crossing)** – A 2.3 km long, 4.5 metre diameter water supply tunnel is required under the Fraser River to meet growing water demand south of the Fraser and to provide increased system resiliency. Detailed design, which was awarded to Hatch Corporation, is now complete. Property acquisition along the tunnel alignment is nearing completion, and construction management services have been awarded. The RFP for construction was issued in April 2020 and will close in late June. Construction is anticipated to commence in early 2022.

- **Annacis Main No. 5 (South)** – This project comprises approximately 3.0 km of 1.8 metre diameter steel pipe connecting the south shaft of the Annacis Water Supply Tunnel to the Kennedy Reservoir in the City of Surrey. Preliminary design has been completed and detailed design is in progress and expected to be complete in February 2022.

- **Cape Horn Pump Station No. 3** – Cape Horn Pump Station No. 3 with a back-up power system, will supplement the existing pump station to deliver Coquitlam source water to meet growing demand in the municipalities south of the Fraser River. Preliminary design of the new station started Q1 2020 and is expected to be complete Q3 2021.

- **Coquitlam Intake No. 2** – A new intake, tunnel and treatment plant are proposed at the Coquitlam Reservoir to increase the regional supply from this source and meet growing future demand. The Draft Project Definition Report was received in December 2019. A Value Engineering workshop was held in May 2020 to review options to reduce risks, confirm costs and improve the schedule. The Final Project Definition Report, which will incorporate suitable options identified in the Value Engineering, is expected to be completed in July 2021.

- **Coquitlam Main No. 4** – This 12 km long steel water main, consisting of the Central, South and Cape Horn Sections, will increase the transmission capacity from the Coquitlam source to the Cape Horn Pump Station and Reservoir in the City of Coquitlam. This project is required to address capacity constraints in the existing Coquitlam transmission system and also provide additional transmission capacity for the Coquitlam Intake No. 2. Detailed design of the Central and South Sections continues. A Request for Proposal for the 2.3 km tunnel portion of the South Section will be issued in June 2021. Detailed design of the Cape Horn section is now underway.

- **Fleetwood Reservoir** – Phase 1 of the Fleetwood Reservoir project includes a 13.6 ML reservoir, valve chamber, piping, access building and associated work located at Meagan Ann MacDougall Park in the City of Surrey. Detailed design is complete. The City of Surrey is finalizing the Property

Lease Agreement and a Coordinated Works Agreement to include a portion of the city water main in the tender package. Construction is expected to commence in Q3 2021.

- **Jericho Reservoir** – Phase 1 of the Jericho Reservoir project includes a 20.6 ML reservoir, chambers, piping and associated work located at 20400 73A Avenue in the Township of Langley. Construction is approximately 95% complete. Tie-ins and commissioning of the valve chamber are complete. The reservoir is scheduled to enter service in July 2021.

- **Kennedy Newton Main** – This project comprises approximately 9.0 km of 1.8 metre diameter steel water main between the Kennedy Reservoir and the Newton Reservoir in the City of Surrey and is divided into 3 phases. Construction of Phase 1, between 72nd Avenue and 84th Avenue, is complete. Construction of Phase 2, between 72nd Avenue and Newton Reservoir commenced in September 2020. Design of the remaining Phase 3, from 84th Avenue to Kennedy Reservoir, is in progress and expected to be completed in November 2021.

- **Newton Pump Station No. 2** – This project, located at 6287 128th Street in the City of Surrey, consists of replacing the existing Newton Pump Station and includes full back-up power redundancy, connections to existing and future infrastructure, and installation of new outlets to the existing Newton Reservoir. The preliminary design phase was completed in December 2019 and detailed design is in progress with completion expected in October 2021. Construction is anticipated to start in Summer 2022.

- **Port Mann Main No. 2 (South)** – This 2.8 km long, 1.5 metre diameter steel water main will twin the existing Port Mann Main No. 1 between the south shaft of the Port Mann Water Supply Tunnel and the Whalley Main in the City of Surrey. The project is required to meet growing water demand south of the Fraser River. The main installation construction contract was completed in July 2020 with final tie-ins and commissioning planned for summer/fall 2021.

- **Whalley Main** – This 2.0 km long, 1.5 metre diameter steel main will twin the existing Whalley Clayton Main between the Whalley Reservoir and the Whalley Kennedy Link Main in the City of Surrey. The main installation construction contract commenced in June 2019 and Substantial Completion was achieved on March 2021. Tie-ins and commissioning are planned to commence in fall 2021.

<u>Infrastructure Maintenance Program</u>

- **Douglas Road Main No. 2 – Still Creek Section** - This project comprises approximately 2.5 km of 1.5 metre diameter steel pipe with trenchless crossings of Highway 1, Still Creek and the BNSF rail line. The water main alignment has been finalized in consultation with the City of Burnaby. The detailed design phase is in progress and the required rights of ways are in the process of being finalized. The Project is planned to be constructed in three phases, with the North Open Cut Section commencing in June 2021. Design of the Trenchless Crossing Section is complete with construction planned to start in fall 2021. Design of the South Open Cut Section is underway.

  Douglas Road Main No. 2 – Vancouver Heights Section - This project comprises approximately 2.0 km of 1.5 metre diameter steel pipe connecting the Vancouver Heights Reservoir to the Douglas Road Main No. 2 at Beta Avenue and Albert Street in the City of Burnaby. The installation construction contract is complete. Final tie-ins and commissioning are planned for fall 2021.

- **Central Park Main No. 2 – Patterson to 10th Ave** - This project comprises approximately 7.0 km of 1.2 metre diameter steel pipe connecting the Central Park Pump Station in Burnaby to the existing Central Park Main in New Westminster at 10th Avenue. The water main is divided into three phases with the 500 m long Maywood Pre-build completed in December 2020. Construction of Phase 1 of the project commenced in October 2020 with completion anticipated in mid-2021. Design of Phase 2 is underway and is expected to be complete in fall 2021.

- **E2 Shaft Replacement** – The E2 Shaft, which has controlled ground water in the East Abutment of Cleveland Dam since the 1950's is nearing the end of its service life and needs to be replaced by a system of horizontal drains. A total of 6 horizontal drains have been completed, and continue to be monitored. The project consultants and Technical Review Board have analyzed the information. No additional drains are required at this time. The project is now complete.

- **Capilano Main No. 5 (Stanley Park Section)** – This 1.4 km long steel water main, in a tunnel, will replace the aged existing Capilano Main No. 4 through Stanley Park to meet growing water demand and provide increased system resiliency. Detailed design is nearing completion. The procurement phase for construction will commence in late 2021, with construction anticipated to start in late 2022.

<u>Infrastructure Resilience Program</u>

- **Mackay Creek Debris Flow Mitigation** – Detailed design and construction engineering services for this project were awarded to BGC Engineering Inc. The construction contract was awarded to BEL Contracting. Construction commenced in spring 2019 and was completed in March 2020. Site replanting began in fall 2020 and is expected to be completed in late 2021.

- **Second Narrows Water Supply Tunnel** – This project comprises a 1.1 km long, 6.5 metre diameter water supply tunnel under Burrard Inlet, between North Vancouver and Burnaby, to increase the reliability of supply in the event of a major seismic event and provide additional long term supply capacity. The contract for construction was awarded to the Traylor-Aecon General Partnership in October 2018. Construction of the north shaft is complete and construction of the south shaft is substantially complete. The Tunnel Boring Machine began tunnel excavation in the fall of 2020 and the tunnel is now approximately 40% complete.

- **Capilano Raw Water Pump Station – Back-up Power** – This project consists of installing diesel generators to provide 8 MW of back-up power to the pump station. Shop drawing submittals for the pre-purchased electrical equipment are ongoing, with a portion of the equipment already delivered. Construction is anticipated to start early 2022 with overall project completion in 2024.

- **Coquitlam Intake Tower Seismic Upgrade** – The Coquitlam Intake Tower is located in the southeast corner of the Coquitlam Reservoir. Constructed in 1913, the tower provides the GVWD its primary intake of water from Coquitlam Reservoir. The Tower is a 27 metre-high and 5.5 metre diameter unreinforced concrete structure, founded on bedrock. Detailed design of the seismic upgrade is 60% complete. Completion of detailed design is expected at the end of 2021. Due to coordination with BC Hydro work and water supply operations, construction will be completed over two winter periods 2024 - 2026.

- **Pebble Hill Reservoir No. 1, 2 and 3 Seismic Upgrade** – Pebble Hill Reservoir in south Delta is comprised of three units. Detailed design for the seismic upgrade is complete. Construction is scheduled to be completed in stages, taking only one unit out of service at any time. Construction of Units 1 and 2 has been awarded and will commence in fall of 2021

- **Westburnco Pump Station – Back-up Power** – This project consists of installing diesel generators to provide 5 MW's of back-up power to the pump station. Preliminary design was completed in 2019 and detailed design continues in 2021 and 2022.

Infrastructure Upgrade Program

- **Coquitlam Ozone Upgrade** – This project consists of upgrades to the ozone generators at the Coquitlam Water Treatment Plant. The generators for units 1 and 2 have been replaced and are in service. Unit 3 will be upgraded in Q3 2021

45510102

To: Water Committee

From: Lucas Pitts, Acting Director, Policy, Planning and Analysis, Water Services

Date: June 23, 2021 Meeting Date: July 15, 2021

Subject: **Regional Water Conservation Impacts on Capital Planning**

RECOMMENDATION

That the Water Committee receive for information the report dated June 23, 2021, titled "Regional Water Conservation Impacts on Capital Planning".

EXECUTIVE SUMMARY

Metro Vancouver has some of the highest per capita water use when compared to other cities in Canada. From 2000–2019, the service population of the GVWD has grown by 642,000 with per capita water consumption steadily declining. However, it is expected that over the next 20 years overall water consumption will begin to steadily increase as the limits of reductions from improvements in plumbing efficiencies, public awareness and increased density are being reached. If Metro Vancouver is able to drive increased conservation measures, it may be possible to delay the construction of the Coquitlam Lake Water Supply Project and potentially other capital projects. To achieve that, per capita consumption will need to drop below 200 litres per capita per day. This could be achieved through a strengthened Drinking Water Conservation Plan, increased awareness and enforcement of Water Conservation Bylaws, conservation-oriented pricing structures, and water metering, supported by behaviour change campaigns.

PURPOSE

This information report provides Water Committee with current water use statistics as well as predictions for future residential water use and their impacts on capital planning.

BACKGROUND

As identified in the *Water Supply Outlook 2120* study, mounting stresses on Metro Vancouver's water supply are occurring because of growing populations, urbanization and climate change. Of those threats, climate change poses the biggest uncertainty to the overall water supply. Precipitation forecasts indicate drier summers that could extend later into the year. Hotter days and longer dry spells over the summer months, combined with a reduction in the snowpack, could put a strain on the existing water supply during times of the year when temperatures are high and water is in greatest demand. Potentially, many different solutions exist to manage and meet these challenges. Metro Vancouver will address these vulnerabilities over time with planned increases in supply and storage capacity, including the construction of a second intake in the Coquitlam Reservoir that can access increased storage volumes to deeper depths. However, investing in capital infrastructure is expensive and Metro Vancouver may be able to delay some of the capital projects if we implement best practices to more sustainably manage residential, industrial, commercial and agricultural use of drinking water.

WATER DEMAND PLANNING

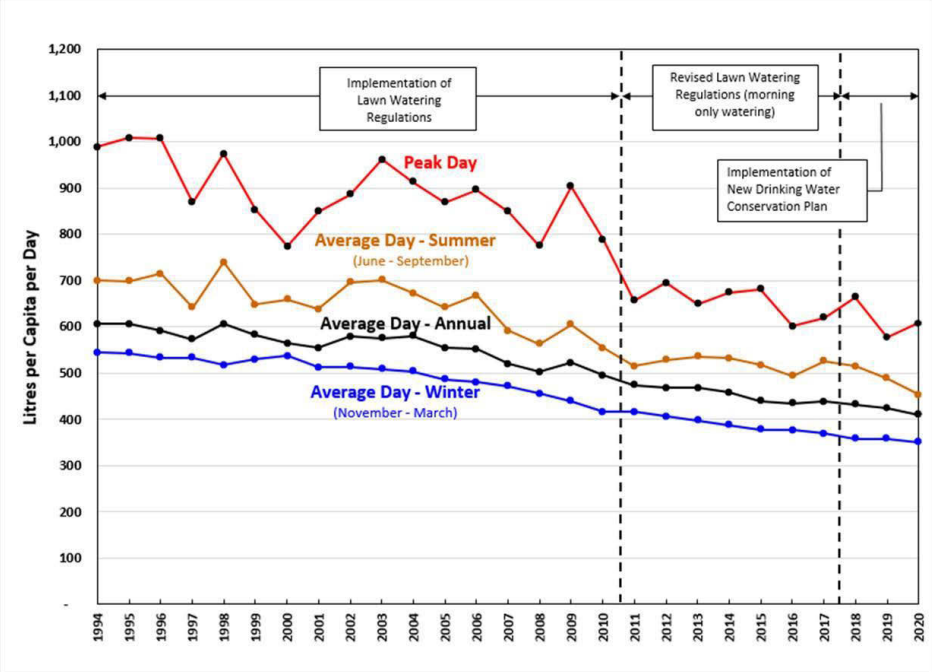
Metro Vancouver per capita has some of the highest residential water consumption when compared to other major municipalities in Canada, as shown in Figure 1.

Figure 1 – Comparison of Residential per Capita Consumption (2019)

	Average Residential Consumption (LPCD)	Residential Metered Connections %
Capital Regional District	232	100%
Metro Vancouver	247	31%
Winnipeg	149	100%
Edmonton	176	100%
Calgary	206	100%
City of Toronto	210	100%
Portland, Oregon	173	100%

Over the last 20 years (2000–2019), the service population of the GVWD has grown by 642,000, at an annual growth rate of approximately 1.7%. In comparison, as shown in Figure 2, the per capita water consumption has been steadily declining. It is expected that over the next 20 years' overall water consumption will begin to steadily increase. This is because the limits of reductions from improvements in plumbing efficiencies, public awareness and increased density are being reached. Most communities across Canada saw comparable declines over the last 20 years for similar reasons.

Figure 2 – Regional Water Use 1994-2020



In 2016, Metro Vancouver undertook a *Comprehensive Regional Water System* study that considered various demand scenarios over the next 100 years to predict when potential shortages in water supply would occur. The timing for the next increment of supply was identified for the mid-2030s. The results of this study were used to prepare the *Water Supply Outlook 2120* report that confirmed the Coquitlam Lake Water Supply Project as the most cost-effective option for increasing supply. The results of that study are presented below in Figure 3.

Figure 3 – Comprehensive Water System Study 2036 Predicted Demand Factors

Item	**2016**	**2036 (Predicted range)**
Population (millions)	2.5	3.1 - 3.4
Total Water Demand (BL)	394	405 - 443
Residential Per Capita Demand (L/Capita/Day)	268	202 - 212
Water Demand on MV (BL)	383	393 - 441
Annual Water Supply Gap (BL)	0	5 - 55
Demand and Supply Uncertainties: Growth, density, conservation effectiveness, water supply variability, water quality, climate change		

The modelling made several assumptions on regional efforts to reduce water consumption over the period from 2016 to 2036. As can be seen, the per capita consumption is predicted to decline from 268 Litres per Capita per day (LPCD) to a range between 202 – 212 LPCD. The per capita decline in water consumption was expected to be achieved primarily by increased metering, increased conservation, increased density and improved plumbing efficiencies. With those reductions included, the study identified a potential water supply gap of between 5-55 BL identified in the three scenarios modelled. The *Water Supply Outlook 2120* used these results to identify the mid-2030s for the timing of the Coquitlam Lake Water Supply Project.

Options

It may be possible to defer the completion of the Coquitlam Lake Water Supply Project, and potentially other capital projects if regional conservation efforts reduce overall water demand by more than the modelling predictions. To achieve that, per capita consumption will need to drop below 200 L/Cap/Day by 2036 and would require a concerted regional effort to ramp up conservation initiatives. This could include updating and strengthening the Drinking Water Conservation Plan, enforcement of Water Conservation Bylaws, conservation-oriented pricing structures, behaviour change campaigns, enhanced educational efforts, and increased adoption of water metering. It should be noted, however, that should the region fail to achieve the conservation efforts identified in the modelling then there will be an additional risk of experiencing a seasonal supply shortage in the coming decade. It is important to note that Metro Vancouver cannot accomplish this on its own, concerted efforts regionally from member jurisdictions will be required in order to achieve any water conservation goals.

In 2021 Metro Vancouver will be working closely with our member jurisdictions to potentially strengthen the Drinking Water Conservation Plan to allow for the banning of lawn watering during drought years while limiting impacts on local businesses.

ALTERNATIVES
This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS
This is an information report. No financial implications are presented.

CONCLUSION
Decision-making for growth projects should always seek to ensure that all possible measures are considered to defer projects to reduce the household impact from increasing water rates. The *Comprehensive Regional Water System* study and the *Water Supply Outlook 2120* identify the mid-2030s for the next increment in water supply for the Region (Coquitlam Lake Water Supply Project). To potentially defer this project, and other growth-related projects, a concerted regional effort will be required to reduce overall water consumption especially during the peak summer season where water consumption typically increases by 50% or more. Metro Vancouver will be working closely with its member jurisdictions to identify ways to reduce regional water consumption.

Reference
Water Supply Outlook 2120

43287903

To: Water Committee

From: Lucas Pitts, Acting Director, Policy, Planning and Analysis, Water Services

Date: June 30, 2021 Meeting Date: July 15, 2021

Subject: **Residential Water Metering – Overview of Local Experience**

RECOMMENDATION

That the Water Committee receive for information the report dated June 30, 2021, titled "Residential Water Metering – Overview of Local Experience".

EXECUTIVE SUMMARY

Water metering is recognized as a best management practice strategy to achieve water conservation goals. Metro Vancouver continues to have low uptake of universal residential water metering amongst member jurisdictions which has contributed to some of the highest per capita residential water consumption in the country. Metro Vancouver has provided tools to member jurisdictions following a comprehensive regional assessment completed in 2019 to support them with the implementation of residential water metering programs.

PURPOSE

This report provides the Water Committee with an update on select member jurisdictions' water metering efforts and the impacts of the metering implementation on their residential water consumption.

BACKGROUND

Water metering is recognized as a best practice strategy to achieve water conservation goals. Residential water metering and conservation oriented pricing has the potential to address a number of challenges including billing equity, water consumption, leak detection, system planning, and asset management. Management of dammed river systems includes an obligation to provide downstream flows adequate to sustain freshwater and estuarine ecosystems. Water conservation is essential to ensuring we have access to high quality water that can be used to achieve environmental flow needs. This becomes increasingly important during the dry, hot summer months when this water is critical to sustaining vulnerable fish populations. Unmetered systems with flat fee structures do not incentivise water conservation and makes effective system planning challenging.

Studies have shown that a correlation exists between the extent of universal metering and the average daily per capita consumption. When compared to other jurisdictions, as shown in Table 1 below, the Metro Vancouver region was found to have one of the highest residential Litres per Capita per Day (LPCD) consumption rates while concurrently having the lowest level of metering in the residential sector.

Table 1: Comparison of 2019 Residential LPCD and Percent Metered Connections

City/Region	Average Residential Consumption (LPCD)	Residential Metered Connections %
Capital Regional District	232	100%
Metro Vancouver	247	31%
Winnipeg	149	100%
Edmonton	176	100%
Calgary	206	100%
City of Toronto	210	100%
Portland, Oregon	173	100%

Metro Vancouver previously commissioned a two-part project to re-evaluate the business case for water metering. The project culminated in informative documents and useful tools, the *Residential Water Metering in Metro Vancouver Best Practices Guide for Local Governments* and a *Water Metering Evaluation Tool and Users Guide*. These were provided to all member jurisdictions in December 2019 to help inform them about the potential implementation of metering programs in the region.

LOCAL CONTEXT

Member jurisdictions develop programs and adopt rate structures appropriate to their needs, which include unit rate, declining or inclining block rates (block rates are rates set for certain volumes of water used), seasonal and flat fee structures. As part of the regional assessment project, Metro Vancouver conducted a survey to gauge the perceptions and attitudes of residents towards water metering in the region. The survey found that 86% of respondents:

- supported the concept of paying for water based on usage versus a flat fee; and
- believed such a system will increase awareness of water usage, will be more equitable and will provide an incentive to reduce water usage.

It is generally observed that low-income households can end up subsidizing the water use of higher-income households when a flat fee structure is in place.

Metro Vancouver asked some member jurisdictions to provide feedback on their residential metering programs. The feedback received is summarized in Table 2.

Table 2: Comparison of Select Member Jurisdiction Residential Metering Programs

Member Jurisdiction	Metering Program Status as of 2019	Single Family Percentage Metered	Metered Rate Structure	Observed Impacts – Single Family Residential Sector
City of Vancouver	Ongoing	10%	Seasonal Pricing ($/m^3 unit rate + meter rental).	• reduced consumption.
City of Surrey	Ongoing	> 65%	$/m^3 unit rate (one block)	• improved planning.
City of Richmond	Completed	100%	$/m^3 unit rate (one block).	• reduced consumption; • Reduced bills for households who use less water; • timely leak detection and repair.
District of West Vancouver	Completed	100%	$/m^3 (four inclining blocks).	• reduced consumption; • customer savings; • leak detection
City of Langley	Completed	100%	$/m^3 unit rate (one block).	• timely leak detection and repair; • billing efficiencies; • reduced consumption.
Village of Belcarra	Ongoing	70%	$/m^3 unit rate (one block).	• Meters installed, not used; unmetered flat fee applied.

Member jurisdictions' experience:

City of Vancouver:

City of Vancouver enforces mandatory metering for new construction through development regulations and bylaws. In 2010, there were 689 single-family metered connections which was roughly 1% of all serviced connections in the city. By 2020, the single-family metered connections had increased to 10% of all serviced connections. The City of Vancouver also utilizes a seasonal price structure to promote water conservation between June and September with a unit rate for metered customers and varying annual flat fees for unmetered homes.

City of Surrey

Since 2018, the City of Surrey has more than 65% of its single-family connections metered. This is attributed to the bylaws on new construction introduced in 1999 and the voluntary metering program that began in 2002. The City has noted improvements in its capital planning from the data obtained from metered connections.

City of Richmond
The City of Richmond began a voluntary metering program in 2003 and is now 100% metered. As of 2018, approximately 82% of single-family households saved an average of 47% on their water bills as compared to a flat fee. This also resulted in the City achieving a cost reduction of $10 million in water and sewer charges due to reduced water consumption.

District of West Vancouver
The District of West Vancouver implemented metering between 2003 and 2007 with a block rate structure. In recent years, it has been observed that water consumption increased in the lower blocks with a corresponding decrease in the highest block. An overall reduction in consumption was also observed during the summer months. In 2021, the District introduced larger rate increases in the high-use blocks to further encourage water conservation.

City of Langley
The City of Langley has had universal metering since 2007 with separate unit rates for each of the residential and industrial sectors. Conservation pricing has not been implemented, although the City notes an increased ability to identify and correct leakages on the consumer side, billing efficiencies and a noticeable reduction in water consumption.

ALTERNATIVES
This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS
This is an information report. No financial implications are presented.

CONCLUSION
Water metering is recognized by the industry as a best management practice to achieve reductions in water consumption when coupled with conservation-oriented pricing. The Metro Vancouver region has one of the highest average daily consumption per capita and the lowest level of metering in the residential sector. The City of Richmond, the City of Langley, and the District of West Vancouver are observing reduced water consumption and savings for some residents since implementing universal residential water metering programs.

References
1. Regional Assessment of Residential Water Metering Technical Report – September 2019
2. 2020 Report for Water Committee Water Rates and Consumption
3. GVWD and Local Government Water Use by Sector Report 1985 - 2017.
4. 2018-10-04 Residential Water Rates in Metro Vancouver compared with other regions
5. 2018 Water Consumption Statistics Report
6. District of West Vancouver, Council Report September 23 2020 "Proposed 'Waterworks Regulation Bylaw No. 4490, 2006, Amendment Bylaw No. 5093, 2020'"
7. City of Richmond, Report to Committee, March 21 2019, "Water Meter Program & Sewer Rate Update"

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