Myles Lamont
Director at Large
WildResearch Society

Attn: Liquid Waste Committee
MetroVancouver

08 June 2020

Dear Ms. Knaupp,

Please find below a summary of the concerns we wish to present as a delegation to the Liquid Waste Committee on July 16, 2020:

WildResearch is a registered charity comprised of young professional biologists and volunteers with an interest in wildlife conservation issues across Canada, and more generally within the Greater Vancouver region. WildResearch's mission is to build, train, and educate a community that contributes to conservation science, and we have been doing such at Iona Island Regional Park since 2010.

Over the last decade we have invested hundreds-of-thousands of staffing dollars and tens of thousands of hours of volunteer time to collect data relating to avian migration through Iona Island Bird Observatory (IIBO). In 2018 alone, we had over 80 volunteers at IIBO, contributing 1700 volunteer hours and directly engaged over 500 visitors to the park through our visitor outreach and education programs. Additionally, WR has been directly involved with restoration efforts on the island and have paid for BCIT students to undertaken studies on this same topic to the ultimate benefit of the park and MetroVancouver.

WildResearch considers IIBO to be its flagship program, given the significant resource investments the organization has made into this location over the last ten years.

The proposed, long-term and significant changes for the upgrading of the Iona Island Waste Water Treatment Plant will have substantial impacts on both the operation of IIBO at its current location and potentially throughout the course of the planned ten year construction and development of this project site.

As a result of these planned and extensive disturbances to our various IIBO programs, we would like the opportunity to present these challenges to your committee and highlight the potential ramifications that might come as a result of this project.

We would like to prepare some PowerPoint slides during our presentation and ideally will have someone attend in person to present these.

On behalf of the board of directors,

Myles Lamont

phone: 778-772-0626 | 2258 Oxford St. Vancouver, B.C. Canada, V5L 1G1 | www.wildresearch.ca

Georgia Strait Alliance
Caring for Our Coastal Waters

June 1, 2020

Metro Vancouver Liquid Waste Committee
Metrotower III
4730 Kingsway
Burnaby, BC
V5H 0C6

Dear committee members,

We thank you for the opportunity to comment on the Iona Island Wastewater Treatment Plant Project (the Project) and recognize the great lengths that the Metro Vancouver team is taking to continue the Project, collect public input and overcome the serious challenges presented by the COVID-19 pandemic.

In the accompanying submission, we offer recommendations for the Project, aimed at preserving the integrity of the Salish Sea's aquatic ecosystems, marine biodiversity and coastal communities. Our recommendations are grounded in years of experience working to keep the region's waterways healthy, in support of those who rely on them most. The realization of these recommendations in the Project's final design would signal the Committee's movement towards much needed progressive environmental leadership and control a significant source of contaminants that cause harm to the Salish Sea and its inhabitants.

Georgia Strait Alliance (GSA) is a regional charitable organization that works to protect and restore the marine environment and promote the sustainability of the Strait of Georgia, one of Canada's most at-risk environments, and its adjoining waters and communities. Founded in 1990, GSA has over 18,000 members and supporters who work collectively to address root causes of threats to the Strait and find solutions that protect it.

Obabika is an environmental non profit organization working to amplify the voices of environmental efforts in British Columbia.

During our combined 35 years as advocates for the Salish Sea, the protection of wild salmon and at-risk species, including endangered Southern Resident orcas, has been a common thread. The health of wild salmon in particular is an indicator of the health of the region's ecosystems and coastal communities. That is why we have long been strongly in favour of national regulations and source control programs to reduce marine contamination in the marine and freshwater environments. This has included our advocacy for region-wide tertiary wastewater treatment.

Research shows overwhelmingly that contaminants negatively impact marine ecosystems. Sex ratios for fish populations living downstream from wastewater plants have been skewed because of wastewater effluent containing pharmaceuticals flowing into their habitat. Locally, pollution in the Salish Sea is putting Pacific salmon at risk and causing immune and endocrine system dysfunction in Southern Resident orcas.

Effluent from the Iona Island Plant flows into the Salish Sea at the mouth of the Fraser River. This effluent can carry persistent, bioaccumulative toxins including (but not limited to) PCBs, DDT, PFOS, PFOA, copper, phthalates, bisphenols, and current use pesticides, from household and industrial

sources. A significant body of scientific knowledge shows that these contaminants are of major concern to Chinook salmon and endangered Southern Resident orcas. This list of contaminants was recently validated by the federal government's Southern Resident orca Contaminants Technical Working Group, which was convened to develop strategies to mitigate the threat of marine contaminants to Southern Resident orcas and their prey. The Technical Working Group also identified wastewater effluent as a main source of several of these contaminants.

The Project represents one of the single greatest opportunities to considerably quell this known source of pollution to Salish Sea's waterways. It is imperative that the environmental impact of the treatment measures under consideration for the Project are made clear to the committee. Incorporating, at a minimum, tertiary treatment methods that specifically target the above list of contaminants can help reverse the decline of the Southern Residents – of which only 72 remain. Additionally, constructing infrastructure to better treat the 8-10% of influent that receives treatment at or below the primary level during overflow or wet weather events, as indicated by Rick Bitcon at the May 19 Community Meeting, would also be beneficial as even the release of small quantities of contaminants can cause decades of harm to marine ecosystems.

We recognize that the cost of tertiary treatment presents a barrier. The following costs must be considered should only secondary treatment be included in the Project's final design:

- Cost of the loss of Salish Sea ecosystem function due to contamination;
- Economic impact on the region's ecotourism sector and fisheries, both of which have been devastated by the COVID-19 pandemic;
- Cost of the decline of the health of the region's marine wildlife and coastal communities; and the
- Future cost for the cleanup of contaminants and microplastics that will enter the Salish Sea via effluent from the Iona Island Plant.

Treating wastewater at the Iona Island Plant to the tertiary level at a minimum, and as soon as possible before the 2030 deadline, will prevent the above environmental costs and protect the health of the Salish Sea, its surrounding communities and inhabitants. Anything less than a tertiary treatment process would directly oppose Vancouver's Greenest City initiative and the federal Coastal Restoration Fund, as well as continue the flow of harmful contaminants into local waters. The Salish Sea and Fraser River are sensitive, ecologically important areas that are under ongoing stress and this is an opportunity to reduce that stress. The health of these invaluable places relies on decision-makers like you to take action that will offer the protection so desperately needed.

Thank you for considering our recommendations.

Regards,

Tessa Danelesko
Biodiversity Program Coordinator
Georgia Strait Alliance

Zack Shoom
Founding Director
Obabika Consultant Society

July 1, 2020
Metro Vancouver Liquid Waste Committee
Metrotower III
4730 Kingsway
Burnaby, BC
V5H 0C6

Dear Metro Vancouver Liquid Waste Committee members,

Firstly, thank you for your time, and the opportunity to comment on the pending upgrades to Iona Island Treatment Plant. We understand the last few months have been trying for everyone, and appreciate Metro Vancouver's ability to accommodate community input.

With our upcoming submission for the July 16th committee meeting, we will state and explain our views on renovations, and inclusion of tertiary treatment to Iona Island Waste Water Treatment Plant.

Over the past 9 months we have worked with a number of community groups, environmental groups, and industry professionals to better understand what is in our wastewater, and how treatment plants can affect the surrounding environment of Iona Island. This includes endangered Southern Resident Killer Whales, endangered wild salmon, migratory birds, and nearly half a million recreating people each year.

Treating wastewater at the Iona Island Plant to the tertiary level at a minimum, as soon as possible before the 2030 deadline, will prevent significant environmental costs and protect the health of the Salish Sea, Fraser River, and its surrounding communities and inhabitants. Anything less than a tertiary treatment process would directly oppose Vancouver's Greenest City initiative and the federal Coastal Restoration Fund, as well as continue the flow of harmful contaminants into local waters.

The health of these invaluable places relies on decision-makers like you to take action that will offer the protection so desperately needed.

Thank you for you time, and I look forward to *virtually* meeting you all on July 16th.

Zack Shoom
Founding Director,
Obabika

metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Liquid Waste Committee

From: Peter Navratil, General Manager, Liquid Waste Services
Dean Rear, Chief Financial Officer/General Manager, Financial Services

Date: June 24, 2020 Meeting Date: July 16, 2020

Subject: **Board Budget Workshop – Overview and Next Steps for Liquid Waste Services**

RECOMMENDATION

That the Liquid Waste Committee receive for information the report dated June 24, 2020, titled "Board Budget Workshop – Overview and Next Steps for Liquid Waste Services".

EXECUTIVE SUMMARY

On June 5, 2020 a Board Budget Workshop was held with the objective to seek direction for the preparation of the 2021-2025 Financial Plan. The Board provided direction to staff to bring back adjustments to the Five Year Financial Plan that places increased emphasis on financial sustainability, provides short-term relief for households, maintains work on current goals and objectives, and allows the organization to realize new opportunities in terms of partnering on projects to meet Board objectives.

In response to this direction, staff will prepare budgets with options and alternatives to respond to the direction and address the concerns raised by the Board. A short-term action plan is being developed with detailed scrutiny being applied to the Liquid Waste Services budget and financial practices to ensure upward pressure on the household impact is minimized while continuing to focus on key Liquid Waste Services initiatives.

PURPOSE

To provide the Liquid Waste Committee with an overview of the Board Budget Workshop held June 5, 2020, including the Board direction to staff, and the next steps and considerations for Liquid Waste Services.

BACKGROUND

On June 5, 2020 a Board Budget Workshop was held with the objective to seek direction for the preparation of the 2021-2025 Financial Plan. The workshop outlined the principles that guide the work of Metro Vancouver as an organization, the current 2020-2024 Financial Plan, the implications of the COVID-19 pandemic, the tools that can be used to make budget adjustments, and a proposed approach for the 2021-2025 Financial Plan.

Based on the input received from the Board, staff are putting together options for the 2021 Budget and Five Year Financial Plan. This report provides an overview of the workshop and discusses next steps and specific considerations for Liquid Waste Services.

BOARD BUDGET WORKSHOP - OVERVIEW

The Board Budget Workshop presentation (see Reference) outlined the principles that guide Metro Vancouver's long-term work, the current Five Year Outlook, the implications of COVID-19, and the tools available to make budget adjustments going forward.

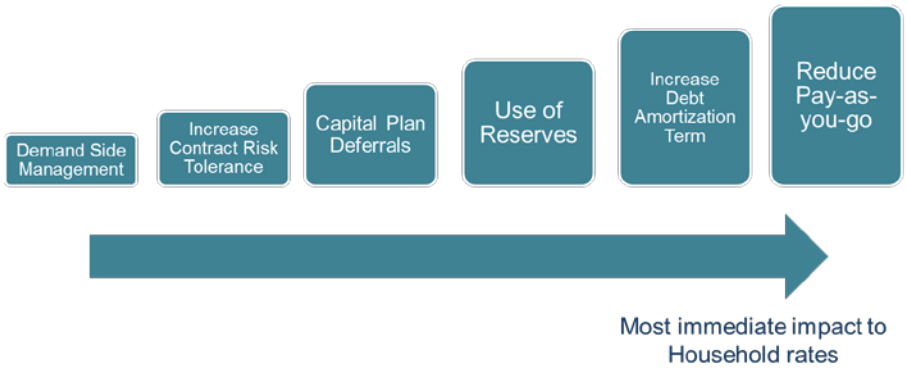
Current Five Year Outlook

The following key points were covered for the current Five Year Outlook:

- Increases to costs of operations, such as that for Water or Liquid Waste Treatment Plants, are generally consistent with inflation
- Capital Funding, through Contributions to Capital from the operating budget and debt service for the capital program consistently drives the increase in the operating budget and the household impact
- Due to the long timeframe associated with the capital program, a significant portion of the capital spend over the next five years is due to projects already underway (80% in 2021 to 66% in 2024)
- The household impact is set to increase by 6.7%-8.9%
- Utility rates are generally consistent with similar jurisdictions in Canada and the US

Toolbox

Several tools were presented that would allow for reductions in household rates, but would require tradeoffs in terms of impacting the financial strength of the organization or increasing the risk to the organization. As shown in the diagram below, changes to how the organization approaches funding capital projects would have the most immediate effect on household impact. However, careful consideration will need to be given as to the long-term implications of such changes on future household impacts.



Proposed Approach

Staff proposed leveraging the supported tools to create a short-term action plan that would lessen the upward pressure on household impact for 1-3 years. A short-term action plan would enable strategic goals and objectives to be maintained. If larger or more long-term adjustments are desired, a re-evaluation of long-term plans such as the *Metro Vancouver Housing Plan*, *Climate 2050*, or the *Liquid Waste Management Plan* would be required.

Since an annual budget is approved, this approach will allow for adjustments to be made each year as conditions change based on market changes and other factors. The use of the tools will aim to avoid making severe changes that cannot be easily corrected in the short-term.

WORKSHOP DISCUSSION

Discussion at the workshop gave Board members the opportunity to raise concerns regarding the current Five Year Financial Plan and provide input on adjustments to be made going forward.

Key themes discussed include:

- The increasing household impact and member's ability to pay
- The importance of financial sustainability
- The "growth pays for growth" principle
- Assumptions built into capital projects, including the right sizing of projects and the amount of risk taken on by the organization
- Long-term impacts of changes to amortization of debt
- Maintaining momentum on climate action initiatives

Overall, the short-term action plan approach was supported. As requested by the Board, staff will be bringing back a set of options to address the concerns raised, including the implications of the different options.

NEXT STEPS

Staff are working on the creation of a short-term action plan that would allow the continuation of work on current goals and objectives, but would lessen the upward pressure on household impact for regional ratepayers.

Staff are exploring all viable avenues for budget adjustments, with consideration given to the following:

- Actions that can provide immediate relief while maintaining the work on the long-term vision of the Board
- Risk implications for project delays or deferrals
- The impact of changes to debt amortization on future ratepayers
- The ability of the organization to take advantage of potential stimulus funding

Liquid Waste Services Considerations

Staff will be applying a detailed scrutiny of the Liquid Waste Services budgets and financial practices to ensure upward pressure on the Household Impact is minimized while continuing to focus on key Liquid Waste Services initiatives.

In preparing the 2021 Budget, Liquid Waste Services will carefully consider the following:

- Reviewing the capital program to find opportunities to modify or defer projects, reducing costs in the near term.
- Reduce discretionary costs in programs such as travel and training.
- Integrating new revenues from realized business cases.
- Leverage efficiency savings from continuous improvement work.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

At this time, staff are evaluating the financial implications of budget adjustments to be made for Liquid Waste Services in response to the direction received from the Board. Staff will be reporting back on options for the 2021 Budget and Five Year Financial Plan this fall.

CONCLUSION

On June 5, 2020 a Board Budget Workshop was held with the objective to seek direction for the preparation of the 2021-2025 Financial Plan. The Board expressed concerns regarding the increasing household impact and residents' ability to pay, assumptions built into capital projects, and being able to maintain work on the objectives of the Board. In response to the direction received, staff will be creating a set of options to address the concerns of the Board. Staff are aiming to create a short-term action plan that would reduce the household impact for regional ratepayers. Options and alternatives will aim to balance relief for households with the financial health and overall risk to the organization.

References: Board Budget Workshop Presentation – June 5, 2020

39671522

To: Liquid Waste Committee

From: Colin Meldrum, Acting Director, Project Delivery, Liquid Waste Services

Date: June 22, 2020 Meeting Date: July 16, 2020

Subject: **Liquid Waste Services Capital Program Expenditure Update as of April 30, 2020**

RECOMMENDATION

That the Liquid Waste Committee receive for information the report dated June 22, 2020, titled "Liquid Waste Services Capital Program Expenditure Update as of April 30, 2020".

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 report for 2020 which includes the overall capital program for Liquid Waste Services with a multi-year view of capital projects, and the actual capital spending for the 2020 fiscal year to April 30, 2020 in comparison to the prorated annual budget. As of April 30, the 2020 capital expenditures for Liquid Waste Services are $150.2 million, compared to a prorated annual capital budget of $294.5 million.

Forecasted expenditures for the current Liquid Waste Services capital program remain within the approved budgets.

PURPOSE

To report on the status of the Liquid Waste Services' capital program and financial performance for the 2020 fiscal year to April 30, 2020.

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 the following year.

This is the first in a series of three reports for 2020 and looks at both the overall capital program for Liquid Waste Services with a multi-year view of capital projects and the actual capital spending for the 2020 fiscal year to April 30, 2020 in comparison to the prorated annual budget.

2020 CAPITAL EXPENDITURES

Capital Program Funding

The capital spending for Liquid Waste Services is funded through the Liquid Waste Operating Budget by a combination of contribution to capital (pay-as-you-go funding) and debt service costs (principal and interest payments) which is generated annually from the regional ratepayers. 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 Liquid Waste 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.

Table 1 in Attachment 1 provides a summary of Liquid Waste 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 as required. Attachment 3 provides additional project status information for some of the key projects included in Attachment 1 – Table 1.

2020 Capital Program Progress

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.

As of April 30, 2020 capital expenditures for Liquid Waste Services were$150.2 million compared to the prorated annual capital budget of $294.5 million. The total annual capital budget for 2020 is $883.4 million.

The underspend is due to a variety of factors, primarily due to Covid-19, although projects under construction will see the majority of their expenditures materialize later in the year. Additionally, invoicing by contractors lags financial reporting by at least one month, resulting in an apparent underspend, whereas in reality work has been completed but not paid.

Several projects have been delayed in tendering due to Covid-19, in part to ensure that work would not be adversely affected by the pandemic once under contract. Some additional delays are due to delays in permitting and protracted property negotiations.

Table 2 in Attachment 1 provides a summary of the 2020 actual capital spending compared to the Board approved Capital Budget.

Capital Program Impacts from COVID-19

During these unprecedented times of health and economic uncertainty, all departments are monitoring the impacts of the pandemic on their operations. This includes capital program expenditures.

Overall, the impact to the Liquid Waste Service's capital program has largely been schedule related, with few notable impacts to project expenditures confirmed to date. Staff are monitoring impacts on

their projects regularly. Any 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 financing. As capital expenditures are incurred, short term financing is secured and converted twice per year to long term debt through the Municipal Finance Authority. If capital expenditures are less than budgeted for the year, this surplus, per policy, will be used in future years to fund capital and avoid debt.

CONCLUSION
This is the first in a series of three reports on capital expenditures for 2020. Although the 2020 Liquid Waste Services Capital expenditures lag the pro-rated budget, the variance is a result of cash flow timing, with a number of projects expected to see the bulk of the expenditures in the second half of the year. Any surplus resulting from a 2020 underspend will be used to directly fund capital in 2021 and avoid future borrowing.

Attachments
1. Liquid Waste Services Capital Expenditure Summary as at April 30, 2020
2. Detailed Capital Expenditure Summary – Liquid Waste Services
3. Liquid Waste Services Capital Project Status Information

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Metro Vancouver

Capital Expenditure Summary
Liquid Waste Services
As at April 30, 2020

Table 1 – Ongoing and Completed Project Summary

	Total Projected to Completion	Total Budget	Projected Variance
Liquid Waste Services			
Ongoing	$ 6,761,644,000	$ 6,761,684,000	$ 40,000
Completed	5,099,000	5,230,000	131,000
Not Started	325,505,000	325,505,000	-
	$ 7,092,248,000	**$ 7,092,419,000**	**$ 171,000**

Table 2 – 2020 Capital Spending Summary

	2020 Budget	Actual Expenditures to April 30, 2020
Liquid Waste Services		
Infrastructure Growth Capital	$ 294,550,000	$ 26,598,906
Infrastructure Maintenance Capital	150,250,000	8,983,315
Infrastructure Resilience Capital	24,700,000	5,179,611
Infrastructure Upgrade – Advanced Treatment Capital	352,870,000	104,587,658
Infrastructure Upgrade Capital	49,200,000	3,533,102
Opportunity Capital	11,850,000	1,356,907
	$ 883,420,000	**$ 150,239,499**

Metro Vancouver
Liquid Waste Services Capital Expenditures Summary
As of April 30, 2020

ATTACHMENT 2

Project	Project Location	Lifetime Total Project Budget	Lifetime Total Expenditures to Date	Lifetime Remaining Budget	Lifetime Projected Expenditures	Lifetime Projected Remaining Budget	Lifetime Percent Complete	Status	Project on Schedule?	Note	Comments
Infrastructure Growth Capital											
AIWWTP Site Construction Layout	Delta	600,000	92,334	507,666	600,000	-	15%	Ongoing	N		Delayed start to earlier phase.
Albert Street Trunk Sewer	Port Moody	5,550,000	3,213,297	2,336,703	8,050,000	(2,500,000)	58%	Ongoing	Y	(6)	Higher costs are expected due to challenging ground conditions, a switch to tunnelling, and a longer length of sewer.
Annacis Outfall System	Delta	378,000,000	77,744,595	300,255,405	378,000,000	-	21%	Ongoing	Y		
Annacis Stage 5 Expansion Phase 1 T1 & T2	Delta	243,500,000	233,692,323	9,807,677	243,500,000	-	96%	Ongoing	Y		
Annacis Stage 5 Expansion Phase 2	Delta	22,000,000	16,205,915	5,794,085	22,000,000	-	74%	Ongoing	Y		
Annacis Stage 5 Expansion Phase 2a	Delta	180,000,000	138,696,299	41,303,701	180,000,000	-	77%	Ongoing	Y		
Annacis Stage 5 Expansion Phase 2b	Delta	150,000,000	1,940,497	148,059,503	150,000,000	-	1%	Ongoing	Y		
Annacis Stage 5 Expansion Phase 2c	Delta	90,000,000	-	90,000,000	90,000,000	-	0%	Not Started	Y		
Burnaby Lake North Interceptor Cariboo Section	Burnaby	41,000,000	-	41,000,000	41,000,000	-	0%	Not Started	N		Delayed to prioritize the Winston (upstream) section.
Burnaby Lake North Interceptor Winston Section	Burnaby	116,950,000	3,536,818	113,413,182	116,950,000	-	3%	Ongoing	Y		
Burnaby South Slope Interceptor West Branch Extension	Burnaby	13,200,000	-	13,200,000	13,200,000	-	0%	Not Started	Y		Scheduled to start in 2021
Cloverdale Pump Station Capacity Upgrade	Surrey	36,400,000	207,595	36,192,405	36,400,000	-	1%	Ongoing	N		Slight delay to determine scope of upgrades
Cloverdale Trunk Sewer Capacity Upgrade	Surrey	29,000,000	-	29,000,000	29,000,000	-	0%	Not Started	Y		Scheduled to start in 2022
Glenbrook Combined Trunk Kingsway Sanitary Section	Burnaby	4,500,000	174,240	4,325,760	4,500,000	-	4%	Ongoing	Y		
Golden Ears Forcemain and River Crossing	Maple Ridge	86,000,000	4,706,536	81,293,464	86,000,000	-	5%	Ongoing	Y	(1)(2)	
Golden Ears Pump Station	Maple Ridge	50,200,000	3,767,146	46,432,854	50,200,000	-	8%	Ongoing	Y		
Golden Ears SSO Storage	Maple Ridge	51,500,000	5,445,182	46,054,818	51,500,000	-	11%	Ongoing	Y		
Hastings Sanitary Trunk Sewer	Burnaby	15,031,000	11,454,300	3,576,700	14,903,000	128,000	76%	Ongoing	Y	(1)(2)	
Hastings Sanitary Trunk Sewer No. 2	Burnaby	20,000,000	6,520,362	13,479,638	9,145,000	10,855,000	33%	Ongoing	Y	(1)(2)	
Hastings-Cassiar Intake Connection	Vancouver	2,350,000	77,933	2,272,067	2,350,000	-	3%	Ongoing	N		Project delayed by one year to accommodate expanded scope (remotely operated gate) to improve functionality.
Lulu Island WWTP Digester No 3	Richmond	53,300,000	1,393,377	51,906,623	53,300,000	-	3%	Ongoing	N	(4)	Project may be cancelled and funds repurposed
Marshend Pump Station Capacity Upgrade	Burnaby	13,775,000	520,521	13,254,479	13,775,000	-	4%	Ongoing	Y		
NLWWTP Ground Improvements	Langley Township	83,000,000	25,918,432	57,081,568	83,000,000	-	31%	Ongoing	Y		
NLWWTP Outfall	Langley Township	159,000,000	6	158,999,994	159,000,000	-	1%	Ongoing	Y		
NLWWTP Property Purchase	Langley Township	12,000,000	-	12,000,000	12,000,000	-	0%	Not Started	Y		Scheduled to start in 2021
NLWWTP Stage 1	Langley Township	889,000,000	7,219,820	881,780,180	889,000,000	-	1%	Ongoing	Y		
North Road Trunk Sewer	Coquitlam	11,675,000	4,673,238	7,001,762	11,675,000	-	40%	Ongoing	Y		
North Road Trunk Sewer Phase 2	Coquitlam	8,438,000	728,649	7,709,351	8,438,000	-	9%	Ongoing	Y		Project construction deferred until 2022-2023.
North Vancouver Interceptor - Lynn Branch Pre-build	Dist of North Van	3,950,000	294,446	3,655,554	3,950,000	-	7%	Ongoing	Y		
NSI 104th Ave Extension	Surrey	6,800,000	4,938,694	1,861,306	6,800,000	-	73%	Ongoing	Y		
NSI Flow Management	Surrey	63,200,000	4,335,529	58,864,471	63,200,000	-	7%	Ongoing	N		Project delayed to improve scope definition and delivery method.
Port Moody Pump Station Capacity Upgrade	Port Moody	10,550,000	479,073	10,070,927	10,550,000	-	5%	Ongoing	N		Project delayed to confirm scope.
Port Moody South Interceptor Capacity Upgrade	Port Moody	3,450,000	-	3,450,000	3,450,000	-	0%	Not Started	Y		Scheduled to start in 2021
Rosemary Heights Pressure Sewer Capacity Upgrade	Surrey	10,750,000	-	10,750,000	10,750,000	-	0%	Not Started	Y		Scheduled to start in 2021
Sapperton Pump Station	New Westminster	82,003,000	64,258,939	17,744,061	75,003,000	7,000,000	78%	Ongoing	N	(1)	Project experiencing minor delays due to construction issues. Commissioning expected in Q4 2020.
South Surrey Interceptor Johnston Section	Surrey	84,026,000	47,574,043	36,451,957	84,026,000	-	57%	Ongoing	N		Final section delayed due to protracted property and permitting issues.
Sperling PS Increase Pump Capacity	Burnaby	3,150,000	2,470,280	679,720	2,800,000	350,000	78%	Ongoing	Y	(2)	
SSI - King George Section - Odor Control Facility (OCF) and Grit Chamber	Surrey	19,500,000	9,794,958	9,705,042	19,500,000	-	50%	Ongoing	N		Project is proceeding at a slower pace than expected due to construction issues.
		3,053,348,000	**682,075,375**	**2,371,272,625**	**3,037,515,000**	**15,833,000**					
Infrastructure Maintenance Capital											
AIWWTP Cogen Building Refurbishment	Delta	1,500,000	-	1,500,000	1,500,000	-	0%	Not Started	N	(4)	Project on hold pending completion of the Cogen Backup Power Project.
AIWWTP Fibre Optic Infrastructure	Delta	1,500,000	143,837	1,356,163	1,500,000	-	10%	Ongoing	Y		
AIWWTP ICS Replacement Program	Delta	14,350,000	-	14,350,000	14,350,000	-	0%	Not Started	N		Late start to give way to Stage V Activities.
AIWWTP Influent System Remediation	Delta	82,600,000	185,756	82,414,244	84,000,000	(1,400,000)	0%	Ongoing	Y	(6)	
AIWWTP IPS Pump Building Roof Replacement Phase 2	Delta	830,000	-	830,000	830,000	-	0%	Not Started	N	(4)	Deferred to 2024 based on results of detailed condition assessment.
AIWWTP Outfall Repair	Delta	1,800,000	-	1,800,000	1,800,000	-	0%	Not Started	N	(4)	Scope review underway to account for new inspection information.

Metro Vancouver
Liquid Waste Services Capital Expenditures Summary
As of April 30, 2020

		Lifetime									
Project	Project Location	Total Project Budget	Total Expenditures to Date	Remaining Budget	Projected Expenditures	Projected Remaining Budget	Percent Complete	Status	Project on Schedule?	Note	Comments
AIWWTP Replacement of ICS Equipment in Galleries	Delta	2,895,000	1,441,996	1,453,004	2,895,000	-	50%	Ongoing	Y		
AIWWTP Scheduled 64kV Potential & Current Transformer Replacements	Delta	800,000	-	800,000	800,000	-	0%	Not Started	N		Anticipated to start in 2020.
AIWWTP SCL Flow Balancing	Delta	2,450,000	913,895	1,536,105	2,450,000	-	37%	Ongoing	Y		
AIWWTP SCL Flow Control	Delta	31,500,000	3,166,835	28,333,165	31,500,000	-	10%	Ongoing	Y		
AIWWTP Scum Pump Replacement	Delta	1,350,000	-	1,350,000	1,350,000	-	0%	Not Started	N	(4)	Project on hold pending completion of the primary sedimentation tank portion of Annacis Stage 5
AIWWTP Secondary Effluent Discharge Flowmeter Replacement	Delta	400,000	37,552	362,448	400,000	-	9%	Ongoing	Y		
AIWWTP Spare Trickling Filter Pump & Motor Purchase	Delta	1,950,000	-	1,950,000	1,950,000	-	0%	Not Started	N	(3)	
AIWWTP Station Battery Replacement - PHASE 2	Delta	400,000	78,550	321,450	400,000	-	20%	Ongoing	Y		
AIWWTP Trickling Filter Media & Distributor Arms & Ducting Replacement	Delta	90,700,000	2,621,704	88,078,296	90,700,000	-	3%	Ongoing	Y		
Annacis MCC 80 051, 80 070, 80 071 Replacement	Delta	2,844,000	1,662,571	1,181,429	2,844,000	-	58%	Ongoing	Y		
Annacis Secondary Clarifier Corrosion Repair and Leveling Phase 2	Delta	22,000,000	7,907,672	14,092,328	22,000,000	-	36%	Ongoing	Y		
Big Bend Forcemain - Gate Replacement	Richmond	2,680,000	70,209	2,609,791	2,680,000	-	3%	Ongoing	N		Implementation Phase deferred to 2024
Cambie Trunk Sewer Relocation for Broadway Subway Project	Vancouver	4,500,000	-	4,500,000	4,500,000	-	0%	Ongoing	N		Project scope to be further defined after design/build team selected.
Combined Sewer Overflow Sampling Station Enhancements	Regional	1,900,000	127,536	1,772,464	1,900,000	-	7%	Ongoing	Y		
Cost Allocation Billing Network (Combined 96 F4)	Regional	5,230,000	5,098,591	131,409	5,099,000	131,000	100%	Completed	Y		
Crescent Beach FM - Replacement	Surrey	25,570,000	2,003,084	23,566,916	25,570,000	-	8%	Ongoing	Y		
English Bay/Balaclava Outfalls Improvement	Vancouver	900,000	-	900,000	900,000	-	0%	Not Started	Y		Scheduled to start in 2021.
FSA Flow Metering Program	Regional	3,500,000	653,256	2,846,744	3,500,000	-	19%	Ongoing	Y		
Gilbert/Brighouse Trunk Pressure Sewer Rehab Phase 5	Richmond	23,200,000	-	23,200,000	23,200,000	-	0%	Not Started	Y		Scheduled to start in 2023.
Gilbert/Brighouse Trunk Pressure Sewer Twinning Phase 2	Richmond	50,501,000	31,291,765	19,209,235	50,501,000	-	62%	Ongoing	Y		
Gilbert/Brighouse Trunk Pressure Sewer Twinning Phase 3	Richmond	44,400,000	13,959,067	30,440,933	44,400,000	-	31%	Ongoing	Y		
Gilbert/Brighouse Trunk Pressure Sewer Twinning Phase 4	Richmond	41,400,000	1,010,031	40,389,969	41,400,000	-	2%	Ongoing	Y		
Glen Eagles Forcemains Replacement Phase 2	West Vancouver	7,750,000	245,944	7,504,056	7,750,000	-	3%	Ongoing	Y		
Glen Eagles Pump Stations Phase 1	West Vancouver	22,500,000	499,828	22,000,172	22,500,000	-	2%	Ongoing	Y		
Glen Eagles Pump Stations Phase 2	West Vancouver	5,000,000	-	5,000,000	5,000,000	-	0%	Not Started	Y		Scheduled to start in 2022
Harbour West & East Interceptors Reloc & Protect	Vancouver	19,500,000	4,196	19,495,804	19,500,000	-	1%	Ongoing	Y		
IIWWTP Digester 4 Roof Replacement & Mixing Replacement	Richmond	24,800,000	15,311,975	9,488,025	24,800,000	-	62%	Ongoing	Y		
IIWWTP Grit System Refurbishment	Richmond	8,100,000	7,492,699	607,301	8,100,000	-	93%	Ongoing	Y		
IIWWTP ICS IPS Control Replacement	Richmond	1,750,000	385	1,749,615	1,750,000	-	1%	Ongoing	Y		
IIWWTP ICS Replacement Program	Richmond	750,000	-	750,000	750,000	-	0%	Ongoing	Y		
IIWWTP Influent Gate Refurbishment	Richmond	1,350,000	175,592	1,174,408	1,350,000	-	13%	Ongoing	Y		
IIWWTP IPS Drive Remediation	Richmond	800,000	-	800,000	800,000	-	0%	Not Started	N	(4)	Awaiting completion of Options Analysis study.
IIWWTP MCC/Power Distribution Assess/Replace - Phase 2	Richmond	1,000,000	598,164	401,836	800,000	200,000	60%	Ongoing	Y	(2)	
IIWWTP PA-Sed Tank & Gallery Wall Refurbishment	Richmond	1,375,000	-	1,375,000	1,375,000	-	0%	Not Started	N		Work delayed to confirm scope of repair.
IIWWTP Replacement of CoGen Control System	Richmond	2,470,000	957,424	1,512,576	2,470,000	-	39%	Ongoing	Y		
IIWWTP Siphon Chamber Refurbishment	Richmond	2,200,000	-	2,200,000	2,200,000	-	0%	Not Started	N		Project delayed to allow improved coordination of other related works and improve safe operating conditions for work site.
IIWWTP Solids Handling Refurbishment	Richmond	30,500,000	29,995,505	504,495	30,436,000	64,000	98%	Ongoing	Y	(2)	
Iona Island Control & Instrumentation Replacement 2011	Richmond	2,750,000	1,943,162	806,838	2,750,000	-	71%	Ongoing	Y		
LIWWTP CCT Isolation Gates	Richmond	2,050,000	338,857	1,711,143	2,050,000	-	17%	Ongoing	Y		
LIWWTP High Efficiency Boiler	Richmond	1,330,000	81,064	1,248,936	1,330,000	-	6%	Ongoing	N	(4)	Deferred to after Biogas Cleanup Project is completed and in operation.
LIWWTP ICS Replacement Program	Richmond	6,750,000	-	6,750,000	6,750,000	-	0%	Ongoing	Y		
LIWWTP PA-Sed Tank Refurbishment	Richmond	4,115,000	18,939	4,096,061	4,115,000	-	0%	Ongoing	Y		
LSA Flow Metering Program	Richmond	300,000	76,399	223,601	300,000	-	25%	Ongoing	Y		
Marshend PS Rehab	Burnaby	7,000,000	836,904	6,163,096	7,000,000	-	12%	Ongoing	N		Project delayed to confirm scope.
New West Interceptor Grit Chamber	New Westminster	8,250,000	214,125	8,035,875	8,250,000	-	3%	Ongoing	Y		
New Westminster Interceptor Repair Columbia St. Section	New Westminster	10,882,000	1,018,205	9,863,795	26,037,000	(15,155,000)	9%	Ongoing	Y	(6)	Project length increased substantially (300%) due to additional investigations
NLWWTP Screw Pump Replacement	Langley City	1,550,000	151,316	1,398,684	1,550,000	-	10%	Ongoing	Y		
NSA Flow Metering Program	West Vancouver	900,000	112,711	787,289	900,000	-	13%	Ongoing	Y		
NSI Rehab or Replacement	Surrey	46,950,000	760,092	46,189,908	46,950,000	-	2%	Ongoing	N		Project delayed to improve scope definition, and coordination with other works.
NWI - Annacis Section 2 Improvement	Delta	45,000,000	267,709	44,732,291	45,000,000	-	1%	Ongoing	N		Project delayed to improve scope definition, and coordination with other works.
NWL WWTP 25 kV Substation Replacement	Langley Township	10,025,000	3,640,322	6,384,678	9,475,000	550,000	36%	Ongoing	Y	(1)	
Ocean Park Trunk Crescent Section (OPC) Pipe Rehabilitation/Replacement	Surrey	4,953,000	242,038	4,710,962	4,953,000	-	5%	Ongoing	N		Property acquisition delays.
Ocean Park Trunk Manholes Lining	Surrey	550,000	-	550,000	550,000	-	0%	Not Started	N		Scheduled to start in 2021

Metro Vancouver
Liquid Waste Services Capital Expenditures Summary
As of April 30, 2020

Project	Project Location	Lifetime Total Project Budget	Lifetime Total Expenditures to Date	Lifetime Remaining Budget	Lifetime Projected Expenditures	Lifetime Projected Remaining Budget	Lifetime Percent Complete	Status	Project on Schedule?	Note	Comments
Port Coquitlam Pump Station Refurbishment	Port Coquitlam	9,250,000	-	9,250,000	9,250,000	-	0%	Not Started	N		Scheduled to start in 2021
Royal Ave PS Rehabilitation	New Westminster	7,238,000	1,082,546	6,155,454	7,238,000	-	15%	Ongoing	N		Scope to be reviewed pending final result of hydraulic study.
Sewer Relocations and Protections at Fraser Surrey Docks	Surrey	25,800,000	-	25,800,000	25,800,000	-	0%	Not Started	N		Scheduled to start in Fall 2020.
Sewer Relocations and Protections for Pattullo Bridge Replacement Project	New Westminster	7,000,000	-	7,000,000	7,000,000	-	0%	Ongoing	N		Project start based on 3rd party bridge contractor.
SSI Influent Control Chamber Repair and Replace Gates	Delta	1,305,000	13,554	1,291,446	1,305,000	-	1%	Ongoing	Y		
Surrey Corrosion Control Facility Replacement	Surrey	2,900,000	143,646	2,756,354	2,900,000	-	5%	Ongoing	N		Project delayed to resolve siting issues.
VSA Flow Metering Program	Regional	5,800,000	336,168	5,463,832	5,800,000	-	6%	Ongoing	Y		
Westridge FM Replacement	Burnaby	3,650,000	357,402	3,292,598	3,472,000	178,000	10%	Ongoing	Y	(7)	
Westridge Pump Stations 1 & 2 Refurbishment	Burnaby	16,250,000	286,465	15,963,535	16,250,000	-	2%	Ongoing	Y		
Works Yard	Burnaby	32,000,000	-	32,000,000	32,000,000	-	0%	Not Started	N		
		858,043,000	**279,154,489**	**578,888,511**	**873,475,000**	**(15,432,000)**					
Infrastructure Resilience Capital											
AIWWTP 69 kV Substation Modifications	Delta	8,500,000	325,832	8,174,168	2,350,000	6,150,000	4%	Ongoing	Y	(1)(2)	Project under expenditure as BC Hydro requirements less than anticipated.
AIWWTP Cogeneration Backup Power	Delta	75,003,000	64,170,559	10,832,441	72,003,000	3,000,000	86%	Ongoing	Y	(1)(2)	
AIWWTP PST Area Walkway & Column Remediation	Delta	3,100,000	1,216,510	1,883,490	3,100,000	-	39%	Ongoing	Y		
AIWWTP UPS Condition Monitoring System	Delta	550,000	-	550,000	550,000	-	0%	Not Started	N	(4)	Construction on hold until resolution of design issues.
IIWWTP - Biogas Lines Relocation	Richmond	5,780,000	2,615,834	3,164,166	4,780,000	1,000,000	75%	Ongoing	N	(1)(2)	Delay caused by contractor's inability to secure approvals, materials, and resources in an efficient manner to meet stated schedule.
IIWWTP Standby Diesel Generators	Richmond	5,000,000	2,016	4,997,984	5,000,000	-	0%	Ongoing	Y		
LIWWTP Power Reliability	Richmond	8,202,000	900,683	7,301,317	8,202,000	-	11%	Ongoing	Y		
SSI Sulfide Odour and Corrosion Control	Delta	7,700,000	900,171	6,799,829	7,700,000	-	12%	Ongoing	N		Project delayed due to permitting challenges.
VSA Emergency Backup Power	Vancouver	24,310,000	6,002,041	18,307,959	24,310,000	-	25%	Ongoing	Y		
		138,145,000	**76,133,647**	**62,011,353**	**127,995,000**	**10,150,000**					
Infrastructure Upgrade - WasteTreatment Capital											
Iona Secondary Treatment Upgrade	Richmond	1,904,500,000	11,217,629	1,893,282,371	1,904,500,000	-	1%	Ongoing	Y	(5)	A budget update will be provided in early 2021, following completion of the Indicative Design.
North Shore WWTP Secondary Upgrade and Conveyance	Dist of North Van	881,900,000	249,107,907	632,792,093	881,900,000	-	28%	Ongoing	Y	(5)	A project review is being completed to assess cost, risk and schedule, and further updates will be provided at a later date.
		2,786,400,000	**260,325,536**	**2,526,074,464**	**2,786,400,000**	**-**					
Infrastructure Upgrade Capital											
AIWWTP Ammonia Removal – Sidestream	Delta	125,900,000	733,551	125,166,449	125,900,000	-	1%	Ongoing	Y	(4)	Continuing with data collection with more analyses in 2022 to confirm study results.
AIWWTP DAF Polymer Building Replacement	Regional	550,000	538,009	11,991	550,000	-	98%	Ongoing	Y		
AIWWTP Electrical Distribution System Protection Control and Monitoring	Delta	2,650,000	24,526	2,625,474	2,650,000	-	1%	Ongoing	Y		
AIWWTP Replacement of Protective Relays	Delta	3,258,000	1,955,214	1,302,786	3,258,000	-	60%	Ongoing	Y		
All WWTPs Power Quality Monitoring & Outage Alarming Network	Regional	2,870,000	1,290,728	1,579,272	2,870,000	-	45%	Ongoing	Y		
Biosolids Dryer	Langley City	14,700,000	32,949	14,667,051	14,700,000	-	0%	Ongoing	N		Property purchase delayed.
IIWWTP Biosolids Dewatering Facility	Richmond	61,300,000	18,727,461	42,572,539	61,300,000	-	31%	Ongoing	Y		
IIWWTP Sludge Lagoons Dewatering Facility	Richmond	2,850,000	435	2,849,565	2,850,000	-	0%	Ongoing	Y		
New CSO Management Gates for New Westminster Interceptor	New Westminster	5,925,000	77,511	5,847,489	5,925,000	-	1%	Ongoing	Y		
WWTPs Electrical System Studies & Upgrades	Regional	1,900,000	-	1,900,000	1,900,000	-	0%	Not Started	N	(4)	Awaiting completion of AI Stage 5 Ph1 and AI Cogen projects studies.
		221,903,000	**23,380,384**	**198,522,616**	**221,903,000**	**-**					
Opportunity Capital											
AIWWTP Hydrothermal Processing Pilot	Delta	8,980,000	326,225	8,653,775	19,360,000	(10,380,000)	4%	Ongoing	Y	(6)	Project definition resulted in additional complexity and costs.
Fraser Sewerage Area Integrated Resource Recovery (IRR) Study	Regional	1,200,000	-	1,200,000	1,200,000	-	0%	Ongoing	N		Initiation delayed due to departmental reorganization. Project Manager will be changing.
LIWWTP Biogas Clean-up Project	Richmond	13,800,000	5,555,241	8,244,759	13,800,000	-	40%	Ongoing	Y		
LIWWTP Pilot Digestion Optimization Facility	Richmond	3,100,000	706,227	2,393,773	3,100,000	-	23%	Ongoing	Y		
North Surrey Interceptor - Port Mann Section - Odour Control	Surrey	7,500,000	98,647	7,401,353	7,500,000	-	1%	Ongoing	Y		
		34,580,000	**6,686,340**	**27,893,660**	**44,960,000**	**(10,380,000)**					

Metro Vancouver
Liquid Waste Services Capital Expenditures Summary
As of April 30, 2020

		Lifetime									
Project	**Project Location**	**Total Project Budget**	**Total Expenditures to Date**	**Remaining Budget**	**Projected Expenditures**	**Projected Remaining Budget**	**Percent Complete**	**Status**	**Project on Schedule?**	**Note**	**Comments**

(1) Project will be completed under budget - savings due to competitive pricing.
(2) Full contingency not required.
(3) Funds will be spent if/when opportunity arises.
(4) Project on hold.
(5) Separate status reports are being provided to the Liquid Waste Committee and Board.
(6) Additional budget included in 2021 Capital Plan.
(7) Design work done in house resulting in lower cost.

ATTACHMENT 3

Capital Project Status Information
April 30, 2020

GREATER VANCOUVER SEWERAGE & DRAINAGE DISTRICT (Liquid Waste Services)

Major GVS&DD liquid waste capital projects are generally proceeding on schedule and within budget. The following capital program items and exceptions are highlighted:

Infrastructure Growth Program

- **FSA – Albert Street Trunk Sewer** – The construction contract for Phase 1 of this project involves 700 m of new sewer along Seaforth Drive in Port Moody. It was awarded in June 2019. The project was completed in October 2019. Final paving was delayed until spring 2020 and is also finished. Phase 2 – Spring Street to Vintner Street design is underway. Most of this phase will likely be tunneled to mitigate traffic impacts and geotechnical concerns. Targeting Q4 2020 construction start and Q1 2021 completion.

- **FSA – Burnaby Lake North Interceptor (also known as the Winston Street Sewer)** – Phase 1 of the sewer twinning along Lougheed Highway west of Sperling Street is complete. Phase 2 and 3, with diameters of 1050 mm to 1800 mm, involves 2 km of tunneled sewer and 1.2 km of open cut sewer, and will be located along Winston Street from Sperling to east of Piper Street. The open cut portion of the work was awarded to JJM Construction Ltd. in February 2020 and the construction is now underway. The tunneling portion of the work is aimed to be tendered in Q4 of 2020. Construction is scheduled to be complete in 2022. Phase 4, which continues to Cariboo Street, will be completed at a later date.

- **FSA – North Road Trunk Sewer** – This project will provide additional sewer capacity to the growing area near Lougheed Mall and Burquitlam in the Cities of Burnaby and Coquitlam. The construction contract for Phase 1 of this project involves 800 m of new sewer along North Road from Brunette River to north of the Lougheed Highway. The construction contract was awarded to Clearway Construction Ltd., in June 2019. As of the end of April, the contractor is 80% complete and is projected to be fully completed in June 2020. Following the completion of the open cut sewer works, a second contract to build a pipe bridge spanning the BNSF Railway will be issued subject to resolving property and permitting requirements. Phase 2, which involves extending the sewer north of Lougheed Highway to Clarke Road is scheduled for construction in 2022.

- **FSA – South Surrey Interceptor Twinning Johnston Road Section** – This project involves construction of approximately 2.2 km of 3 m diameter corrosion resistant sewer, to provide additional capacity to service Surrey and Langley. Construction of the twinning started in 2015, and is being completed in 5 separate construction contracts. The first two contracts consisted of 1.1 km of open cut sewer from King George Boulevard to Panorama Drive and are totally complete. The third contract involved 820 m of tunnel and was awarded in April 2018 and was substantially completed in December, 2019, with some minor restoration work currently being completed. The last two contracts, involving 220 m of open cut and a large junction chamber, are

scheduled to be tendered in 2020 and 2021 respectively. Total project completion is anticipated to be reached in 2022.

- **FSA – South Surrey Interceptor – King George Section Odour Control Facility (OCF) and Grit Chamber**. This project involves three separate installations: two odour control facilities (at King George Boulevard near 56 Ave in Surrey and at Highway 10 and Highway 91 in Delta) and a grit chamber at the King George location. The grit chamber portion of this project is complete and in service. Tritech Group Ltd., the contractor for the odour control facilities, has procured the equipment and started construction on both the Highway 91 and the King George facility. Commissioning of the two odour control facilities is scheduled for the summer of 2020, and spring 2021 respectively.

- **FSA – Sapperton Pump Station** – The construction contract was awarded to NAC Constructors in September 2016 and is expected to be substantially complete in 2020. Construction is currently 95% complete, with the pump station building almost finished and landscaping work underway. Final electrical work is nearing completion with BC Hydro energization now complete and pump commissioning activities to follow.

- **FSA – Annacis Island WWTP Stage 5 Expansion Phase 1** – This work involves expansion of treatment process units including primary sedimentation tanks, secondary clarifiers, solid contact tanks and odour control facilities. This construction contract was awarded to Graham and AECON Joint Venture in April 2017. The contract value is $265 million construction of the Phase 1 main contract is 93% completed and the anticipated substantial completion date is September 2021.

- **FSA – Annacis Island WWTP Outfall** – This project involves the construction of a new outfall with increased capacity to support population growth. The 4.2 m diameter outfall will be tunneled at a depth of approximately 40 m, and convey treated effluent approximately 1 km from the Plant to the Fraser River where it will discharge from a 2.5 m diameter, 250 m long diffuser manifold buried in the river bed. The construction contract was awarded in May 2019 to Pomerleau-Bessac General Partnership. The contractor has completed the walls of the two tunnel shafts. In-river construction will start in June 2020. Construction is scheduled to be complete by Spring 2024.

- **FSA – Northwest Langley Treatment Projects** – This work involves expansion of the treatment plant from serving 30,000 people to 230,000 people. It also includes a new river crossing, new pump station, SSO storage tank and outfall. The estimated construction cost is $1.3 billion and is scheduled to be complete by the end of 2026.

  Detailed design of the new treatment plant is currently underway and is 30% complete. Multiple equipment preselection tenders continue to be issued to help inform the design. The pump station and storage tank construction is underway with sheet piling and excavation currently occurring. The river crossing design is progressing well, and a RFQ has been issued to shortlist contractors. The RFP will be issued later this year. Phase 1 ground improvements have been completed and phase 2 ground improvements are 30% complete. The overall project is currently on schedule.

- **VSA – Hastings Trunk Sewer – The Hastings Trunk sewer (also known as the Douglas Trunk Sewer)** will provide additional capacity to support rapid development and population growth in the Brentwood Mall and Gilmour areas in Burnaby. The project involves construction of 1.8 km of sewer ranging from 750 mm to 1200 mm in diameter. The construction of a 1.25 km of tunneled section is completed. The remaining 550 m of open cut works is 80% complete. All work is scheduled for completion in July of 2020.

Infrastructure Maintenance Program

- **LSA – Gilbert Trunk Sewer Twinning** - Construction of the 3.5 km long Phase 1 is complete. The remaining 3 Phases have a total length of 6.5 km consisting of 1.5 m and 1.8 m diameter sewers. Phase 2 construction from Blundell to north of Westminster Highway is 95% complete, with completion projected for summer of 2020. Phase 4, from Steveston Highway to the Lulu Island WWTP, will be tendered in Q3 of 2020. Phase 3, which extends from Blundell Road south to the Steveston Highway will be completed last, with construction scheduled to start in 2021.

- **VSA – Iona Island WWTP Solids Handling Upgrade** – This project involves upgrades to the existing grit removal and sludge screening systems, increasing sludge thickening capacity, and improving the digester sludge mixing systems. Construction to refurbish the existing sludge thickener was completed on schedule in April 2016 and is back in full operation. The construction of the new screening, degritting and thickening facility was completed and in operation since August 2017. The Digester Mixing Upgrade contract started in November 2015 and, of the four digesters, Digesters No. 2, No. 3 and No. 4 upgrades are complete and back in service. Work on the last digester, Digester No. 1, started in July 2019 and is scheduled to be complete by December 2020.

- **FSA – Annacis Island WWTP Secondary Clarifier Corrosion Repair** – This project involves replacing 12 secondary clarifier mechanisms that have been damaged by corrosion and are at the end of their service life. The construction contract for this project includes the Secondary Clarifier Flow Control and Secondary Bypass components which involve the addition of 12 new influent flow balancing gates, and the replacement of 3 existing secondary bypass gates. To date, 7 mechanisms, 3 flow balancing gates and all 3 secondary bypass gates have been replaced. A tender for the remaining 5 mechanism units, and the replacement of the 12 existing effluent launders and weirs, was awarded in March 2019, in the amount of $17M. Fabrication of the new mechanisms is underway. Construction is scheduled to start in May 2020 following completion of the new Stage 5 secondary clarifiers, with construction projected to be complete in 2023.

Infrastructure Resilience Program

- **FSA – Annacis Island WWTP Cogeneration System** – This $75 million resiliency project involves the installation of four new larger capacity cogeneration engines (2000 kW each) complemented by two new emergency stand-by diesel generators (3000 kW each) in order to: 1) provide rapid response (< 60 seconds) emergency back-up power in case of BC Hydro utility outages, 2) optimize the use of digester gas produced at the plant, 3) increase the cogeneration capacity, 4) minimize the amount and cost of electricity imported from BC Hydro costs, and 5) minimize digester gas flaring. Construction started in Q4 2017 and was substantially completed as of August 2019. The new cogeneration engines and diesel gensets are have been partially commissioned and are in service. Operational modifications are being made and final commissioning will take place later in the year after disinfection season.

- **VSA – Highbury Interceptor Air Treatment Facilities –** Construction of this odour control station located in Musqueam Park in Vancouver started in February 2018. The facility construction is 95% complete and scheduled to be in service in July 2020. The air jumper component, which is a separate facility to allow the free movement of air in the sewer and extend odour control south to the Fraser River, was completed in September 2019.

- **VSA – Emergency Backup Power -** This project involves design, supply and installation of standby emergency backup generators at the Chilco, Columbia, Harbour, Hudson, Jervis, Kent and Willingdon pump stations to allow the stations to remain operational during power failure events and reduce the risk of a spill. Three separate tenders for the Columbia, Harbour, Hudson, Kent and Willingdon upgrades were issued in Q4 2019. The equipment has been procured, and construction is underway. These 5 sites are all scheduled to be commissioned in 2020. The Vancouver Parks Board approved the Jervis Genset concept in the fall of 2019, and the design and permitting of the Jervis facility is advancing. Construction is scheduled to start in September 2021. The Chilco facility concept is currently being reviewed with the Vancouver Parks Board, prior to starting the detailed design.

Infrastructure Upgrade Program

- **VSA – Iona Island WWTP Biosolids Dewatering Facility** – This project involves the construction of a mechanical dewatering facility to dewater on-going plant production of biosolids so that they can be transported for beneficial reuse or disposal. This facility will permit the decommissioning of the four existing digested sludge lagoons and the sludge drying area to make space for the construction of the new treatment plant. The $55 million design-build contract was awarded to NAC Constructors in April 2019. The design phase is complete. Ground improvement comprising of 400 stone columns is complete, and foundation works and undergroup utilities are being constructed. The project is scheduled to be complete in April 2021.

39629809

To: Liquid Waste Committee

From: Andjela Knezevic-Stevanovic, Director, Environmental Management & Quality Control, Liquid Waste Services

Date: June 29, 2020 Meeting Date: July 16, 2020

Subject: **2019 GVS&DD Environmental Management & Quality Control Annual Report**

RECOMMENDATION

That the Liquid Waste Committee receive for information the report dated June 29, 2020 titled "2019 GVS&DD Environmental Management & Quality Control Annual Report".

EXECUTIVE SUMMARY

Annual reporting of GVS&DD Environmental Management & Quality Control is a regulatory requirement under the *Integrated Liquid Waste and Resource Management Plan*. This report summarizes the compliance, process control and regional environmental quality information gathered through various monitoring and risk assessment programs. In 2019, Metro Vancouver wastewater treatment plants operated efficiently, in compliance with the applicable regulatory requirements, and with no adverse effects on human health or the environment. Regional liquid waste discharges were effectively managed in a manner that is protective of human health and aquatic life.

PURPOSE

To provide the Liquid Waste Committee with a summary of the 2019 GVS&DD Environmental Management & Quality Control Annual Report.

BACKGROUND

Annual reporting of GVS&DD Environmental Management & Quality Control is a requirement under the Ministerial conditions of approval of Metro Vancouver's *Integrated Liquid Waste and Resource Management Plan* (ILWRMP).

The Executive Summary of the 2019 GVS&DD Environmental Management & Quality Control Annual Report (Attachment) summarizes the regulatory and process control information gathered through the various monitoring and risk assessment programs that are in place to meet GVS&DD's commitments under the ILWRMP, including those for: wastewater treatment plant influent, effluent and process streams; operation of the collection system; effluent toxicity; environmental heath of regional water bodies; and biosolids quality. The 2019 GVS&DD Environmental Management & Quality Control Annual Report will be submitted to the Ministry of Environment and Climate Change Strategy. Additionally, it will be made available to the public through Metro Vancouver's web site and through the Metro Vancouver Library.

SUMMARY OF RESULTS

In order to assess wastewater treatment system efficiency, performance and reliability, and to perform biosolids and environmental quality monitoring, the Environmental Management & Quality Control Division laboratories alone performed over 205,000 analyses in 2019. Major conclusions are as follows:

a) The five wastewater treatment plants (WWTPs) treated about 435 billion litres of wastewater in 2019. The treatment process removed about 65,000 tonnes of biochemical oxygen demand (BOD) and about 66,000 tonnes of total suspended solids (TSS).

b) The WWTPs consistently complied with Wastewater Systems Effluent Regulations and Operational Certificate requirements. Seventeen reports related to treatment process interruptions were submitted to the regulators. The Ministry of Environment and Climate Change Strategy compliance assessment determined that the conditions and requirements of the Operational Certificates were met.

c) About 14,700 tests were performed on biosolids in 2019. Metal concentrations in weekly composite samples and fecal coliform counts in biosolids were generally well below the regulatory limits outlined in the *Organic Matter Recycling Regulation*.

d) Effluent samples from all wastewater treatment plants passed the required monthly acute toxicity test except for five samples from Iona Island and one sample from Lions Gate WWTP. Each of these effluent samples required oxygen in excess of that specified by the Environment and Climate Change Canada method.

e) As part of the characterization of wastewater from all five WWTPs for contaminants of emerging concern, analysis of trace organic and endocrine disrupting substances continued through 2019. Analyzed substances include: organochlorine pesticides (OCPs) and other types of pesticides, polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs), volatile organic compounds, phenolic compounds, surfactants, polybrominated diphenyl ethers (PBDEs), hormones and sterols, pharmaceuticals and personal care products (PPCPs). Results are used to inform decisions regarding the management of these substances through treatment or source control initiatives.

f) Water quality in the vicinity of the Annacis WWTP outfall and in the lower Fraser River met the applicable water quality objectives and guidelines. In 2019, additional sediment monitoring related to the Annacis Island WWTP Stage V Outfall Upgrade Project was conducted. Monitoring stations were located in the vicinity of the future outfall. The work was done to inform design of a post-outfall construction sediment monitoring program.

g) Burrard Inlet environmental monitoring program included locations in the vicinity of the Lions Gate WWTP outfall, as well as the Inner and Outer Harbour. Water quality generally met the applicable water quality objectives. Sediment monitoring results were similar to prior years and indicated some changes. The analysis of findings suggests that both nutrient and contaminant

distributions in Burrard Inlet are confounded by activities and sources other than the Lions Gate WWTP.

h) 2019 marked the fifth year of Metro Vancouver's collaboration with UBC on the Strait of Georgia environmental monitoring program focused on understanding the transport and deposition patterns of substances of interest.

i) Assessment of water quality monitoring results for Boundary Bay indicated that the applicable objectives or guidelines were mostly met.

j) The bacteriological water quality for primary-contact recreation was met at bathing beaches from May through September, except for four beach locations. Swimming advisories were issued by the Health Authorities for Deep Cove, Ambleside, Kitsilano and Sunset Beach for a combined total of 39 days. In comparison, during the previous four-year period, swimming advisories were issued by the Health Authorities for an average of 18 days/year. The causes of elevated bacterial counts are not completely understood, but collaborative microbial source tracking study is showing a promising potential to identify sources of contamination.

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

FINANCIAL IMPLICATIONS
Ongoing environmental management, monitoring and quality control works are proceeding as required under the GVS&DD *Integrated Liquid Waste and Resource Management Plan* and the associated costs are included in the Liquid Waste Services Environmental Management & Quality Control annual operating budget.

CONCLUSION
Annual reporting of GVS&DD Environmental Management & Quality Control is a regulatory requirement under the *Integrated Liquid Waste and Resource Management Plan*. This report summarizes the compliance, process control and regional environmental quality information gathered through various monitoring and risk assessment programs that are in place to meet GVS&DD's commitments under the ILWRMP.

As illustrated by the 2019 GVS&DD Environmental Management & Quality Control Annual Report, Metro Vancouver's wastewater treatment plants continue to meet performance expectations with respect to reduction of contaminant loadings to the receiving environment and are consistently providing ongoing benefits to the region. Various monitoring programs continue to fulfill their role of confirming that the wastewater treatment plants are operating efficiently and with no adverse effects on human health or the environment. Findings of the environmental monitoring programs confirm that regional liquid waste discharges continue to be effectively managed in a manner that is protective of aquatic life.

Attachment
2019 GVS&DD EM&QC Annual Report Executive Summary (39754700)

39752936

EXECUTIVE SUMMARY

INTRODUCTION

Background and Purpose

The Greater Vancouver Sewerage and Drainage District (GVS&DD, or the District) operates five wastewater treatment plants (WWTPs) in the region. Three of the five plants provide secondary treatment (Annacis Island, Lulu Island and Northwest Langley) and discharge treated effluent into the lower Fraser River. The other two WWTPs (Iona Island and Lions Gate) provide primary treatment and discharge treated effluent to Georgia Strait and First Narrows of Burrard Inlet, respectively.

The purpose of this report is to document the performance of the collection system and WWTPs in 2019 and to summarize the findings of numerous environmental management initiatives.

This report provides an overview of the information collected as a result of Environmental Management & Quality Control's environmental monitoring, modeling and assessment programs for the WWTPs, including monitoring for influent, effluent and biosolids quality, and environmental health of regional water bodies. Other programs and projects discussed in this report are in support of ongoing commitments under the *Integrated Liquid Waste and Resource Management Plan* (ILWRMP, or the Plan) or compliance with federal or provincial regulatory requirements.

Overview of the Liquid Waste Management Regulatory Framework and Monitoring Process

Under the provisions of the Environmental Management Act, the BC Minister of Environment and Climate Change Strategy approved Metro Vancouver's ILWRMP in May 2011. The Plan has three goals: protect public health and the environment; use liquid waste as a resource; and effective, affordable and collaborative management. Metro Vancouver manages its liquid waste in accordance with the ILWRMP and WWTP-specific Operational Certificates (OCs). These Certificates outline wastewater treatment and performance criteria and authorize the GVS&DD to discharge treated effluent from its WWTPs to the receiving waters. Treatment residuals are managed in accordance with Organic Matter Recycling Regulations.

The federal Wastewater Systems Effluent Regulations (WSER) under the Fisheries Act came into effect on July 18, 2012. The WSER contains provisions that authorize the deposit of treated wastewater into Canadian waters. GVS&DD is required to comply with WSER and monitor and report effluent quality on a quarterly basis.

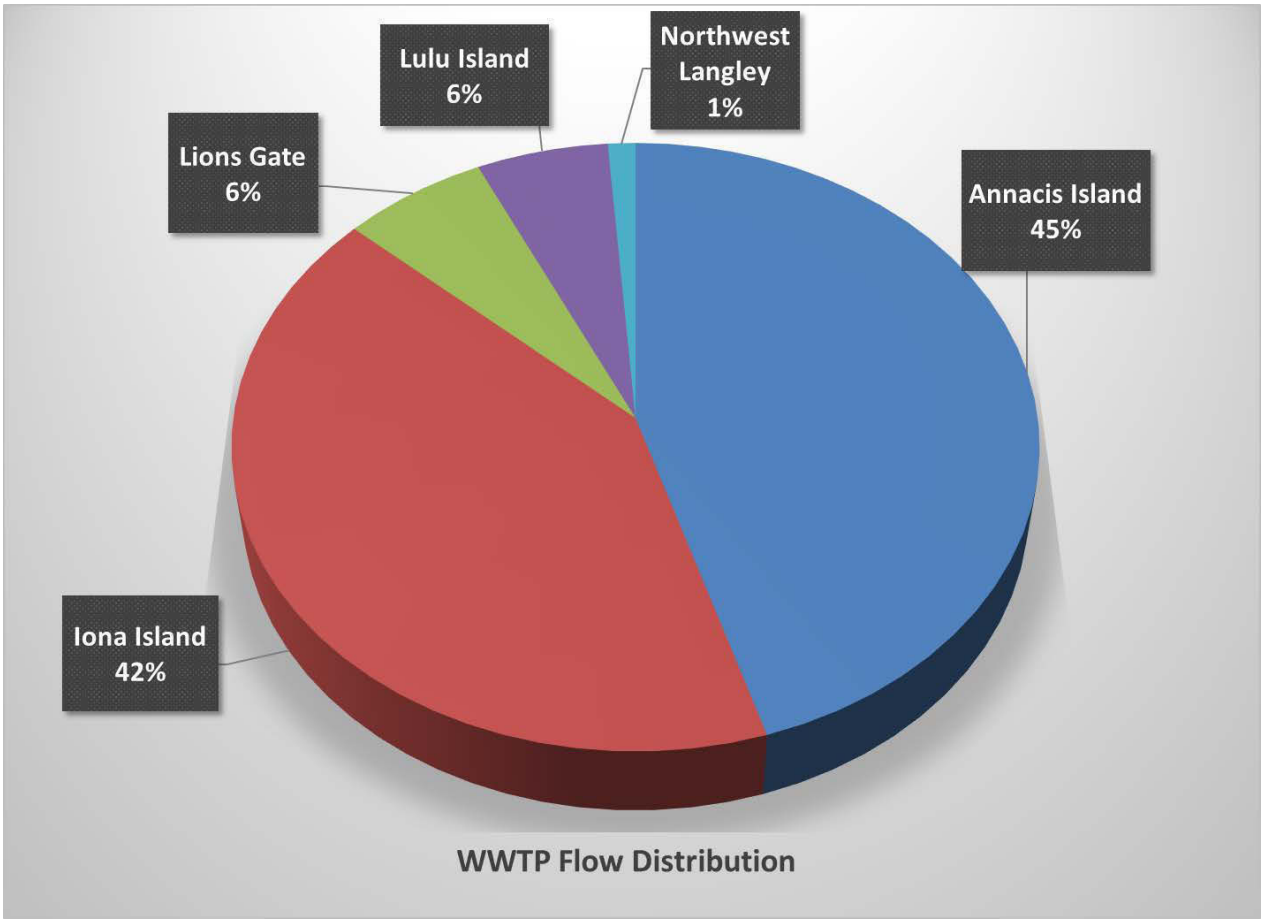
The District's objective is to maintain ongoing compliance with OCs, WSER and other applicable regulatory requirements, and by doing so continue to protect human health and the environment.

Most of the monitoring, laboratory analytical services and data analyses upon which WWTP performance is assessed were provided by the Environmental Management & Quality Control Division of Metro Vancouver Liquid Waste Services.

WASTEWATER TREATMENT PLANTS PERFORMANCE

In 2019, about 435 billion litres of wastewater was treated at the GVS&DD's five WWTPs. Of this total, 208 billion litres received primary treatment at Iona Island and Lions Gate WWTPs, with the remaining 227 billion litres treated at the three secondary WWTPs at Annacis Island, Lulu Island and Northwest Langley, as shown in the graph below.

Distribution of Wastewater Treated in Metro Vancouver in 2019



Treatment Plant Performance Review

Metro Vancouver treatment plant performance is assessed annually to ensure:

- Plant operation is in accordance with design objectives and specifications; and
- All applicable regulatory requirements are met.

During 2019, the overall performance of the District's five WWTPs exceeded design performance expectations. The following table summarizes the average reduction in Biochemical Oxygen Demand (BOD) (or Carbonaceous Biochemical Oxygen Demand (cBOD), where applicable) and Total Suspended Solids (TSS) loadings for all plants.

Average reduction in BOD and TSS loadings fot each WWTP in 2019

Wastewater Treatment Plant	% BOD Reduction	% TSS Reduction
Iona Island *	49	65
Lions Gate*	48	71
Annacis Island **	93	94
Lulu Island **	98	98
Northwest Langley**	95	93

* Reduction for primary plants is expected to be about 30% for BOD and 60% for TSS
** Reduction for secondary plants is expected to be about 90% for both TSS and cBOD

Wastewater Treatment Plant Operational Certificates

The OCs issued by the Ministry of Environment and Climate Change Strategy (MOECCS) under the provisions of the Environmental Management Act include daily compliance levels for flow and daily loadings for BOD (or cBOD) and TSS. The loading parameters listed as "maximum daily discharge loadings" are used to calculate the annual discharge authorization fees as required by the Permit Fees Regulation and are based on a calendar year.

Among other OC conditions, requirements are listed for disinfection of the effluent at all WWTPs except Iona Island, so that fecal coliform water quality objectives for the receiving water body are met at the edge of the Initial Dilution Zone (IDZ) as defined by the Municipal Wastewater Regulation. When chlorine is used for disinfection, it must be removed from the effluent before discharge to the receiving waters.

The OC requirements for BOD and TSS were generally met throughout 2019. OCs require Metro Vancouver to report all treatment process interruptions to the MOECCS. In 2019, GVS&DD submitted 17 reports to the regulators, which is fairly similar to the number of reports submitted in previous five years. Reported events can be generally grouped into 2 categories: Category 1 includes instances of disinfection or dechlorination system interruptions, plant bypasses and other unauthorized discharges. Category 2 events were the results of daily discharge loadings for TSS or cBOD above the maximum load limits as well as a daily rate of effluent discharge above the maximum limits. These events typically have no significant environmental impact.

Each event is carefully reviewed and a probable cause, mitigation measures and potential environmental effects are assessed based on dilution dispersion modeling of effluent plume transport and predicted downstream concentrations, or on field observations.

In October 2019, power interruptions at Lulu Island and Annacis Island WWTPs affected regular operation of dechlorination and disinfection operations, respectively. These events may have resulted in exceedance of the applicable water quality guidelines for chlorine or Health Canada Recreational Water Quality Guidelines in the Fraser River. The MOECCS performed compliance assessments and determined that the conditions and requirements under the Emergency Procedures

clauses of the respective plants' OCs were met. The plants were deemed to be in compliance with their OCs in both instances.

Integrated Liquid Waste and Resource Management Plan (ILWRMP)

The ILWRMP commits GVS&DD to operate the secondary WWTPs to meet the National Performance Standards for effluent specified by the Canada-wide Strategy for the Management of Municipal Wastewater Effluent (CWS-MMWE). The concentrations of cBOD and TSS at all secondary WWTPs stayed below the maximum average of ≤ 25 mg/L as specified by the National Performance Standards. Averaging periods for Annacis island and Lulu Island WWTP are monthly, and for Northwest Langley WWTP, quarterly.

Wastewater Systems Effluent Regulations (WSER)

Quarterly monitoring reports were submitted through Environment and Climate Change Canada's (ECCC's) Effluent Regulatory Reporting Information System (ERRIS) in 2019. As required by WSER, the effluent monitoring data reported were: number of days that effluent was deposited; total volume of effluent deposited in m^3; average effluent cBOD in mg/L; and the average effluent concentration of suspended solids in mg/L. In addition, reporting of effluent acute lethality for secondary treatment plants is required on a quarterly basis for Annacis Island and Lulu Island WWTPs and on an annual basis for the Northwest Langley WWTP.

In 2019, all District's secondary WWTPs met the applicable WSER requirements for all regulated parameters: TSS, cBOD, un-ionized ammonia, total residual chlorine and acute lethality of effluent.

GVS&DD's primary treatment plants (Iona Island and Lions Gate WWTPs) were issued transitional authorizations under WSER on September 5, 2014. In 2019, all District's primary WWTPs met the applicable WSER requirements for all regulated parameters: TSS, cBOD and un-ionized ammonia.

Effluent Toxicity Monitoring

In 2019, all effluent samples from all WWTPs passed the OC required Rainbow Trout acute lethality test using ECCC test protocols except for five samples of Iona Island WWTP and one sample of Lions Gate WWTP effluent. Each of these effluent samples required oxygen in excess of that specified by the ECCC method.

In addition, acute toxicity testing of *Daphnia magna* was conducted monthly (or quarterly for Northwest Langley WWTP) as recommended by the CWS-MMWE. All samples from the secondary WWTPs passed the *Daphnia magna* acute toxicity test. For the primary WWTPs, nine Iona Island and eleven Lions Gate WWTP samples passed the *Daphnia magna* test, and the remaining samples passed when the test was repeated within allowable holding times.

Periodically, some chronic toxicity of effluent, as well as some background toxicity in the Fraser River upstream from the influence of Metro Vancouver's WWTP discharges was observed. Additional testing and investigation to determine if there is a pattern to the observed variability, and subsequently to identify potential sources of apparent chronic toxicity has been conducted. A tiered

toxicity identification evaluation (TIE) for chronic toxicity was initiated in 2018 and continued through 2019 with the objective to identify the causes of the observed toxicity.

Biosolids Monitoring Program

Process Requirements and Biosolids Management

The Organic Matter Recycling Regulation (OMRR) governs the management of biosolids and compost as soil amendments in the Province of British Columbia. Under this regulation, sampling frequencies and criteria values for fecal coliforms and metals as specified for Class A and Class B biosolids are based on several parameters including: type of treatment process (pathogen reduction requirements, vector attraction reduction); the amount of dry solids produced on a monthly basis; and the intended use of the biosolids. The GVS&DD's biosolids management program ensures that any biosolids not meeting class specifications are identified, tracked and managed appropriately.

Biosolids Quality

About 14,700 tests were performed on biosolids in 2019. Metal and fecal coliform counts in biosolids were generally well within the Class A criteria for Annacis Island WWTP, and within Class B criteria for Lions Gate and Lulu Island WWTPs. Iona Island WWTP land-dried biosolids met the Class B criteria. Thickened waste secondary sludge from Northwest Langley WWTP is trucked to Annacis Island WWTP for digestion.

ENVIRONMENTAL MANAGEMENT PROGRAMS

Environmental management programs form a major part of the Metro Vancouver's integrated approach to managing liquid waste. The purpose of these programs is to characterize environmental conditions of relevant water bodies in the region in order to understand the relative contribution and significance of discharges from the regional and municipal systems, determine if the applicable regulatory requirements are being met, and to warn of possible environmental issues. Environmental management programs include environmental monitoring, human health and ecological risk assessments, environmental simulation and forecasting.

Overflow Quality Monitoring and Environmental Risk Assessments

Municipal wastewater in the region is conveyed and treated in one of the District's WWTPs. However, discharges of untreated wastewater into regional water bodies are sometimes unavoidable mostly due to insufficient system capacity during wet weather, power outages, and the legacy of combined sewer systems.

Combined Sewer Overflows

In 2019, the Combined Sewer Overflow (CSO) Monitoring Program characterized the overflow water quality for seven selected CSO locations: Angus Drive, Cassiar, Clark Drive, English Bay, Glenbrook, Heather, and Macdonald. In addition, a receiving environment monitoring program report was completed for Clark Drive CSO and field work was completed for the Borden CSO receiving environment monitoring program.

Sanitary Sewer Overflows

Metro Vancouver continued monitoring the receiving environment water quality after each sanitary sewer overflow and provided results to regulatory agencies and municipalities.

Environmental Monitoring in the Regional Waterbodies

Metro Vancouver monitors environmental health of the regional water bodies:

- near WWTP outfalls in the receiving environment, at the IDZ boundary, and
- in major water bodies within the ambient environment further away from WWTPs and other point source discharges to assess background conditions.

In previous annual reports, Metro Vancouver reported separately on WWTP receiving environment monitoring (REM) and ambient environment monitoring (AEM) programs. Metro Vancouver has modified its programs to a more holistic water body approach and in 2019 continued with pilot studies which amalgamated receiving and ambient environment monitoring programs for Burrard Inlet water and sediment quality, and for Fraser River fish health. Additional environmental monitoring work in support of WWTP upgrades for Annacis Island and Northwest Langley was also conducted. A summary of the monitoring program findings for the regional water bodies is provided below.

Strait of Georgia

The 2019 Iona Island WWTP Deep Sea Outfall monitoring program included sediment monitoring, demersal fish survey and an effluent plume delineation study. Work continued on a multi-year collaboration with UBC to better understand the transport and deposition of substances of interest in the Strait of Georgia. The assessment of the 2018 monitoring results completed in 2019 indicate that the applicable objectives or guidelines were met, except for dissolved oxygen and boron, for which results were consistent with typical concentrations in Canadian coastal marine waters.

Burrard Inlet

The 2018 and 2019 water and sediment quality monitoring portions of the Burrard Inlet environmental monitoring program were an amalgamation of the previous Lions Gate WWTP REM program and the Burrard Inlet AEM program into common water and sediment programs within Burrard Inlet. The assessment of 2018 monitoring results completed in 2019 indicated that site specific water quality objectives at the boundary of the IDZ for the Lions Gate WWTP were met with the exception of dissolved oxygen and boron, which also were not met elsewhere in Burrard Inlet.

The lower dissolved oxygen concentrations may be related to regional changes, while boron concentrations are consistent with those in Canadian coastal waters. Sediment monitoring results were similar to prior years and indicated some changes. However, there was no correlation between wastewater quality indicators and biota results, suggesting that both nutrient and contaminant distributions in Burrard Inlet are confounded by activities and sources other than the Lions Gate WWTP. Therefore, the observed changes were likely influenced by factors other than the Lions Gate WWTP.

Fish community and health monitoring in Burrard Inlet is conducted about every five years and was most recently conducted in 2017. The report was completed in 2019. Overall whole-body English sole samples from southern Indian Arm and Port Moody Arm had concentrations for some chlorinated

trace organics above their corresponding thresholds for the protection of aquatic life. Tissue concentrations for muscle fillet samples met their respective guidelines for human consumption.

Fraser River

In 2019, water quality was monitored at the Annacis Island WWTP IDZ boundary, and the Fraser River ambient water quality monitoring was completed. All measured parameters at all ambient monitoring sites met the applicable objectives or guidelines.

Assessment of the 2018 monitoring results for Annacis Island WWTP IDZ completed in 2019 indicated that all measured parameters met the applicable objectives and guidelines, except un-ionized ammonia, which on occasion did not meet the Canadian Council of Ministers of the Environment (CCME) guideline. However, total ammonia concentrations met the site-specific Fraser River Water Quality Objective.

In 2019, a report on sediment monitoring related to the Annacis Island WWTP Stage V Outfall Upgrade Project was completed. Monitoring stations were located in the Fraser River in the vicinity of the proposed outfall. The work was done to inform design of a post-outfall construction sediment monitoring program.

Boundary Bay

In 2019, work was conducted to further analyze and interpret the previously generated biota results. Assessment of water quality monitoring results indicated that the applicable objectives or guidelines were mostly met. Exceptions were dissolved oxygen and boron, for which results were consistent with typical concentrations in Canadian coastal marine waters.

Recreational Water Quality Monitoring Program

Metro Vancouver monitored the bacteriological quality of recreational waters in the region at 114 sampling sites from 41 locations. In 2019, the bacteriological water quality for primary-contact recreation was met for most bathing beaches from May through September, except at four beach locations. Swimming advisories were issued by the Health Authorities as a result of observed *E. coli* concentrations exceeding the single sample maximum water quality guideline at Deep Cove (2 days), Ambleside Beach (6 days), Kitsilano Beach (6 days), and Sunset Beach (25 days). The 30-day geometric mean guideline was also exceeded at Sunset Beach for 6 days during its 25-day advisory period.

To: Liquid Waste Committee

From: Tom Sadleir, Program Manager, Community Engagement, Liquid Waste Services

Date: June 25, 2020 Meeting Date: July 16, 2020

Subject: **Metro Vancouver's Sewer Overflow Map**

RECOMMENDATION

That the Liquid Waste Committee receive for information the report dated June 25, 2020, titled "Metro Vancouver's Sewer Overflow Map".

EXECUTIVE SUMMARY

Following direction from the Minister of Environment and Climate Change Strategy, Metro Vancouver is developing a real-time sewer overflow map to inform the public of sewer overflows and wastewater treatment plant (WWTP) process interruptions. The map is being developed in phases: Phase 1: sanitary sewer overflows and WWTP process interruptions; Phase 2: combined sewer overflows (CSOs). A Phase 1 pilot map showing real-time sanitary sewer overflows and WWTP process interruptions has been developed for engagement with potentially impacted water users. Supporting communication materials will be prepared including a video and fact sheets. The public launch of the Phase 1 map on Metro Vancouver's website is planned for October 2020. Interested parties will be able to sign-up for email notification of events. An approach to the public notification of CSOs (Phase 2) will be developed with staff from member municipalities, regional health authorities and MOECCS at a later date.

PURPOSE

To update the Liquid Waste Committee on the development of the public notification program for sewer overflows and wastewater treatment plant process interruptions.

BACKGROUND

On September 11, 2019, the BC Minister of Environment and Climate Change Strategy wrote to MVRD Board Chair and Directors regarding Metro Vancouver's request to extend the review cycle timeline for the GVS&DD *Integrated Liquid Waste and Resource Management Plan* by two years. In granting the extension, the Minister imposed seven conditions, one of which was that Metro Vancouver "develop a system to notify the public, in real time, of sewer overflows and wastewater treatment interruptions" by October 30, 2020.

In November 2019, the GVS&DD Board approved the scope of the public notification program for sewer overflows and WWTP process interruptions and authorized staff to proceed with the engagement process, as outlined in the report dated November 8, 2019, titled "Public Notification of Sewer Overflows and Wastewater Treatment Plant Process Interruptions".

This report provides an update on the development of the notification program, which includes a publicly accessible real-time map of sewer overflows and WWTP process interruptions and related engagement and communication activities.

PUBLICLY ACCESSIBLE REAL-TIME SEWER OVERFLOW AND WWTP PROCESS INTERRUPTION MAP

Metro Vancouver is developing a real-time map to inform the public of sewer overflows and WWTP process interruptions. The map is being developed in two phases:

- Phase 1: sanitary sewer overflows (SSOs) and WWTP process interruptions
- Phase 2: combined sewer overflows (CSOs)

Phase 1

A pilot map has been developed to notify the public when untreated or partially treated wastewater is discharged to the environment as a result of SSOs and WWTP process interruptions. Based on data Metro Vancouver has collected around the impact of these overflows and interruptions on their receiving environments, waterways may exceed Health Canada's prescribed guidelines for irrigation and recreation for a period of up to 48 hours following an overflow event. The map identifies where events are occurring in real-time or have occurred in the past 48 hours. Interested parties will be able to sign up to receive notification of events. The public launch of the map on Metro Vancouver's website is planned for October 2020 following engagement to introduce the initiative and to receive and consider feedback.

Phase 2

Metro Vancouver will develop an approach to the public notification of CSOs in collaboration with staff from member municipalities, regional health authorities and the Ministry of Environment and Climate Change Strategy.

Engagement and Communication Process

The objectives of the engagement and communication process supporting the real-time sewer overflow and WWTP process interruption map are to:

- Inform the public about the map and invite them to sign up to receive automatic email notification of overflows and WWTP process interruptions
- Create awareness about liquid waste management in the region, sewer overflows and WWTP process interruptions, and why they happen
- Provide information about Metro Vancouver's ongoing work to prevent overflows and WWTP process interruptions
- Work with member jurisdictions and First Nations to address concerns from their communities related to sewer overflows and WWTP process interruptions

In early August 2020, Metro Vancouver will engage water users potentially impacted by SSOs and WWTP process interruptions to introduce the initiative, gather feedback on the pilot map and invite them to sign up for email notifications. Invitations to trial the map and provide feedback will go to approximately 200 potentially impacted water users identified through extensive modelling work, representing commercial, industrial and agricultural water users, First Nations and parks with water access.

Communication materials being prepared to accompany the map launch include:

- a video explaining sewer overflows
- web content
- background materials to assist member jurisdictions and First Nations in addressing questions and concerns from their communities and the media

Metro Vancouver has informed technical and communications staff from member jurisdictions and First Nations about the notification program and offered opportunities to learn more about the initiative. Earlier this year, staff introduced the initiative to Metro Vancouver's Environmental Monitoring Committee and Stormwater Interagency Liaison Group.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The development of the Phase 1 map, including engagement and communication activities, will cost approximately $50,000 and is covered by the 2020 Liquid Waste Services operating budget. The dedicated staff resources needed to expand the public notification program in the longer term, if necessary, will be identified and confirmed through the 2021 budget planning process.

CONCLUSION

Phase 1 of Metro Vancouver's real-time sewer overflow map will inform the public when untreated or partially treated wastewater is discharged to the environment as a result of SSOs and WWTP process interruptions. Metro Vancouver will engage potentially impacted water users to introduce the initiative and gather feedback on a pilot map prior to the public launch of the map on Metro Vancouver's website, which is planned for October 2020. Metro Vancouver will develop an approach to the public notification of CSOs (Phase 2) with staff from member municipalities, regional health authorities and the Ministry of Environment and Climate Change Strategy.

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Zero Waste Committee

From: Paul Henderson, General Manager, Solid Waste Services
Dean Rear, Chief Financial Officer/General Manager, Financial Services

Date: July 9, 2020 Meeting Date: July 17, 2020

Subject: **Board Budget Workshop – Overview and Next Steps for Solid Waste Services**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated July 9, 2020, titled "Board Budget Workshop – Overview and Next Steps for Solid Waste Services".

EXECUTIVE SUMMARY

On June 5, 2020 a Board Budget Workshop was held with the objective to seek direction for the preparation of the 2021-2025 Financial Plan. The Board provided direction to staff to bring back adjustments to the Five Year Financial Plan that places increased emphasis on financial sustainability, provides short-term relief for households, maintains work on current goals and objectives and allows the organization to realize new opportunities in terms of partnering on projects to meet Board objectives.

In response to this direction, staff will prepare budgets with options and alternatives to respond to the direction and address the concerns raised by the Board. A short-term action plan is being developed with detailed scrutiny being applied to all Solid Waste budgets and financial practices to minimize tipping fee increases while ensuring efforts to reduce waste are not impacted.

PURPOSE

The purpose of this report is to provide the Zero Waste Committee with an overview of the Board Budget Workshop held June 5, 2020, including the Board direction to staff, and the next steps and considerations for the solid waste function.

BACKGROUND

On June 5, 2020 a Board Budget Workshop was held with the objective to seek direction for the preparation of the 2021-2025 Financial Plan. The workshop outlined the principles that guide the work of Metro Vancouver as an organization, the current 2020-2024 Financial Plan, the implications of the COVID-19 pandemic, the tools that can be used to make budget adjustments and a proposed approach for the 2021-2025 Financial Plan.

Based on the input received from the Board, staff are putting together options for the 2021 Budget and Five Year Financial Plan. This report provides an overview of the workshop and discusses next steps and specific considerations for the solid waste function.

BOARD BUDGET WORKSHOP - OVERVIEW

The Board Budget Workshop presentation (see Reference) outlined the principles that guide Metro Vancouver's long-term work, the current Five Year Outlook, the implications of COVID-19 and the tools available to make budget adjustments going forward.

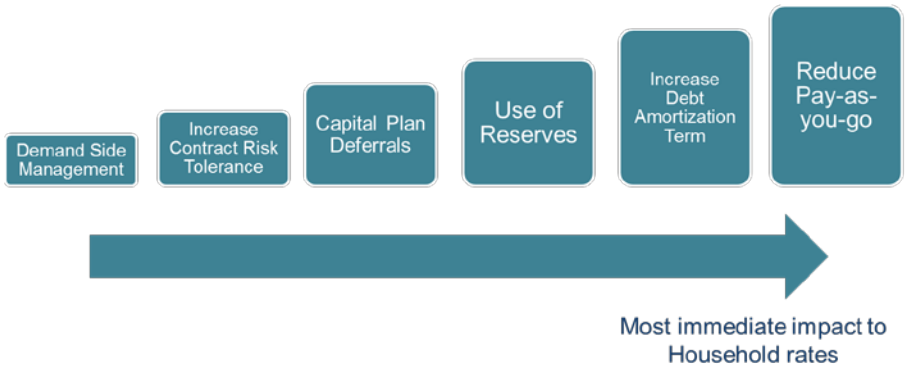
Current Five Year Outlook

The following key points were covered for the current Five Year Outlook:

- Increases to costs of operations, such as that for Water or Liquid Waste Treatment Plants, are generally consistent with inflation
- Capital Funding, through Contributions to Capital from the operating budget and debt service for the capital program consistently drives the increase in the operating budget and the household impact
- Due to the long timeframe associated with the capital program, a significant portion of the capital spend over the next five years is already committed to projects underway (80% in 2021 to 66% in 2024)
- The household impact is set to increase by 6.7% - 8.9%
- Utility rates are generally consistent with similar jurisdictions in Canada and the US

Toolbox

Several tools were presented that would allow for reductions in household rates, but would require tradeoffs in terms of impacting the financial strength of the organization or increasing the risk to the organization. As shown in the diagram below, changes to how the organization approaches funding capital projects would have the most immediate effect on household impact. However, careful consideration will need to be given as to the long-term implications of such changes on future household impacts.



Proposed Approach

Staff proposed leveraging the supported tools to create a short-term action plan that would lessen the upward pressure on household impact for 1-3 years. A short-term action plan would enable strategic goals and objectives to be maintained. If larger or more long-term adjustments are desired, a re-evaluation of long-term plans such as the solid waste management plan, *Climate 2050*, or the *Liquid Waste Management Plan* would be required.

Since an annual budget is approved, this approach will allow for adjustments to be made each year as conditions change based on market changes and other factors. The use of the tools will aim to avoid making severe changes that cannot be easily corrected in the short-term.

WORKSHOP DISCUSSION

Discussion at the workshop gave Board members the opportunity to raise concerns regarding the current Five Year Financial Plan and provide input on adjustments to be made going forward.

Key themes discussed include:

- The increasing household impact and member's ability to pay
- The importance of financial sustainability
- The "growth pays for growth" principle
- Assumptions built into capital projects, including the right sizing of projects and the amount of risk taken on by the organization
- Long-term impacts of changes to amortization of debt
- Maintaining momentum on climate action initiatives

Overall, the short-term action plan approach was supported. As requested by the Board, staff will be bringing back a set of options to address the concerns raised, including the implications of the different options.

NEXT STEPS

Staff are working on the creation of a short-term action plan that would allow the continuation of work on current goals and objectives, but would lessen the upward pressure on household impact for regional ratepayers.

Staff are exploring all viable avenues for budget adjustments, with consideration given to the following:

- Actions that can provide immediate relief while maintaining the work on the long-term vision of the Board
- Risk implications for project delays or deferrals
- The impact of changes to debt amortization on future ratepayers
- The ability of the organization to take advantage of potential stimulus funding

Solid Waste Considerations

The Metro Vancouver Solid Waste function is funded primarily by tipping fees, and thus tipping fees are the primary metric for determining household impact of the solid waste system. Detailed scrutiny of expenditures and revenues is critical in ensuring upward pressure on tipping fees is minimized. A key current driver of expenditures is debt costs related to the replacement Coquitlam Transfer Station and new Surrey Recycling and Waste Drop-Off, projects now well underway. In reviewing options for cost savings, expenditure reduction opportunities will need to considered in parallel with ongoing efforts to increase waste diversion rates of materials that can be reused, repurposed or recycled.

Over the summer, Solid Waste staff will be concentrating on budget review and program efficiencies. This will include:

- Examining opportunities to reduce program expenditures
- Reviewing operating contracts to find opportunities to reduce costs
- Looking for opportunities to defer and if possible reduce capital expenditures
- Reviewing past spending patterns to ensure future budgets are reflective of current trends

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

At this time, staff are evaluating the financial implications of budget adjustments to be made for Solid Waste Services in response to the direction received from the Board. Staff will be reporting back on options for the 2021 Budget and Five Year Financial Plan this fall.

CONCLUSION

On June 5, 2020 a Board Budget Workshop was held with the objective to seek direction for the preparation of the 2021-2025 Financial Plan. The Board expressed concerns regarding the increasing household impact and residents' ability to pay, assumptions built into capital projects, and being able to maintain work on the objectives of the Board. In response to the direction received, staff will be creating a set of options to address the concerns of the Board. Staff are aiming to create a short-term action plan that would reduce the household impact for regional ratepayers. Options and alternatives will aim to balance relief for households with the financial health and overall risk to the organization.

References: Board Budget Workshop Presentation – June 5, 2020

39664850

To: Zero Waste Committee

From: Lynne Vidler, Senior Project Engineer, Solid Waste Operations, Solid Waste Services

Date: July 10, 2020 Meeting Date: July 17, 2020

Subject: **Solid Waste Services Capital Program Expenditure Update as of April 30, 2020**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated July 10, 2020, titled "Solid Waste Services Capital Program Expenditure Update as of April 30, 2020".

EXECUTIVE SUMMARY

The capital expenditure reporting process as approved by the Board provides for regular status reports on capital expenditures three times per year. This is the first report for 2020 which includes the overall capital program for Solid Waste Services with a multi-year view of capital projects and the actual capital spending for the 2020 fiscal year to April 30, 2020 compared to the prorated annual budget. To date in 2020, the annual capital expenditures for Solid Waste Services are $7.1 million compared to a prorated Capital Budget of $29.5 million.

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

PURPOSE

The purpose of this report is to provide the Zero Waste Committee with an update on the status of the Solid Waste Services capital program and financial performance for the 2020 fiscal year to April 30, 2020.

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 2020 and looks at the overall capital program for Solid Waste Services with a multi-year view of capital projects and the actual capital spending for the 2020 fiscal year to April 30, 2020 compared to the prorated annual budget.

2020 CAPITAL EXPENDITURES

Capital Program Funding

The capital spending for Solid Waste Services is funded through the Solid Waste Services Operating Budget by a combination of contribution to capital (pay-as-you-go funding) and debt service costs, (principal and interest payments) which is generated annually from the regional ratepayers through tipping fees. As a result, the annual impact on the ratepayers is less than the level of budgeted capital expenditures.

OVERALL CAPITAL PROGRAM

The overall capital program for Solid Waste 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 Solid Waste Services capital projects completed in 2020 or active in 2020 will be under budget by approximately $0.7 million, which is within 0.2% of total budget.

Table 1 in Attachment 1 provides a summary of Solid Waste Services capital expenditures for both ongoing and completed projects for the approved 5-year Capital Budget. 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 predominantly due to savings on budgeted contingency amounts. The majority of projects that have not yet started in 2020 are not scheduled to begin until 2021 or later.

Attachment 2 provides the details behind the summary information including specific capital projects, summary financial information and notes where required. Attachment 3 provides additional status information for some key projects.

2020 CAPITAL PROGRAM PROGRESS

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 includes the projected spending for a list of capital projects either continuing or to be started within the calendar year.

In 2020, capital expenditures for Solid Waste Services were $7.1 million to April 30, 2020 compared to a prorated annual Capital Budget of $29.5 million, representing an overall expenditure rate of 23.9%. The underspend is primarily due to timing of expenditures for the Coquitlam Transfer Station replacement and the Surrey Recycling and Waste Drop-Off projects. Construction is in progress for the Coquitlam Transfer Station replacement and completion is expected in Spring 2021. The construction contract has now been signed for the Surrey Recycling and Waste Drop-Off with construction expected to be completed by late 2021.

Table 2 in Attachment 1 provides a summary of the 2020 actual capital spending compared to the Board-approved Capital Budget.

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 solid waste capital program has largely been schedule related, with few notable impacts to project expenditures confirmed to date. Staff are monitoring impacts on their projects regularly. Any impacts to project schedules or expenditures are included 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 financing. As capital expenditures are incurred, short-term financing is secured and converted twice per year to long-term debt through the Municipal Finance Authority. If capital expenditures are less than budgeted at the end of the year, any surplus, per policy, will be used in future years to fund capital and avoid debt.

CONCLUSION
This is the first in a series of three capital expenditure progress reports for 2020. Solid Waste Services is projecting to be under budget for capital projects ongoing or completed in 2020.

Although the 2020 Solid Waste Services Capital Budget shows a projected underspend, the variance is a result of cash flow timing. Ongoing capital projects are monitored to ensure they remain within total project budgets. Any surplus resulting from a 2020 underspend is used to directly fund capital in 2021 and avoid future borrowing

Attachments *(Orbit # 39644528)*
1. Capital Expenditure Summary – Solid Waste Services
2. Detailed Solid Waste Services Capital Expenditure Summary
3. Solid Waste Services Capital Project Status Information

39643711

Metro Vancouver

Capital Expenditure Summary
Solid Waste Services
As at April 30, 2020

Table 1 – Ongoing and Completed Project Summary

	Total Projected to Completion	Total Budget	Projected Variance
Solid Waste Services			
Ongoing	$ 242,068,000	$ 242,800,000	$ 732,000
Completed	-	-	-
Not Started	105,350,000	105,350,000	-
	$ 347,148,000	**$ 348,150,000**	**$ 732,000**

Table 2 – April 2020 Capital Spending Summary

	2020 Budget	Prorated Budget to April 2020	Actual Expenditures	
Solid Waste Services				
Infrastructure Opportunity Program	$ 2,250,000	$ 750,000	$ 22,719	
Landfills	12,250,000	4,082,000	1,129,032	
Transfer Station System	57,800,000	19,267,000	5,765,037	
Waste to Energy Facility	16,220,000	5,406,000	140,795	
	$ 88,520,000	**$ 29,505,000**	**$ 7,057,583**	**23.9%**

Metro Vancouver
Solid Waste Services Capital Expenditures Summary
As of April 30, 2020

Project Name	Project Location	Lifetime Total Project Budget	Lifetime Total Expenditures to Date	Lifetime Remaining Budget	Lifetime Projected Expenditures	Lifetime Projected Remaining Budget	Percent Complete	Status	Project on Schedule?	Note	Comments
Infrastructure Opportunity Program											
WTE Facility District Heating Opportunities	Burnaby	2,300,000	22,719	2,277,281	2,300,000	-	1%	Ongoing	Y		
		2,300,000	**22,719**	**2,277,281**	**2,300,000**	**-**					
Landfills											
Alternative Fuel and Recyclables Recovery Centre	Coquitlam	60,000,000	-	60,000,000	60,000,000	-	0%	Not Started	Y		
Coquitlam Landfill Closure	Coquitlam	5,000,000	2,320,951	2,679,049	5,000,000	-	46%	Ongoing	Y		
Coquitlam Landfill East Closure	Coquitlam	5,000,000	-	5,000,000	5,000,000	-	0%	Not Started	Y		
Coquitlam Landfill Fly Ash Cell 2 Closure Final Cover	Coquitlam	3,200,000	1,462,221	1,737,779	3,200,000	-	46%	Ongoing	Y		
Coquitlam Landfill Gas Collection Upgrades	Coquitlam	3,100,000	2,856,423	243,577	3,100,000	-	92%	Ongoing	Y		
Coquitlam Landfill Gas Collection Upgrades Phase II	Coquitlam	3,600,000	1,416,526	2,183,474	3,600,000	-	39%	Ongoing	Y		
Coquitlam Landfill Lot 3 Development	Coquitlam	5,000,000	-	5,000,000	5,000,000	-	0%	Ongoing	Y		
Coquitlam Landfill Pump Station Upgrade	Coquitlam	600,000	24,082	575,918	600,000	-	4%	Ongoing	Y		
Coquitlam Landfill: Leachate Collection System Grade Realigi	Coquitlam	1,000,000	-	1,000,000	1,000,000	-	0%	Not Started	Y		
		86,500,000	**8,080,203**	**78,419,797**	**86,500,000**	**-**					
Transfer Station System											
Coquitlam Transfer Station Compactor Replacement	Coquitlam	2,500,000	344,316	2,155,684	2,500,000	-	14%	Ongoing	Y		
Coquitlam Transfer Station Replacement	Coquitlam	77,600,000	33,520,223	44,079,777	77,600,000	-	43%	Ongoing	N		Facility expected to open in spring 2021
Maple Ridge Transfer Station Upgrades	Maple Ridge	2,000,000	-	2,000,000	2,000,000	-	0%	Not Started	Y		
North Shore Transfer Station Compactor Replacement	North Vancouver	2,500,000	-	2,500,000	2,500,000	-	0%	Not Started	Y		
Surrey Recycling and Waste Drop-Off	Surrey	62,300,000	14,633,768	47,666,232	62,300,000	-	23%	Ongoing	N		Facility expected to open in late 2021
Surrey Transfer Station Compactor Replacement	Surrey	2,500,000	-	2,500,000	2,500,000	-	0%	Not Started	Y		
		149,400,000	**48,498,307**	**100,901,693**	**199,700,000**	**(50,300,000)**					
Waste to Energy Facility											
Acid Gas Reduction	Burnaby	41,000,000	450,000	40,550,000	41,000,000	-	1%	Ongoing	Y		Operational Certificate amendment pending
Biosolids Processing	Burnaby	20,500,000	35,529	20,464,471	20,500,000	-	1%	Ongoing	Y		
Boiler Grate and Feed Table Supports Replacement	Burnaby	4,500,000	-	4,500,000	4,500,000	-	0%	Not Started	Y		
Bottom Ash Crane Replacement	Burnaby	1,500,000	-	1,500,000	1,500,000	-	0%	Not Started	Y		
Carbon Silo Replacement	Burnaby	2,400,000	-	2,400,000	2,400,000	-	0%	Not Started	Y		
Feed Hopper/Chute	Burnaby	2,600,000	-	2,600,000	2,600,000	-	0%	Ongoing	Y		
Feedwater Pump Replacement	Burnaby	1,000,000	284,000	716,000	284,000	716,000	99%	Ongoing	Y	(1)	
Generation Bank Replacement	Burnaby	9,000,000	-	9,000,000	9,000,000	-	0%	Not Started	Y		
Lime Silo Replacement	Burnaby	3,600,000	-	3,600,000	3,600,000	-	0%	Not Started	Y		
Primary Economizer Replacement	Burnaby	5,000,000	-	5,000,000	5,000,000	-	0%	Not Started	Y		
Refuse Crane	Burnaby	7,000,000	73,539	6,926,461	7,000,000	-	1%	Ongoing	Y		
Second Pass Superheater Replacement	Burnaby	5,500,000	2,384,566	3,115,434	5,484,000	16,000	66%	Ongoing	Y	(1)	
Secondary Economizers Replacement	Burnaby	6,000,000	-	6,000,000	6,000,000	-	0%	Not Started	Y		
Stack Refurbishment	Burnaby	350,000	-	350,000	350,000	-	0%	Not Started	Y		
		109,950,000	**3,227,635**	**106,722,365**	**109,218,000**	**732,000**					
Grand Total Solid Waste Services		**348,150,000**	**59,828,864**	**288,321,136**	**347,418,000**	**732,000**					

Notes:
(1) Contractor authorized expenditure amount

ATTACHMENT 3

Capital Project Status Information – Solid Waste Services
April 30, 2020

Major GVS&DD solid waste capital projects are proceeding on schedule and within budget. Project details are highlighted below:

Transfer Station Program

- The Coquitlam Transfer Station replacement project construction started in May 2018 with site grading works. The full construction contract was awarded in December 2018. Construction is currently underway with anticipated commissioning of the new transfer station scheduled for early 2021.
- The Surrey Recycling and Waste Drop-Off Facility project construction contract was executed in early June 2020. Construction began in July 2020 and is expected to take 15 months. Commissioning of the new facility is expected to occur in late 2021.

Landfills Program

- Construction of Phase 2 landfill gas collection system upgrades for the new Coquitlam Transfer Station are in progress. The system has been designed as a combination of an active system at buildings and a passive system over the remainder of the transfer station site. Installation of the active gas wells was completed in 2019. Installation of the passive system along with laterals and header pipes for the active system is anticipated to be completed in late 2020. A new control room at the blower flare station is required for the existing and future system upgrade. Design of the new control room is complete and construction is anticipated in 2021.

Waste-to-Energy Program

- The refuse crane replacement project commenced with preliminary engineering on February 14, 2019. The preliminary engineering report identified funding gaps which will be addressed through the 2021 budget cycle.
- The second pass superheater replacement project started on April 11, 2019. The replacement tubing has been received and installed on two boilers during the 2019 fall outages. Installation will occur on the final boiler during the spring outage which has been delayed to July 2020.
- The feedwater pump replacement project commenced on May 3, 2019. The pump was installed in November 2019 and commissioned in January 2020. Covanta is working with the pump manufacturer to confirm the pump operates at full specifications.
- The feed hopper / chute replacement project started on October 28, 2019. Quotations have been requested from vendors with the plan to install two units in fall 2020 and one unit in spring 2021.
- The biosolids processing preliminary design project started on October 28, 2019. Preliminary design work will continue through 2020.

metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Zero Waste Committee

From: Brent Kirkpatrick, Lead Senior Engineer, Solid Waste Operations, Solid Waste Services

Date: July 9, 2020 Meeting Date: July 17, 2020

Subject: **Waste-to-Energy Facility Environmental Monitoring and Reporting, 2019 Update**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated July 9, 2020, titled "Waste-to-Energy Facility Environmental Monitoring and Reporting, 2019 Update."

EXECUTIVE SUMMARY

The Metro Vancouver Waste-to-Energy Facility operates well within environmental standards and limits. All air emission related parameters monitored during 2019 were in compliance with Operational Certificate 107051. Continuous emissions monitoring data and all compliance reports are available on the Metro Vancouver website. Metro Vancouver has applied to the Ministry of Environment and Climate Change Strategy to defer a reduction in acid gas emission parameters to allow additional monitoring of ambient air quality in the vicinity of the Waste-to-Energy Facility. Metro Vancouver's existing ambient air monitoring system will be supplemented with new equipment at an existing monitoring station near to the Waste-to-Energy Facility and a new station will be installed immediately adjacent to the Waste-to-Energy Facility.

PURPOSE

The purpose of this report is to provide the Zero Waste Committee with an overview of the Waste-to-Energy Facility's environmental monitoring program and implementation of Operational Certificate requirements.

BACKGROUND

Metro Vancouver continuously monitors the environmental performance of the Metro Vancouver Waste-to-Energy Facility and since 2010, annual environmental performance summaries have been provided to the Zero Waste Committee for information.

This report provides updates on the facility's 2019 environmental performance and the implementation of the Waste-to-Energy Facility Operational Certificate requirements. The report is identified in the Zero Waste Committee annual work plan and as such is being brought forward at this time.

ENVIRONMENTAL MONITORING AND REPORTING UPDATE

Since the Waste-to-Energy Facility opened in 1988, Metro Vancouver has strived to continually reduce emissions through assessment, operational and plant infrastructure improvements and environmental controls. The Waste-to-Energy Facility is certified, on an annual basis, by the International Standards Organization to meet their Environmental Standard 14001. The certification requires an independent review of continuous improvement and compliance with all environmental regulations. In addition to satisfying regulatory requirements, environmental monitoring provides

Metro Vancouver with valuable data to assess existing plant operations and potential capital improvements.

To assess regulatory compliance, measurements from the environmental monitoring program are compared to the regulatory limits specified in the Waste-to-Energy Facility Operational Certificate 107051 issued by the BC Ministry of Environment and Climate Change Strategy. Results are reported in the following ways:

- Monthly compliance reports, which provide a summary of all air emissions monitoring results for each month, are provided to the BC Ministry of Environment and Climate Change Strategy, the City of Burnaby and the Fraser Health Authority, and are posted publicly on the Metro Vancouver website;
- Manual stack testing is conducted by an independent stack testing company four times a year for particulate matter, trace metals, total hydrocarbons, and hydrogen fluoride; and results are provided to the BC Ministry of Environment and Climate Change Strategy, City of Burnaby, Fraser Health Authority and posted publicly on the Metro Vancouver website;
- Stack testing for semi-volatile organic compounds is conducted once a year, and results are provided to the BC Ministry of Environment and Climate Change Strategy, City of Burnaby and Fraser Health Authority, and are posted publicly on the Metro Vancouver website;
- Annual reporting of greenhouse gas emissions is provided to both the BC Ministry of Environment and Climate Change Strategy and Environment and Climate Change Canada; and
- Annual reporting of substances emitted to air and contained in ash transferred for off-site disposal is provided to Environment and Climate Change Canada for the National Pollutant Release Inventory.

Environmental Monitoring Program

The 2019 Waste-to-Energy Facility environmental monitoring program consisted of the following:

- Air Emissions Monitoring – Continuous Emission Monitoring System:
    - The Waste-to-Energy Facility is equipped with a real-time flue gas continuous emission monitoring system that measures and records emission parameters at the exit of the air pollution control plant 24 hours per day, seven days a week, using a United States Environmental Protection Agency certified and auditable tracking system.
    - The following parameters are measured: sulphur dioxide, nitrogen oxides, carbon monoxide, carbon dioxide, hydrogen chloride, total hydrocarbons, and opacity.
    - The following key operational parameters are also monitored: furnace temperature, total flue gas flow, flue gas moisture and flue gas oxygen. This monitoring provides an indication of plant conditions and helps confirm that emissions monitored by manual stack testing are representative of year round conditions.

- Air Emissions Monitoring – Periodic Manual Stack Testing:
    - Four tests are conducted annually, one per quarter, in triplicate on each of the three plant lines to monitor for particulate matter, trace metals, total hydrocarbons and hydrogen fluoride.
    - A single test is conducted annually on one boiler (rotating between boilers each year) in triplicate to monitor for semi-volatile organic compounds, including dioxins and

furans, chlorobenzenes, chlorophenols, polychlorinated biphenyls and polycyclic aromatic hydrocarbons.

Fly and Bottom Ash Monitoring:

- Each fly ash load is tested prior to transport and disposal.
- Bottom ash samples are collected from each truck which is loaded with bottom ash for transport and disposal. Individual samples collected through the week are combined to form a composite sample which is tested weekly.

2019 Results

All air emission related parameters monitored during 2019 were in compliance with the requirements of Operational Certificate 107051. A summary of historic annual emission performance, including 2019 data, is included in the attachment.

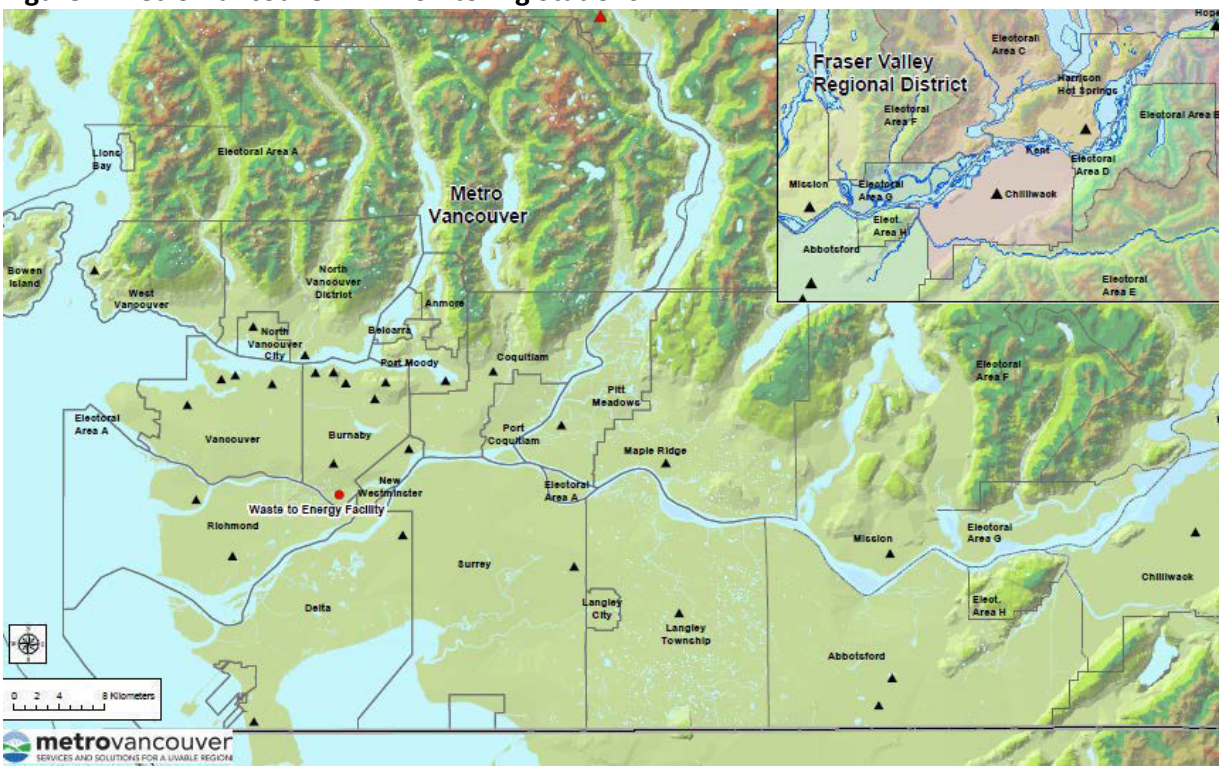
A non-ferrous recovery system was implemented in 2018 and has improved the physical and chemical characteristics of the bottom ash, increasing options for beneficial use of this material. As noted in this month's manager's report, procurement is underway for a business case for the beneficial use of bottom ash as an aggregate substitute to reduce regional disposal requirements by about 5%.

Operational Certificate Implementation

The Operational Certificate for the Waste-to-Energy Facility was issued by the BC Ministry of Environment and Climate Change Strategy on December 15, 2016. It includes response limits, discharge limits and other requirements.

Metro Vancouver has applied to the Ministry of Environment and Climate Change Strategy to amend the Operational Certificate for the Waste-to-Energy Facility. The amendment defers a reduction in discharge limits for sulphur dioxide and hydrogen chloride from December 31, 2022 to March 3, 2025. Dispersion modelling and a health risk assessment showed that at current Operational Certificate emission levels, sulphur dioxide and hydrogen chloride are not expected to exceed ambient air criteria. Delaying the reduction of limits for sulphur dioxide and hydrogen chloride would allow for further air monitoring to confirm ambient concentrations. By mid-2020, Metro Vancouver will install a new ambient air quality monitoring station at the Waste-to-Energy Facility site, and will install a hydrogen chloride monitor at the existing Burnaby South Monitoring Station to monitor ambient concentrations of emissions from the Waste-to-Energy Facility. A map of the 31 existing monitoring stations and the location of the new station at the Waste-to-Energy Facility is included in Figure 1. The draft amended Operational Certificate was posted for public comment in the Vancouver Sun and the Province on June 25 and July 6, 2020 and is available online at metrovancouver.org. Any feedback on the draft Operational Certificate will be reported back to the Board and the Ministry of Environment and Climate Change Strategy.

Figure 1 Metro Vancouver Air Monitoring Stations



Greenhouse Gas Emissions Reporting

In mid-2009, the federal and provincial governments each enacted legislation for mandatory reporting of greenhouse gas emissions for facilities with annual emissions above specified thresholds (50,000 (federal) and 10,000 (provincial) tonnes of carbon dioxide equivalent per year). Based on these thresholds, the Waste-to-Energy Facility is subject to federal and provincial reporting on both biogenic (renewable) and anthropogenic (man-made or non-renewable) greenhouse gas emissions.

2019 greenhouse gas emissions were verified by PwC Canada, and reported to the provincial and federal governments. Greenhouse gas emissions from the Waste-to-Energy Facility are comprised mainly of carbon dioxide with small amounts of methane and nitrous oxides. Total emissions are reported as carbon dioxide equivalents. Total 2019 greenhouse gas emissions were 274,151 tonnes, a decrease of approximately 1% compared to 2018. Of these emissions, 43% are anthropogenic and 57% are biogenic.

Anthropogenic greenhouse gas emissions for 2019 were 121,503 tonnes. Over the past three years, the anthropogenic portion of greenhouse gas emissions has ranged from 40% to 45%. As in past reporting years, the Waste-to-Energy Facility accounted for less than one percent of all anthropogenic greenhouse gas emissions in the region.

National Pollutant Release Inventory Reporting

The National Pollutant Release Inventory is Canada's legislated, publicly accessible inventory of pollutant releases to air, water and land, as well as from disposal and transfer for recycling. The National Pollutant Release Inventory is managed by Environment and Climate Change Canada and currently tracks over 300 substances and groups of substances. Metro Vancouver is required to

report air emissions (e.g., particulate matter, metals, organic compounds and acid gases) and substances transported for off-site disposal in fly ash and bottom ash for the preceding calendar year to the National Pollutant Release Inventory. The following table summarizes the 2019 National Pollutant Release Inventory reporting.

Table 1: 2019 National Pollutant Release Inventory Substance Reporting Summary

	Reported Quantity (tonnes)	
Substance	**Stack Emissions**	**Ash Disposal**
Nitrogen Oxides	221.1	N/A
Carbon Monoxide	48.3	N/A
Sulphur Dioxide	118.7	N/A
Hydrogen Chloride/Hydrochloric Acid	103.9	N/A
Aluminum (dust)	0.012	N/A
Arsenic	0.00065	1.79
Cadmium	0.00014	1.70
Cobalt	0.00014	1.37
Copper	0.00092	102.6
Lead	0.0015	31.8
Manganese	0.0013	30.4
Mercury	0.0016	0.072
Phosphorus	0.0020	559.1
Zinc	0.0059	245.3
Particulate Matter ≤ 10µm	1.1	N/A
Particulate Matter ≤ 2.5µm	0.90	N/A
Dioxins and Furans	N/A	N/A
Hexachlorobenzene	N/A	N/A

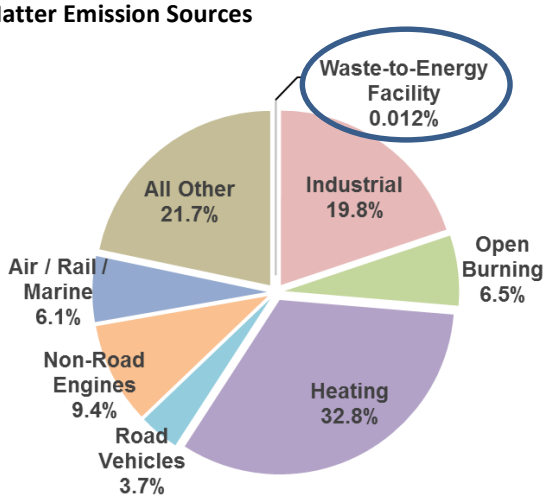
Notes:
- All other substances are below the National Pollutant Release Inventory level of quantification and are not required to be reported.
- 'N/A' indicates value is either below the level of quantification, below the detection limit, or the substance is not found in ash.
- Ash tonnages reported on a dry basis.

Waste-to-Energy Facility in a Regional Context

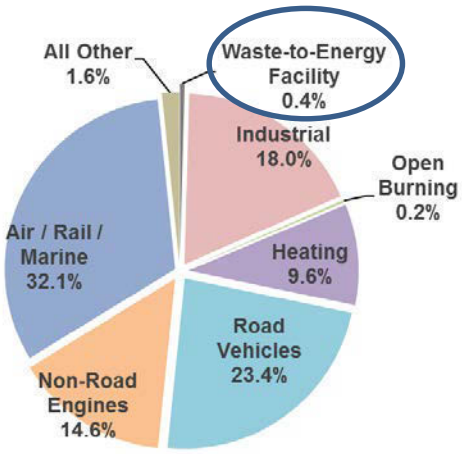
Figure 2 compares Waste-to-Energy Facility emissions to total emissions from all regional sources for two key air contaminants in the Lower Fraser Valley – fine particulate matter and nitrogen oxides (a key smog forming pollutant). In 2019, the Waste-to-Energy Facility accounted for 0.012% of regional fine particulate matter emissions and 0.4% of regional nitrogen oxide emissions. The Nitrogen Oxide Reduction Project, completed in October 2014, reduced nitrogen oxide emissions from 0.9% of the regional total in 2013 to 0.4% in 2019.

Figure 2: Regional Emissions Distribution (2019) – Fine Particulate Matter and Nitrogen Oxides

2019 Lower Fraser Valley Fine Particulate Matter Emission Sources



2019 Lower Fraser Valley Nitrogen Oxide Emission Sources



ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Activities related to emissions monitoring and reporting are included in the approved Solid Waste Services operational budget.

CONCLUSION

The Waste-to-Energy Facility operates well within environmental standards and limits. A range of projects that continuously improve the facility's environmental performance have been completed or are underway. All air emission related parameters monitored during 2019 were in compliance with Operational Certificate 107051. Continuous emissions monitoring data and all compliance reports are available on the Metro Vancouver website.

Attachment *(Orbit 40146003)*
Metro Vancouver Waste-to-Energy Facility Summary of Air and Metals Emissions 1988-2019

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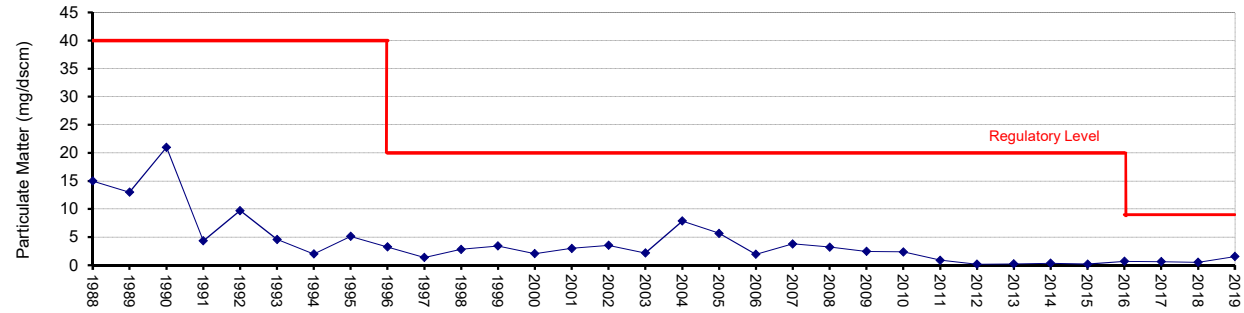
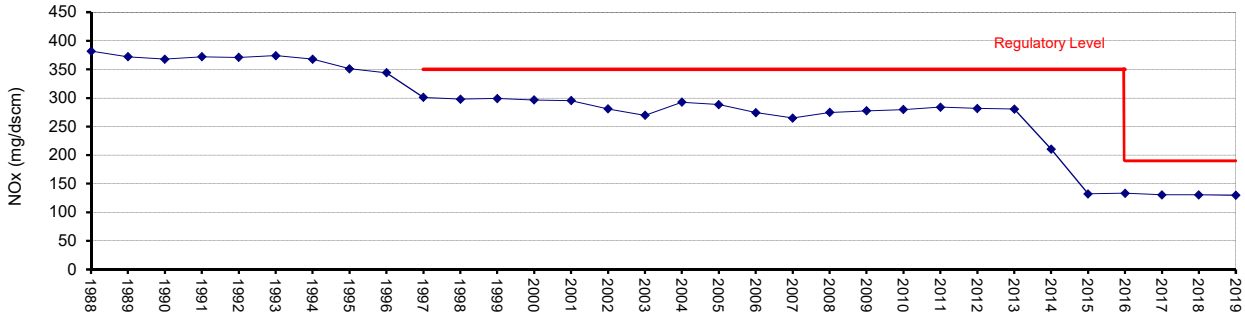
Metro Vancouver Waste-To-Energy Facility Summary of Air Emissions 1988 - 2019

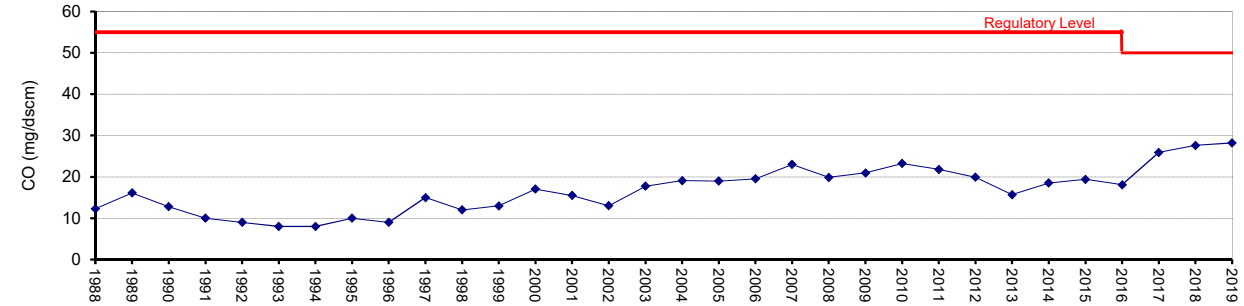
Particulate Matter



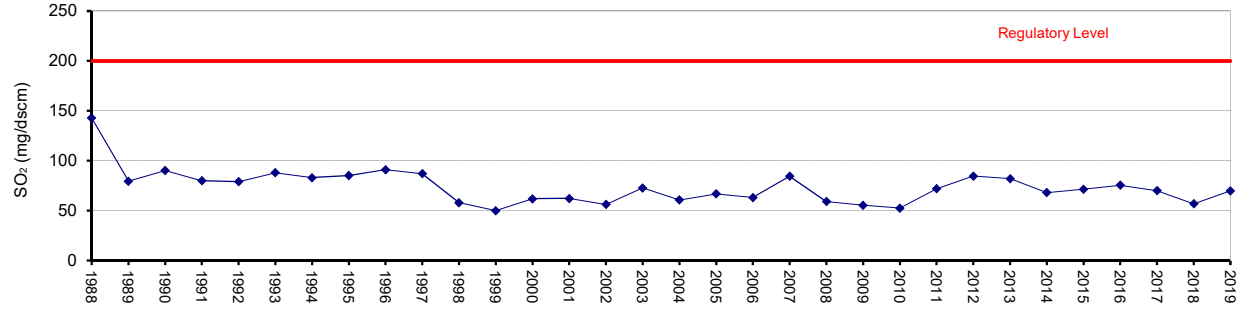
Nitrogen Oxides



Carbon Monoxide

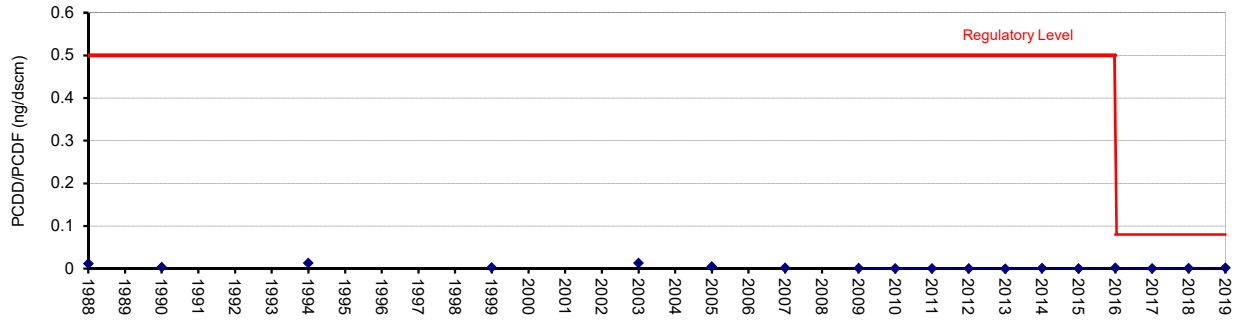


Sulfur Dioxide

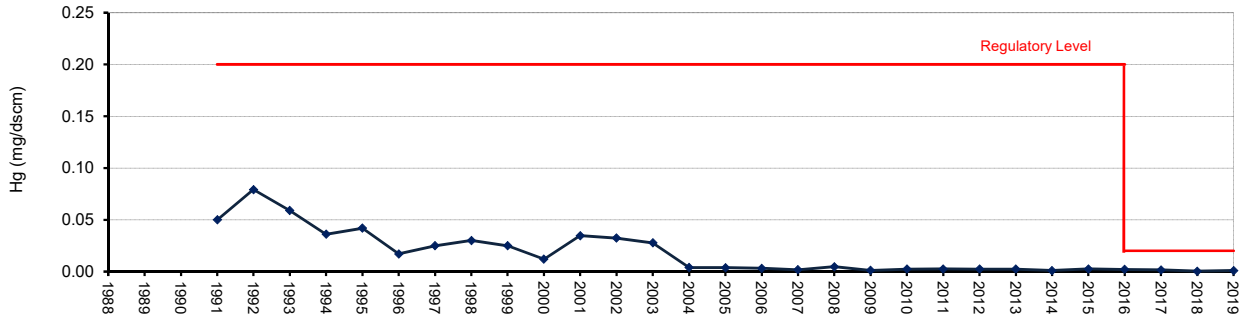


Metro Vancouver Waste-To-Energy Facility Summary of Air Emissions 1988 - 2019

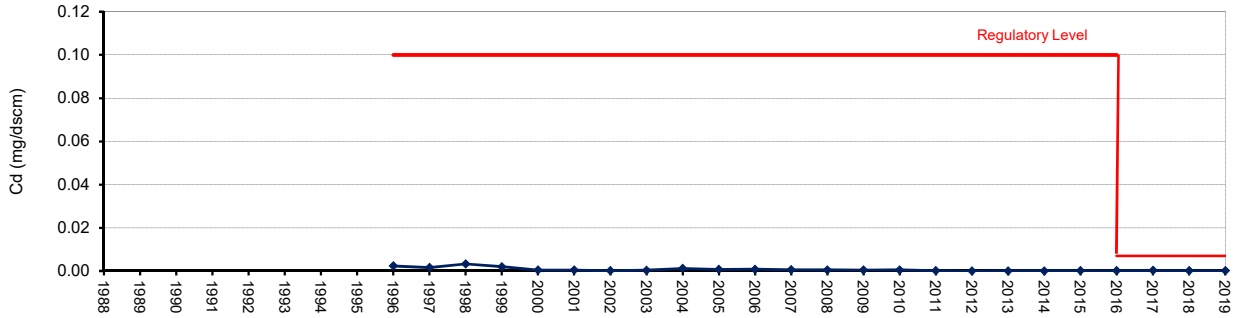
Dioxins/Furans



Mercury



Cadmium



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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Zero Waste Committee

From: Brent Kirkpatrick, Lead Senior Engineer, Solid Waste Operations, Solid Waste Services

Date: July 10, 2020 Meeting Date: July 17, 2020

Subject: **Waste-to-Energy Facility 2019 Financial Update**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated July 10, 2020, titled "Waste-to-Energy Facility 2019 Financial Update."

EXECUTIVE SUMMARY

The Metro Vancouver Waste-to-Energy Facility continues to be an environmentally sound, low-cost regional disposal option. In 2019, the Waste-to-Energy Facility processed 253,148 tonnes of municipal solid waste, at a net unit cost of $57.45 per tonne for operation and maintenance, a 9% cost reduction from 2017 to 2019. Waste-to-Energy Facility costs were reduced in 2018 and 2019 from the beneficial use of bottom ash in the construction of the replacement Coquitlam Transfer Station. Waste-to-Energy Facility debt costs reduced to zero in 2019 with the retirement of debt associated with the 2003 electricity turbo generator.

PURPOSE

The purpose of this report is to provide the Zero Waste Committee with a 2019 financial update for the Metro Vancouver Waste-to-Energy Facility located in Burnaby.

BACKGROUND

Annually, results of the operation of the Waste-to-Energy Facility and contract with Covanta Burnaby Renewable Energy, ULC (Covanta), including tonnages, expenditures, revenues, service level and performance, and unit costs, are provided to the Zero Waste Committee and Board for information.

2019 WASTE-TO-ENERGY FACILITY FINANCIALS

Table 1 provides the past three years of expenditures for the Waste-to-Energy Facility.

Table 1: 3-Year Expenditures for the Waste-to-Energy Facility

	2017	2018	2019
Operating Cost	$20,575,965	$19,617,423	$20,539,052
Debt Charges *	$1,700,248	$879,800	$0
Total Expenditure	$22,276,213	$20,497,223	$20,539,052
Tonnage	259,748	253,123	253,148
Unit Cost / Tonne **	$85.76	$80.98	$81.13

* Debt charges are payments for principles and interests on long term financing.

** Includes debt servicing costs.

Operating costs include operations and maintenance of the Waste-to-Energy Facility and ash management (additional information on ash management provided below in table). No debt charges were incurred in 2019 due to completion of debt payments for the 2003 turbo generator installation.

Table 2: Metro Vancouver's Bottom Ash and Fly Ash Disposal costs for the Waste-to-Energy Facility

	2017	2018	2019
Fly Ash Disposal	$1,368,291	$1,385,142	$1,453,703
Bottom Ash Disposal	$1,211,348	$257,461	$559,382
Disposal Costs / Tonne of Incoming Waste	$9.93	$6.49	$7.95

Ash management costs have decreased over the last two years with the beneficial use of bottom ash in the construction of the replacement Coquitlam Transfer Station starting in October 2017. In 2019, bottom ash was used as part of the transfer station construction until August 5, 2019. Metro Vancouver has initiated procurement for long-term beneficial use of bottom ash.

Table 3 below outlines Metro Vancouver's portion of offsetting revenues. Electrical revenue in 2019 was slightly higher compared to 2017 and 2018, due to reduced down time at the facility. The 2019 metal revenue includes the first full year of operation of the non-ferrous metals recovery system.

Table 3: Metro Vancouver's Portion of Electrical and Metal Revenues for the Waste-to-Energy Facility

	2017	2018	2019
Electrical Revenue	$5,642,942	$5,584,341	$5,793,404
Metals Revenue	$140,325	$191,495	$199,889
Tonnage	259,748	253,123	253,148
Unit Revenue / Tonne	$22.26	$22.82	$23.68

Table 4 shows net cost per tonne for the Waste-to-Energy Facility from 2017 to 2019. A 9% reduction in net costs was achieved from 2017 to 2019.

Table 4: 3-Year Net Unit Cost for Operation and Maintenance of the Waste-to-Energy Facility (including debt servicing)

	2017	2018	2019
Unit Cost / Tonne (from Table 1)	$85.76	$80.98	$81.13
Unit Revenue/ Tonne (from Table 3)	$22.26	$22.82	$23.68
Net Unit Cost/ Tonne	$63.50	$58.16	$57.45

ALTERNATIVES

This is an information report, therefore no alternatives are presented.

FINANCIAL IMPLICATIONS

2019 Waste-to-Energy Facility costs benefited from the elimination of debt payments related to the 2003 turbo generator installation and reduced ash management costs with the beneficial use of bottom ash in the construction of the replacement Coquitlam Transfer Station. Metro Vancouver continues to work with Covanta to minimize facility costs and overall, the Waste-to-Energy Facility continues to be a low-cost regional disposal option.

CONCLUSION

Expenditures in 2019 for the Waste-to-Energy Facility totaled $20.5 million, resulting in an expenditure of $81.13 per tonne. Metro Vancouver's portion of electrical and metals revenues totaled $5,993,303 or $23.68 per tonne. Based on the plant processing 253,148 tonnes of municipal solid waste, the net unit cost per tonne for operation and maintenance of the Waste-to-Energy Facility in 2019 was $57.45 per tonne. Tipping fee revenues are accounted for separately and are not included in this analysis.

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