City of Richmond

REVISED
Agenda

Public Works and Transportation Committee

Council Chambers, City Hall
6911 No. 3 Road

Tuesday, March 16, 2021
4:00 p.m.

Pg. # ITEM

MINUTES

PWT-3 ***Motion to adopt the minutes of the meeting of the Public Works and Transportation Committee held on February 17, 2021.***

NEXT COMMITTEE MEETING DATE

April 20, 2021, (tentative date) at 4:00 p.m. in Council Chambers

DELEGATION

ADDED **PWT-96** 1A. Richard Schwartz, Richmond resident, to speak on adding a crosswalk to access Manoah Steves Park.

PLANNING AND DEVELOPMENT DIVISION

1. **TRANSLINK 2019 TRANSIT NETWORK REVIEW - CONSULTATION RESULTS**
(File Ref. No. 01-0154-04/2021-Vol 01) (REDMS No. 6598445)

PWT-7 See Page **PWT-7** for full report

Designated Speaker: Donna Chan

STAFF RECOMMENDATION

That the report titled "TransLink 2019 Transit Network Review - Consultation Results" dated January 26, 2021, from the Director, Transportation be received for information.

ENGINEERING AND PUBLIC WORKS DIVISION

2. **2021 LIQUID WASTE MANAGEMENT PLAN BIENNIAL REPORT**
(File Ref. No. 10-6000-01/2021-Vol 01) (REDMS No. 6606775)

PWT-14

See Page **PWT-14** for full report

Designated Speaker: Jason Ho

STAFF RECOMMENDATION

That the staff report titled "2021 Liquid Waste Management Plan Biennial Report," dated February 12, 2021, from the Director, Engineering, be submitted to Metro Vancouver.

3. **LOWER MAINLAND FLOOD MANAGEMENT STRATEGY UPDATE**
(File Ref. No. 10-6060-01/2021-Vol 01) (REDMS No. 6620375)

PWT-87

See Page **PWT-87** for full report

Designated Speakers: Jason Ho and Corrine Haer

STAFF RECOMMENDATION

That the staff report titled "Lower Mainland Flood Management Strategy Update", dated February 19, 2021, from the Director, Engineering, be received for information.

4. **MANAGER'S REPORT**

ADJOURNMENT

City of Richmond

Minutes

Public Works and Transportation Committee

Date: Wednesday, February 17, 2021

Place: Council Chambers
Richmond City Hall

Present: Councillor Chak Au, Chair
Councillor Alexa Loo (by teleconference)
Councillor Linda McPhail (by teleconference)
Councillor Michael Wolfe (by teleconference)

Call to Order: The Chair called the meeting to order at 4:00 p.m.

MINUTES

It was moved and seconded
That the minutes of the meeting of the Public Works and Transportation Committee held on January 19, 2021, be adopted as circulated.

CARRIED

NEXT COMMITTEE MEETING DATE

March 16, 2021, (tentative date) at 4:00 p.m. in Council Chambers

PLANNING AND DEVELOPMENT DIVISION

1. **RICHMOND ACTIVE TRANSPORTATION COMMITTEE – PROPOSED 2021 INITIATIVES**
(File Ref. No. 01-0100-20-RCYC1) (REDMS No. 6583418 v. 2)

In reply to queries from Committee, staff noted that (i) education regarding use of a multi-use pathway can be provided to the community, and (ii) the Alderbridge Greenway project is currently in its second phase and final design and should be complete in 2021

It was moved and seconded

(1) That the proposed 2021 initiatives of the Richmond Active Transportation Committee, as outlined in the staff report titled "Richmond Active Transportation Committee - Proposed 2021 Initiatives" dated January 4, 2021 from the Director, Transportation, be endorsed; and

(2) That a copy of the report titled "Richmond Active Transportation Committee – Proposed 2021 Initiatives" be forwarded to the Richmond Council-School Board Liaison Committee for information.

CARRIED

2. **TRAFFIC SAFETY ADVISORY COMMITTEE - PROPOSED 2021 INITIATIVES**

(File Ref. No. 01-0100-30-TSAD1-01) (REDMS No. 6593164 v. 3)

In reply to queries from Committee, staff noted that future reports can include metrics and data with regard to effectiveness of the programs.

Committee requested that staff ensure that residents in the Holly area of Richmond are included in the Traffic Safety Advisory Committee work to observe appropriate pick-up and drop-off zones for school and notify residents.

It was moved and seconded

(1) That the proposed 2021 initiatives for the Traffic Safety Advisory Committee, as outlined in the staff report titled "Traffic Safety Advisory Committee - Proposed 2021 Initiatives" dated January 4, 2021 from the Director, Transportation, be endorsed; and

(2) That a copy of the staff report titled "Traffic Safety Advisory Committee - Proposed 2021 Initiatives" be forwarded to the Richmond Council-School Board Liaison Committee for information.

CARRIED

ENGINEERING AND PUBLIC WORKS DIVISION

3. **PROPOSED 2021 PAVING PROGRAM**
(File Ref. No.) (REDMS No. 6528529 v. 6)

In reply to queries from Committee, staff noted that (i) the reclaimed asphalt pavement held up well during the snow; however, once the rains begin deterioration will be monitored, (ii) in 2021 use of reclaimed asphalt pavement will be examined for local roads, (iii) should this material be successful during the trials, it will be used as the standard performance measure and the whole industry will move towards this standard, and (iv) any requests received from the public with regards to paving is investigated and add locations to the program as required.

It was moved and seconded
That the staff report titled, "Proposed 2021 Paving Program," dated January 18, 2021, from the Director, Engineering be received for information.

CARRIED

4. **SOUTH DIKE REPAIRS – GILBERT ROAD AREA**
(File Ref. No. 10-6050-01) (REDMS No. 6603864 v. 7)

It was moved and seconded
That funding of $500,000 from the Drainage Improvement Reserve Fund be approved to complete dike armouring repairs and debris removal along the south dike at Gilbert Road, and be included in the Consolidated 5 Year Financial Plan (2021-2025) accordingly.

The question on the motion was not called as in reply to queries from Committee, staff noted that (i) the larger logs are smashing into the rip-rap armouring and damaging it, (ii) a qualified environmental professional is advised with regard to bird nesting, and (iii) project signage will be installed with contact information and single lane alternating traffic would be used if necessary.

The question on the motion was then called and it was **CARRIED**.

5. **MANAGER'S REPORT**

(i) Weekend Snow and Ice Event

Staff highlighted that as a result of the snowfall on the weekend (i) 8900 lane kms were brined around the City, (ii) 30 snow angel volunteers attended 38 residents and helped remove snow, and (iii) the City handled the snowfall successfully.

(ii) Pemberton Drive

The Chair advised that a request from the residents on Pemberton Drive is forthcoming with regard to installing speed bumps in the area, and directed staff to follow-up.

(iii) City of Richmond Cones around Debris

In reply to queries from Committee, staff noted that it is standard practice to place a cone around garbage or debris until the appropriate equipment or resources are available to address the situation and the work will be logged for tracking purposes.

ADJOURNMENT

It was moved and seconded
That the meeting adjourn (4:22 p.m.).

CARRIED

Certified a true and correct copy of the Minutes of the meeting of the Public Works and Transportation Committee of the Council of the City of Richmond held on Wednesday, February 17, 2021.

Councillor Chak Au
Chair

Sarah Goddard
Legislative Services Associate

City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	January 26, 2021
From:	Lloyd Bie, P.Eng. Director, Transportation	**File:**	01-0154-04/2021-Vol 01
Re:	**TransLink 2019 Transit Network Review - Consultation Results**		

Staff Recommendation

That the report titled "TransLink 2019 Transit Network Review - Consultation Results" dated January 26, 2021, from the Director, Transportation be received for information.

Lloyd Bie, P.Eng.
Director, Transportation
(604-276-4131)

Att. 1

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Economic Development	☑	
Policy Planning	☑	
SENIOR STAFF REPORT REVIEW	**INITIALS:**	**APPROVED BY CAO**

6598445

Staff Report

Origin

At its March 25, 2019 meeting, Council endorsed TransLink's proposed transit network changes in Richmond for the purpose of public consultation and directed staff to "*report back on the results of the public consultation and TransLink's final decisions regarding the proposed service changes.*"

Following TransLink's publication of its 2019 Transit Network Review, this report responds to the referral.[1]

This report supports Council's Strategic Plan 2018-2022 Strategy #5 Sound Financial Management:

> *Accountable, transparent, and responsible financial management that supports the needs of the community into the future.*
>
> *5.4 Work cooperatively and respectfully with all levels of government and stakeholders while advocating for the best interests of Richmond.*

This report supports Council's Strategic Plan 2018-2022 Strategy #6 Strategic and Well-Planned Growth:

> *Leadership in effective and sustainable growth that supports Richmond's physical and social needs.*
>
> *6.3 Build on transportation and active mobility networks.*

Analysis

Public Consultation Results and TransLink Actions

During April 2-18, 2019, TransLink held a consultation process with a variety of engagement techniques (Figure 1) that included four bundles of proposed transit changes in Richmond (Attachment 1). The proposed changes were based on recommendations of the Southwest Area Transport Plan (SWATP), which includes Richmond, and customer feedback. TransLink published the outcome in its "2019 Transit Network Review" (the Report) in 2020 and the results relevant to Richmond are summarized below.

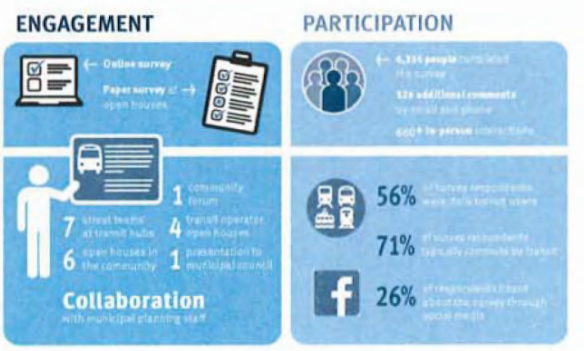


Figure 1: Summary of TransLink Engagement

[1] The TransLink report can be accessed at: https://www.translink.ca/-/media/translink/documents/plans-and-projects/managing-the-transit-network/2019-transit-network-review-report.pdf.

N10 and N15: Downtown-YVR-Richmond NightBus

The N10 operates between downtown Vancouver and Richmond City Centre via Vancouver International Airport (YVR). There is a service gap as the N10 provides service to YVR only until 3:30 am while the Canada Line does not start service until 5:00 am. Per the SWATP, TransLink proposed to:

- Route the N10 between the City Centre, Bridgeport Station and downtown Vancouver, and discontinue the deviations to YVR; passengers destined for YVR from Richmond to transfer at Bridgeport Station
- Extend the N15 from Marine Drive to YVR via Bridgeport Station for all trips
- Extend the N15 service hours to YVR until the first Canada Line train in the morning

There was strong support for the proposal; 75% of respondents (total of 502 surveys completed) indicated support or strong support. At the time of writing its Report, TransLink intended to implement the changes in 2020. Implementation was suspended due to the COVID-19 pandemic and is now pending TransLink's development of a new 10-Year Investment Plan.

408: Ironwood-Richmond Centre

The 408 travels directly along Williams Road to No. 5 Road in the eastbound direction but, in the westbound direction, it detours via King Road and Seacote Road to Williams Road. TransLink proposed a two-way service along Williams Road in response to customer requests to provide more consistent and clear service.

There was notable opposition to the proposal; 44% of respondents (total of 404 surveys completed) indicated opposition or strong opposition. Based on the engagement results and an evaluation of customer benefits and trade-offs, TransLink will not proceed with the proposal.

407: Steveston-Gilbert-Bridgeport-Knight

The 407 is a long route connecting Steveston to Knight Street in Vancouver and is frequently unreliable due to congestion through City Centre. In addition, demand between Steveston and City Centre is much higher than the remainder of the route. Per the SWATP, TransLink proposed splitting the 407 with:

- The 407 West - connecting Steveston to Bridgeport Station (instead of Richmond-Brighouse Station) via Lansdowne Road and Garden City Road.

- The 407 East - connecting Bridgeport Station to Knight Street via the Vulcan Way industrial area.

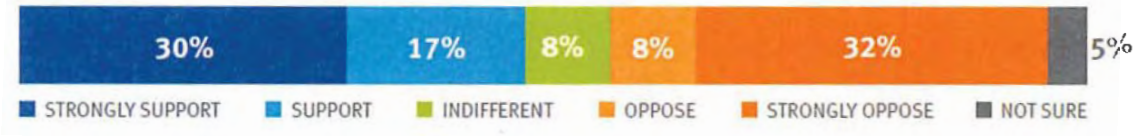
There was support for splitting the 407; 58% of respondents (total of 390 surveys completed) indicated support or strong support. Many customers requested increased frequency of the 407 while there was some concern about the loss of service at two bus stops on Garden City Road near Cook Road.

Based on the engagement results and an evaluation of customer benefits and trade-offs, TransLink will implement the redesign of the 407, introduce new transit service on Gilbert Road and Lansdowne Road, and maintain service to bus stops on Garden City Road with the 405 service. At the time of writing its Report, TransLink intended to implement the changes in 2021. Implementation is now pending TransLink's development of a new 10-Year Investment Plan.

404, 405 and 416: Riverside-No. 5 Road-Bridgeport

The 405 is a long, circuitous route that provides indirect service and often experiences delays through City Centre. Demand for transit service is increasing at both Riverside Industrial Park and the residential developments along River Drive. Per the SWATP, TransLink proposed to:

- Redesign the 404 to end at Riverside Industrial Area.
- Redesign the 405 to continue straight on No. 5 Road and connect to Bridgeport Station via River Drive.
- Redesign the 416 to serve Westminster Highway and No. 4 Road, and end at Jacombs Road-Cambie Road with the 410 continuing to serve the Crestwood business area along No. 6 Road.



There was strong support for straightening the 405; many of those who responded positively liked the more direct connections and many were strongly in support of new service coverage along No. 5 Road and to the developing residential areas along River Drive (total of 546 surveys completed). Conversely, there was concern about the loss of service to Viking Way and the surrounding employment area. Many of those opposed to the changes for the 416 wanted the service maintained to Crestwood Corporate Centre, and cited overcrowding on the 410 as a barrier to switching to that route.

Based on the engagement results and an evaluation of customer benefits and trade-offs, TransLink will defer implementation and undertake further analysis and planning to address concerns about service loss to Viking Way and the surrounding employment area. This work will be coordinated with future planning work of the R7 RapidBus alignment between Richmond and the Expo Line.

Financial Impact

None.

Conclusion

The planned transit network changes in Richmond identified by TransLink will expand transit coverage to new areas of the city and improve reliability. Implementation of the changes is pending TransLink's development of a new 10-Year Investment Plan, which is planned to be completed by June 2021.

JCaravan

Joan Caravan
Transportation Planner
(604-276-4035)

JC:jc

Att. 1: TransLink Proposed 2019 Transit Network Changes in Richmond

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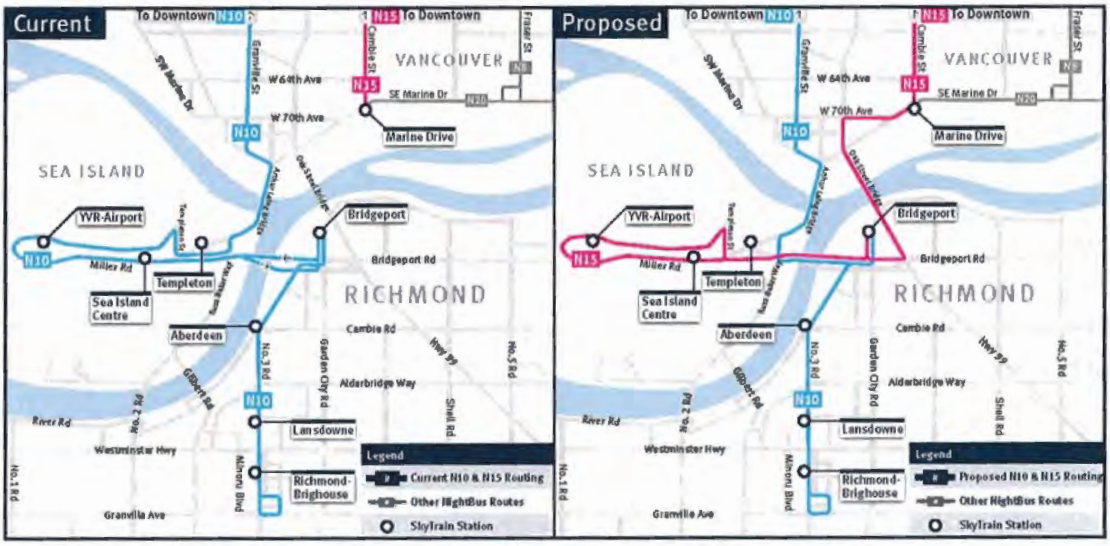
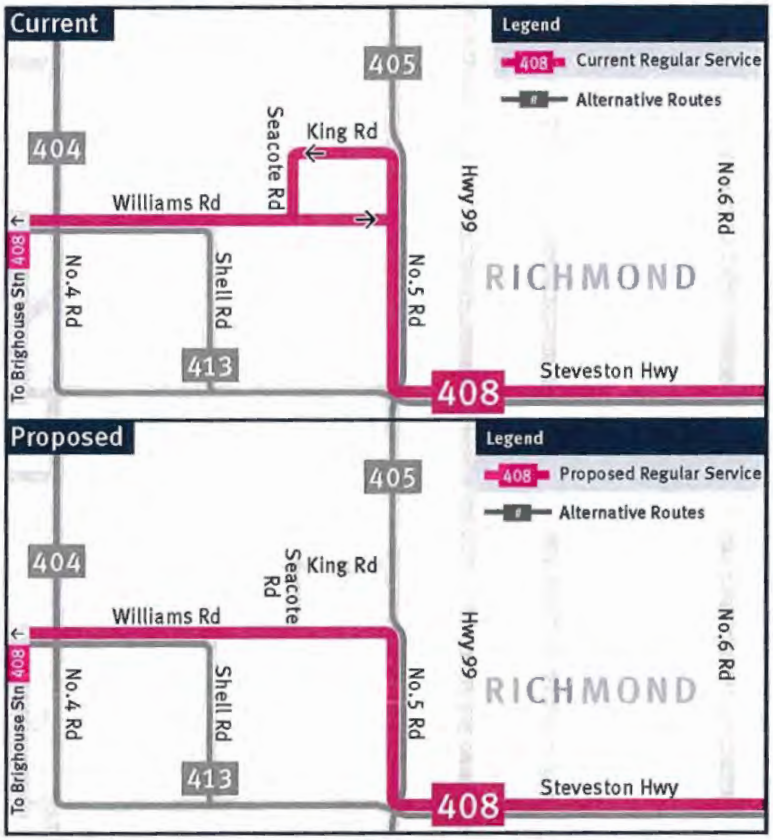
TransLink Proposed Transit Network Changes



N10 and N15: Downtown-YVR-Richmond NightBus



408: Ironwood-Richmond Centre

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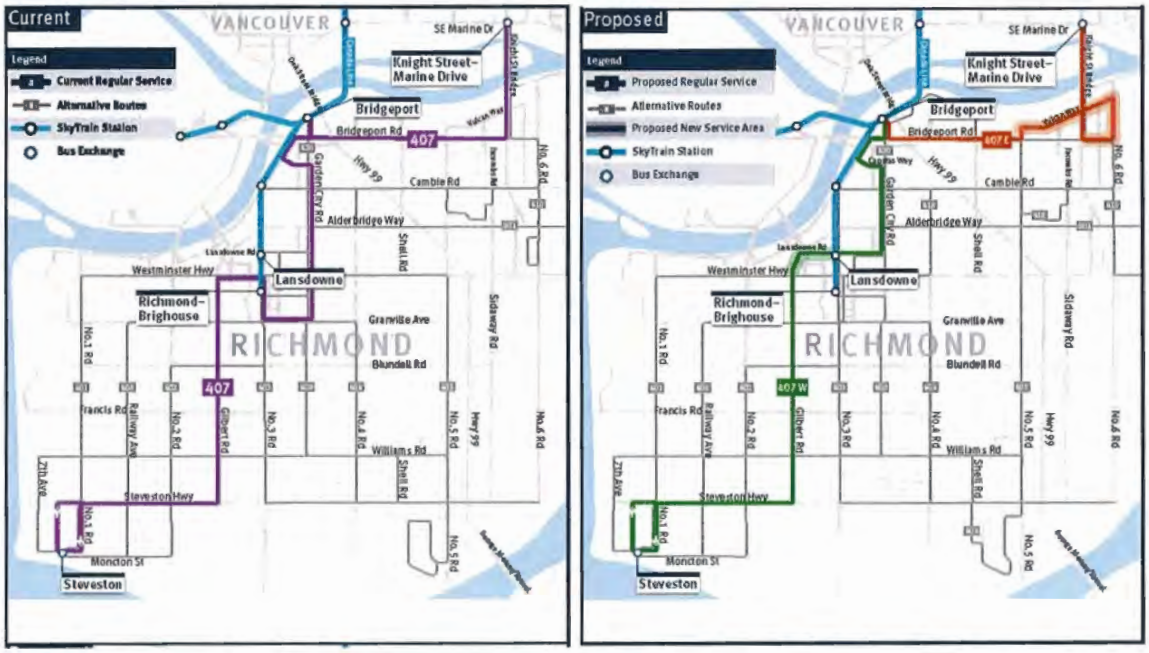
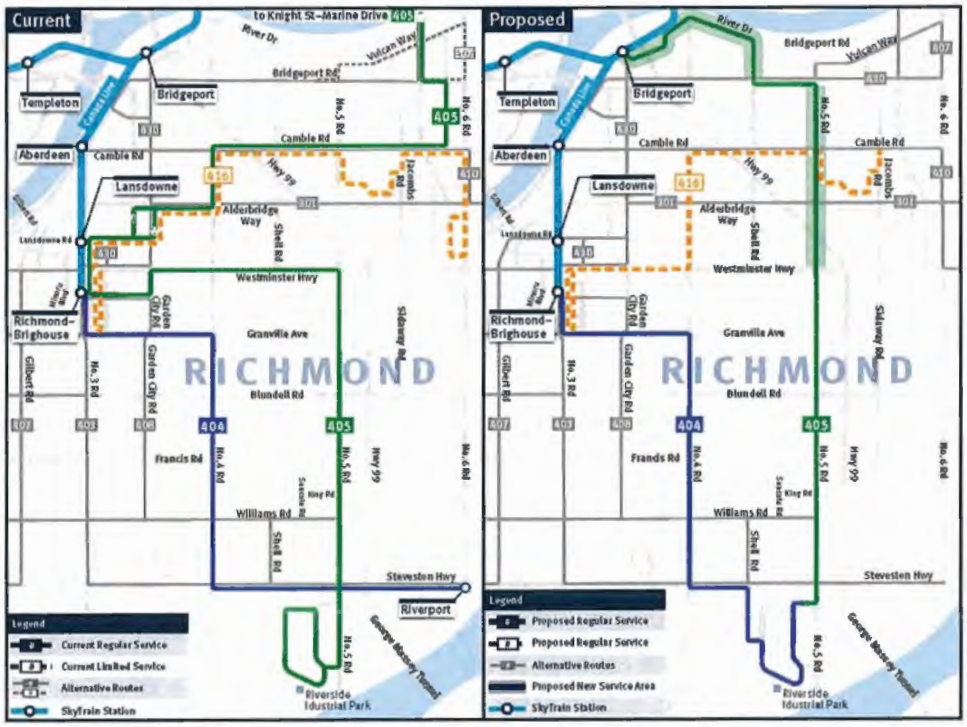
TransLink Proposed Transit Network Changes



407: Steveston-Gilbert-Bridgeport-Knight



404, 405 and 416: Riverside-No. 5 Road-Bridgeport

6598445

City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	February 12, 2021
From:	Milton Chan, P.Eng. Director, Engineering	**File:**	10-6000-01/2021-Vol 01
Re:	**2021 Liquid Waste Management Plan Biennial Report**		

Staff Recommendation

That the staff report titled "2021 Liquid Waste Management Plan Biennial Report," dated February 12, 2021, from the Director, Engineering, be submitted to Metro Vancouver.

Milton Chan, P.Eng.
Director, Engineering
(604-276-4377)

Att. 1

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Public Works Sustainability & District Energy	☑ ☑	
SENIOR STAFF REPORT REVIEW	**INITIALS:**	**APPROVED BY CAO**

6606775

Staff Report

Origin

The Greater Vancouver Sewerage and Drainage District (GVS&DD) Board adopted the Integrated Liquid Waste and Resource Management Plan (the "Liquid Waste Plan") in May 2010. Subsequently, at the September 27, 2010 City of Richmond Regular Council Meeting, Council adopted the following motion:

> *"That the municipal commitments in the Metro Vancouver 2010 Integrated Liquid Waste and Resource Management Plan be endorsed."*

The Minister of Environment approved the Liquid Waste Plan, subject to conditions identified in his letter, dated May 30, 2011.

The Liquid Waste Plan requires member municipalities to report progress on 27 municipal commitments on a biennial basis. The Liquid Waste Plan Biennial Report will be compiled by Metro Vancouver and submitted to the Minister of Environment once it is approved by the GVS&DD Board.

This staff report summarizes the City's progress on the Liquid Waste Plan municipal actions and presents the 2021 Liquid Waste Management Plan Biennial Report (the "2021 Biennial Report") (Attachment 1) for Council's endorsement for submission to Metro Vancouver for incorporation into the Liquid Waste Plan Biennial Report.

This report supports Council's Strategic Plan 2018-2022 Strategy #1 A Safe and Resilient City:

> *1.2 Future-proof and maintain city infrastructure to keep the community safe.*

This report supports Council's Strategic Plan 2018-2022 Strategy #2 A Sustainable and Environmentally Conscious City:

> *2.2 Policies and practices support Richmond's sustainability goals.*

This report supports Council's Strategic Plan 2018-2022 Strategy #5 Sound Financial Management:

> *5.4 Work cooperatively and respectfully with all levels of government and stakeholders while advocating for the best interests of Richmond.*

Analysis

The Liquid Waste Plan includes a municipal commitment to report progress on a biennial basis. The 2021 Biennial Report covers the 2019 to 2020 reporting period. Richmond has previously submitted 8 biennial reports over the last 18 years based on reporting requirements in the current and previous Liquid Waste Management Plans.

The 2021 Biennial Report includes 27 narratives, several tables and graphics attachments that report on the 27 municipal commitments included in the Liquid Waste Plan. The following are highlights of Richmond's 2021 Biennial Report:

Inflow and Infiltration

Inflow and infiltration of stormwater into the sanitary sewer system are typically caused by cross-connections or defects in the infrastructure and place additional demands on the sanitary system. Liquid Waste Plan action 1.1.18 requires municipalities to develop and implement inflow and infiltration management plans that ensure inflow and infiltration levels are within Metro Vancouver allowances. Richmond does not have combined sewers and does not permit unregulated groundwater discharge into the sanitary sewer system. The City continues to manage inflow and infiltration by addressing defects through its sanitary sewer assessment and rehabilitation program.

Metro Vancouver targets a 20-year cycle for inspection of regional sanitary sewers. Richmond commenced CCTV inspections of its gravity sanitary sewers in 2002 and completed by 2015, seven years ahead of Metro Vancouver's target. Rehabilitation of damaged mains identified through inspections are brought forward through the annual capital program. Included as part of the approved 2020 capital program, staff have been proactively planning for the next cycle of inspection work, positioning the City to continue exceeding Metro Vancouver targets.

Staff continue to monitor inflow and infiltration levels at the City's sanitary pump stations, identifying any catchments that may have higher inflow and infiltration rates for subsequent study and remediation if required. Richmond is currently a leader within the region in managing and reducing inflow and infiltration in its sanitary sewer system.

Asset Management Plan

Liquid Waste Plan action 3.1.8 requires municipalities to develop and implement asset management plans and to provide copies of those plans to Metro Vancouver by 2014. Richmond maintains both an Ageing Utilities Infrastructure Management Plan and a Growth Related Infrastructure Management Plan that are reviewed and updated regularly. Both of these have been in place for a number of years and were submitted ahead of Metro Vancouver's target date.

Sanitary Sewer Overflows

Liquid Waste Plan action 3.3.7 requires municipalities to report on the frequency and location of sewerage overflows from municipal sanitary sewers. The City does not have sanitary sewer overflow issues and there were zero overflows for the reporting period. This is largely due to Richmond's successful capital and maintenance programs and separated sewer systems.

Stormwater Management Plan

Liquid Waste Plan action 3.4.7 requires municipalities to develop and implement stormwater management plans that integrate with land use. Richmond has developed an Integrated Rainwater Resource Management Strategy (IRRMS), a strategic approach to manage stormwater within the City's floodplain ecosystem. It identifies strategies to detain stormwater, improve

water quality, control sediments, harvest and re-use rainwater, and protect and enhance green infrastructure. Richmond's Ecological Network Management Strategy (ENMS) contains actions and initiatives on the integration of rainwater management Best Management Practices tailored to various land uses within the City.

Key actions in this reporting period include:

- Implemented the Council endorsed Mitchell Island Environmental Stewardship Initiatives program and as part of this initiative:
    - Obtained Federation of Canadian Municipalities funding (Green Municipal Fund) for the Mitchell Island Storm Water Feasibility Study; and
- Updated the City's Dangerous Goods Spill Response Plan, which identifies the risk assessment, prevention initiatives, as well as the preparedness, response and recovery measures in place to manage dangerous goods and pollution incidents in the City.

Water Metering

Ministerial Condition 2 for approval of the Liquid Waste Plan strongly encourages municipalities to create business cases and/or implement residential water metering programs and to consider municipal rebate programs for water-efficient fixtures and appliances to reduce water use.

The City is a regional leader in water metering and has a comprehensive water meter program for both residential and commercial properties. All single-family, industrial, commercial, institutional and farm properties in Richmond are metered. Multi-family complexes can volunteer for water meters through a subsidized program comprised of a meter installation subsidy complemented by a five-year guarantee that allows residents to adjust water use habits without financial risk. As of the end of 2020, 50% of multi-family properties are metered in Richmond and approximately 96% of those customers saved money compared to the flat rate.

Water metering provides customers increased rate equity compared to the flat rate and a tool to manage their costs, while consumption monitoring allows staff to identify system inefficiencies. Since 2003, the City has managed to reduce total water consumption despite a 25% population increase. By reducing water consumption, the City achieved a cost reduction of over $10 million in Metro Vancouver water purchase costs in 2019 alone. This is a strong indication that water metering efforts to date are having a positive impact on water conservation and minimizing the need for costly infrastructure upgrades by managing increases in demands.

Universal deployment of the fixed base water meter reading network throughout the City was previously endorsed by Council. The fixed base network facilitates automated data collection, reduces costs associated with reading water meters, allows staff to gather real-time consumption data, assists customers in identifying causes of leaks and water consumption habits, and enhance revenue forecasting which will inform the utility budget process. The fixed base network has been deployed and is in the final stages of system optimization

To further promote reduced water use, the City provides metered customers with water conservation kits, which include low flow showerheads, faucet aerators, toilet fill cycle diverters, toilet leak detection tablets, and educational water conservation tools. In addition, the City has

successful programs for toilet rebates, rain barrels, and clothes washer rebates. To the end of 2020, program totals of 9411 toilet rebates, 1802 rain barrels, and 1369 clothes washer rebates have been issued to Richmond residents.

Financial Impact

None.

Conclusion

The 2010 Liquid Waste Plan includes a municipal commitment to report progress on Liquid Waste Plan actions on a biennial basis. The attached 2021 Biennial Report summarizes Richmond's progress on municipal actions for the 2019 to 2020 reporting period. Staff will continue to work on municipal actions identified in the Liquid Waste Plan to ensure the City of Richmond is meeting all of the requirements.

Jason Ho, P. Eng.
Manager, Engineering Planning
(604-244-1281)

JH:al

Att. 1: City of Richmond 2021 Liquid Waste Management Plan Biennial Report

6606775

2021 Liquid Waste Management Plan Biennial Report

Reporting Period: 2019 – 2020

Municipal Submission Section

To be completed by: March 1, 2021

Questions and submittal through Metro Vancouver at
2021biennialreport@metrovancouver.org

Municipal Contact Information			
Name	**Email**	**Phone**	**Responsible For ILWMP Action #**
Jason Ho	Jho@richmond.ca	(604)-244-1281	
Peter Russell	PRussell2@Richmond.ca	(604) 276-4130	1.1.16, 1.1.21, 1.3.17, 3.3.6, 3.4.7 Ministerial Conditions (7,9)
Chris Chan	Cchan2@richmond.ca	(604)-204-8516	

6599619

List of Content

Submission Checklist

Narratives:

☒ Narrative 1: *Summarize ongoing permitting & inspection progroms*

☒ Narrative 2: *Summarize opprooch to reguloting pesticides ond lown care products*

☒ Narrative 3: *Summarize updates to outreach plons for supporting liquid waste source control programs (e.g. stormwater, sewer use, sewer maintenance, I&I management, cross connections etc.) during the reporting period*

☒ Narrative 4: *Summarize I&I management plans & list key actions resulting from plons*

☒ Narrative 5: *Summarize enforcement enhancements and process efforts during reporting period*

☒ Narrative 6: *Highlight and summarize bylow changes relating to stormwater management*

☒ Narrative 7: *Highlight and summarize changes to utility design standards and neighbourhood design guidelines in relation to on-site rainwater management*

☒ Narrative 8: *Summarize development af municipal sanitary averflow management plans. Highlight specific examples.*

☒ Narrative 9: *Highlight & summarize progress on the prevention of CSOs and the separatian of combined sewers*

☒ Narrative 10: *List approaches and strategies that address risks (ie: regular maintenance, SCADA, monitoring, protocals, identified redundancies/contingencies)*

☒ Narrative 11: *Describe regulatians and status of applications*

☒ Narrative 12: *Summorize existing municipal odour control programs and the implementation af new programs for targeted municipal sewer facilities*

☒ Narrative 13: *Summarize air emissions management pragrams for standby pawer generators at municipal sewer pump stations*

☒ Narrative 14: *Summarize air emissions management pragrams for standby power generatars at municipal sewer pump stations.*

☒ Narrative 15: *Summarize key pragress on the assessment and condition of municipal sewerage system*

☒ Narrative 16: *Summarize key progress ar accamplishments an the development of asset management plans far municipal sewerage infrastructure*

☒ Narrative 17: *Summarize key findings from the tri-annual internal audit*

☒ Narrative 18: *Summarize the estimate of greenhouse gos emissions and odours associated with the operation of municipal and regianal liquid waste management systems*

☒ Narrative 19: *Summarize ond highlight any important details and oction plans reloting to wet weather SSOs & probably causes of CSOs*

☒ Narrative 20: *Summarize ond highlight any changes to the existing municipol sewer flow & sewer level monitoring network*

☒ Narrative 21: *Summarize progress on the development of emergency monogement strategies and response plons for municipal & regionol wostewater collection ond treotment systems*

☒ Narrative 22: *Summorize key initiatives that support the adaptotion of infrastructure & operations to address risks ond long term needs*

☒ Narrative 23: *Summarize and highlight key initiatives reloting to the development and implementation of the integrated monogement plons*

☒ Narrative 24: *Discuss woter metering & rebate progroms reloting ta water fixtures and oppliances*

☒ Narrative 25: *Summarize whether any new municipal water metering policies or programs were introduced in the last repart that oddress this action. If no changes, then indicate, "Same as the 2017-2018 reporting period: no changes".*

☒ Narrative 26: *Quote relevant OCP sections addressing stormwater, stream health ond their consideration of ISMPs*

☒ Narrative 27: *Describe any changes to prooctive planning processes as listed in Ministeriol Condition 9 for 2019-2020 ond provide examples.*

Tables:

Graphics & GIS Data:

☒ Attachment 1:

- I&I Mapping showing I&I rates for neighbourhoods where studies have been completed with before and after I&I (L/ha·d). Objectives to Illustrates catchment areas covered by I&I studies.
- Transmit an electronic copy of GIS shape files for study catchment boundaries to Metro Vancouver

☐ Attachment 2:

- Mapping showing where sewer separation work occurred in 2019-2020
- GIS shape files of the locations where sewer separation occurred in 2019-2020 for composite mapping
- GIS shape files of catchments of remaining combined sewer catchments as of December 31, 2020 (if separated catchments discharge to combined sewers, code the separated catchments as "separated").

☐ Attachment 3:

- Map and GIS data showing location of emergency municipal overflows (this information should have already been provided through a separate request through the REAC LWSC as well as the last reporting period. If already provided, please indicated so.

☒ Attachment 4:

- 2019-2020 map showing odour control facilities & locations of complaints (different than facility)
- GIS shape files for the odour facility and complaint mapping to allow for development of composite mapping

☒ Attachment 5:

- A map showing sewerage system CCTV inspection for 2019-2020 and the other areas of CCTV inspection work in a different colour over the previous 20 years (2000-2020).
- A map showing any sewer replacement /rehabilitation work for 2019-2020 as part of either asset management or capacity upgrades. Indicate whether the work is for upgrades or maintenance.

☒ Attachment 6:

- Titles of any completed asset [replacement] management plans (author, date, title, and publisher) for 2019-2020.
- Completed annual PSAP 3150 reporting on asset values for 2019-2020.
- Colour coded map showing age of the sewerage system (i.e.: <1900, 1901-1925, 1926-1950, 1951-1975, 1976-2000, >2001) updated to show any changes made in 2019-2020. If no changes, please indicate so and the mapping prepared for the 2017-2018 reporting period can be used.

☐ Attachment 7:

- Provide (if not already provided) GIS shape files which have the locations of the CSO outfalls for purposes of summary mapping (should already be reported under WSER).
- Provide GIS shape files or coordinates for the locations of wet & dry weather SSOs for each year (indicate which is dry/wet and year). Include SSO dates and estimated volume

☒ Attachment 8:

- Map and GIS coordinates showing locations of active municipal sewer flow/level monitors for the reporting period 2019-2020 (indicate whether permanent or temporary)

☐ Attachment 9:

- If not already provided, provide updated GIS shape files of the municipal sanitary sewer network, including manholes, pump stations, pipe diameters for the municipal sewer system as of the end of 2020. Please indicate what changes have been made for 2019-2020.

☒ Attachment 10:

- GIS shape files showing the ISMP boundaries and their status: Development Phase= Yellow; Implementation Phase = Light Green; Completed Phase = Dark Green. Add ISMPs still to start development as outlined only).

☐ Attachment 11:

- If initiated, results per watershed (as per ISMP Adaptive Management Framework)
- If undertaken, a map plus GIS shape files/coordinates showing location of monitoring.

☐ Attachment 12:

- Map showing any 2019-2020 changes to protected riparian areas & possible stream classifications. If no changes, then this figure is not required.

City of Richmond

Action 1.1.14 – Review and enhance sewer use bylaws to reduce liquid waste at source, including contaminants identified by the *Canadian Environmental Protection Act (2012).*

Table 1 Core Sewer Use Bylaws

Sewer Use Bylaws*	2019-2020 Changes**
Drainage, Dyke and Sanitary Sewer System Bylaw No. 7551	No changes
Public Health Protection Bylaw No. 6989	No changes
Pollution Prevention and Clean-Up Bylaw No. 8475	No changes

**Re-list existing core sewer use bylaws and list all new bylaws*

***Summarize any changes (if no changes, enter "No changes")*

Table 2 Summarize Status of Bylaws Related to Controlling Sediment Transport & Erosion

Name of Bylaw* (related to controlling sediment release from land clearing and construction phase of development)	
Drainage, Dyke and Sanitary Sewer System Bylaw No. 7551 – requires that connections to the City's drainage system are disconnected and capped prior to demolition of buildings to prevent sediment entering the drainage system. ***Pollution Prevention and Clean-Up Bylaw No. 8475*** – prohibits the release of polluting substance into the receiving environment, and requires that no discharge from dewatering may enter the City's drainage system or watercourse without a Permit with the City. Such Permits require a Qualified Environmental Professional (QEP) to provide a Water Quality Monitoring Response Plan and a signed and sealed QEP declaration confirming the discharge water will meet minimum standards of the City, and will not cause harm to the receiving water body. ***Boulevard and Roadway Protection and Regulation Bylaw No. 6366*** – requires that anyone using a boulevard for construction to ensure that the roadway is cleared of sediment producing material during the activity. ***Boulevard Maintenance Bylaw No. 7174*** – Requires that a property owner not discard any materials fronting their property. ***Watercourse Protection and Crossing Bylaw No. 8441*** – limits the obstruction of flow, and requires that watercourse crossing design, construction and maintenance are approved by the City so as to protect water quality and the functioning of the City's drainage system or any City land. ***City of Richmond Engineering Design Specifications*** – requires that catch basins and inspection chambers be installed on all drainage service pipes to prevent sediment discharging into the City's drainage system. It also requires that a Sediment Control Plan be submitted to the City to identify the type and location of sediment control best management practices that will be used during construction.	
Bylaw Details	**2019-2020 Changes***
Summarize monitoring requirements	No changes
How data is assessed under the bylaw?	No changes
How is assessment used to initiate corrective actions?	No changes

Summarize approaches used to maintain compliance with the bylaw (e.g. annual resources dedicated to maintaining compliance).	No changes
Discuss effectiveness of bylaw/bylaws and current approach to prevent inputs of sediment to the storm system and receiving environment.	No changes

**For new or changed bylaws since 2017-2018, summarize any changes in 2019-2020 (if no changes in a section, enter "No changes").*

Action 1.1.15* – Continue existing programs of permitting and inspection to support and enforce sewer use bylaws (*Ongoing, *City of Vancouver Only*).

Narrative 1: Summarize ongoing permitting & inspection programs

Insert Narrative Text Here

Table 3 Types and Number of Liquid Waste Related Permits Issued 2019-2020

Permit Type/Name*	Number of Permits*	Referenced Bylaw*

**City of Vancouver Only*

Action 1.1.16 – Identify and regulate pesticides and lawn care products which negatively affect rainwater runoff quality and urban stream health *(2014).*

Narrative 2: Summarize approach to regulating pesticides & lawn care products for 2019-2020.

Adopted in 2009, Richmond's Enhanced Pesticide Management Program (EPMP) reduces the exposure of Richmond residents to unnecessary pesticide use. The program includes a regulation restricting the use of pesticides for cosmetic purpose, as well as resources to empower community members to make the switch to pesticide-free practices. In December of 2015, the City adopted the Invasive Species Action Plan (ISAP), intended to build upon the accomplishments of the EPMP. ISAP includes strategies to reduce the economic and environmental risks of invasive species management by implementing monitoring and control procedures and increasing awareness of invasive species within the community. ISAP delivers the City's early detection and rapid response program for public and private lands in order to ensure that pesticides and lawn-care products are deployed minimally and in a highly controlled fashion.

The City's Pesticide Use Control Bylaw No. 8514 restricts the cosmetic use of pesticides on residential and municipally-owned lands. In addition to bylaw enforcement, the City provides an expanded

Education and Community Partnerships Program to inform the community about pesticide restrictions and to promote natural gardening and pest solutions. This includes a series of annual natural gardening workshops, a phone line to help residents learn proper plant care and sustainable pest solutions, and information sheets available through the City's website.

Table 4 Products Regulated to Protect Stormwater Runoff Quality

Regulated Products	**Type of Regulation** *(Sales Ban, Use Ban, Permit, Limited Users, etc.)*	**Additional Information** *(Referenced Bylaw & Policy Numbers)*
Pesticides	Limited users	Pesticide Use Control Bylaw No. 8514 – Amendment Bylaw 9574.

Action **1.1.17** – Continue outreach plans to support liquid waste source control programs *(Ongoing)*.

Narrative 3: Summarize 2019-2020 updates to outreach plans for supporting liquid waste source control programs (e.g. stormwater, sewer use, sewer maintenance, I&I management, cross connections etc.).

Green Cart Program

Richmond residents have access to food scraps recycling services with the Green Cart Program since 2013. The Green Cart Program reduces the amount of waste that would otherwise be discharged to the sanitary sewer through garburators. Through the Green Cart program, 45,000 tonnes of food scraps and yard trimmings were collected. To facilitate grease reduction in the sanitary system, Richmond conducts the following activities:

- Provide Green Cart Program literature, which includes information on the impact of grease on the sewer system as well as proper grease disposal techniques, noting that small amounts of grease and oil that can be absorbed by newspaper or paper towel should be recycled in the Green Cart.
- Cooking oil and animal fat continue to be accepted at the City's Recycling Depot.
- Promote proper disposal of cooking oil and grease through the annual collection calendar/recycling guide, Green Cart brochure, Annual Report, City website, social media and community outreach which includes recycling workshops , booths at community events and recycling information sessions in multi-family buildings.
- Discourage the use of garburators as part of the Green Cart Program.

- Carry out the Green Cart and Recycling Depot programs, which allow residents to recycle food scraps and solid grease. Signage at the depot for oil and grease recycling simplifies the drop off process for residents.

Metro Vancouver Waste Water Discharge Permit Process

The City continues to participate in the Metro Vancouver sanitary sewer source control program by supporting the Metro Vancouver Waste Water Discharge Permit process.

Fat, Oil and Grease Reduction Programs

The City maintains a Grease Management Program which includes grease source control, sanitary sewer system monitoring and inspection, an on-going maintenance work. Bylaw enforcement staff continued to work with representatives from Metro Vancouver, stakeholder groups, industry associations, pumping operators and grease trap vendors to mitigate the impact of fats, oils and grease on the region's sanitary sewer system.

In 2019, a dynamic FOG map was developed linking FOG condition inspections of mains and access chambers to identify areas of concern. The FOG mapping will inform effective allocation of source identification, awareness education, bylaw enforcement, and condition based maintenance resources.

Rainwater Best Management Practices

Richmond's Official Community Plan Bylaw No. 9000 – Schedule 1, Section 14.2.10, Development Permit Guidelines – Green Buildings and Sustainable Infrastructure, provides general direction in regards to the voluntary undertaking, where feasible, of green building and sustainable infrastructure to support City of Richmond sustainability objectives and help reduce the demand for energy and resources. Developers are encouraged to incorporate green roofs, bio-swales, infiltration and other best management practices throughout the building site to store rainwater, mitigate urban heat island effect, reduce heating and cooling loads and reduce the impact on City drainage systems.

Richmond's Integrated Rainwater Resource Management Strategy contains initiatives to strategically implement stormwater detention and rainwater re-use measures and encourage stormwater detention on private properties in order to reduce stormwater runoff. In addition, the strategy works to strengthen erosion and sediment control and encourage water quality improvements.

Richmond's Ecological Network Management Strategy (ENMS) was adopted in 2015 and provides the ecological blueprint for the City to protect, connect and enhance the natural and green spaces throughout Richmond and beyond. It is an opportunistic approach for managing and guiding decisions regarding the city-wide system of natural areas and the ecosystem services they provide. It is designed to complement existing development processes and regulations in order to integrate ecological connectivity and health into all neighbourhoods and land-uses. The ENMS contains extensive actions and initiatives on the integration of rainwater management Best Management Practices tailored to various land uses within the city. These include green infrastructure (e.g. rain gardens, swales,

harvesting) development in parks and through planning processes, riparian corridor enhancements, and the review and update of bylaws.

Mitchell Island Environmental Stewardship Initiative

Council endorsed the Mitchel Island Stewardship Initiative in 2019 to promote stewardship and improve the Island's stormwater quality under the Bylaw No. 8475. As part of this initiative, the City of Richmond received a Federation of Canadian Municipalities Green Municipal Fund Grant in 2020 to improve stormwater quality on Mitchell Island. Mitchell Island is an important industrial hub within the City of Richmond that is connected to the ecologically sensitive Fraser River through the City's drainage infrastructure. Persistent environmental concerns have been noted in the area and, in response, Richmond has implemented a program to promote environmental stewardship among local business owners, to assess and monitor the health of the island environment, and to improve collaboration between staff and senior governments. The program has generated new levels of cooperation amongst stakeholders on Mitchell Island, and identified and mitigated numerous sources of Fraser River water contamination with a comprehensive stormwater sampling component. Many businesses, once made aware of their impacts, have been quick to install pollution mitigation infrastructure such as settling ponds, pH correcting technologies, impervious surfaces, and wheel washes, resulting in measurable improvements to island storm discharge water quality.

Rain Barrel Program

The City offers rain barrels to Richmond residents at subsidized prices.

Low-Flow Toilet Rebate Program

The City offers a $100 rebate to residents for replacing old toilets with new low-flush toilets to reduce waste volume through water conservation.

High-Efficiency Clothes Washer Rebate Program

The City partnered with BC Hydro to offer a maximum $100 rebate to residents for replacing old clothes washers with new energy- and water- efficient models, in order to reduce GHGs through energy conservation as well as waste volume through water conservation.

Water Meter Programs

The City maintains an advanced water metering program to encourage water conservation. All commercial and industrial water use is metered. The Universal Water Metering program for all single-family properties was completed by the end of 2017. The City continues to maintain a volunteer water metering program for multi-family properties that includes mandatory metering of new multi-family complexes, subsidizing installation costs for existing multi-family complexes (up to the greater of $1,200 per unit or $100,000 per complex for the actual installation cost), and a five-year guarantee that allows residents to adjust water use habits without financial risk. Currently 50% of the multi-family units in

Richmond have been metered for water and approximately 96% of metered multi-family complexes saved money compared to the flat rate.

Water metering provides customers increased rate equity compared to the flat rate and a tool to manage their costs while consumption monitoring allows staff to identify leaks and system inefficiencies to minimize wastage. Since 2003, the City has managed to reduce total water consumption despite a 25% population increase. By reducing water consumption, the City achieved a cost reduction of over $10M in Metro Vancouver water purchase costs in 2019 alone. This is a strong indication that water conservation efforts to date are have been effective in reducing water use and sewerage discharge correspondingly to minimize capital replacement needs.

The City continues to leverage its water meter infrastructure to further enhance customer service and water conservation strategies through a fixed based network. This advanced metering infrastructure provides staff with real-time consumption data that can help customers identify leaks, inform water consumption habits, and enhance revenue forecasting.

Action 1.1.18 – Develop and implement inflow and infiltration management plans, using the Metro Vancouver template as a guide, to ensure wet weather inflow and infiltration volumes are within Metro Vancouver's allowances as measured at Metro Vancouver's flow metering stations *(2012)*.

Narrative 4: Summarize I&I management plans & list key actions resulting from plans in 2019-2020. If no work was initiated or undertaken for 2019-2020, then indicate "Same as the last reporting period: no changes".

Richmond monitors I&I at the catchment level through pump runtimes at sanitary pump stations. Automated pump runtime data collection has been set up through the SCADA network and detailed pump runtimes are captured in data loggers that are manually downloaded to spreadsheets and subsequently converted to sanitary flow rates.

Richmond has installed pressure sensors at sanitary pump stations and continues to install magnetic flow meters at new sanitary pump stations. The City is assessing automated pump station data analysis tools to help determine catchments with excessive I&I for further study. Additional rainfall sensors have been installed to more accurately identify the sanitary system response to rainfall events. This study will include a review of sanitary system response to rainfall events.

Richmond began CCTV inspections of its gravity sanitary sewers in 2002. By 2015, CCTV inspections have been completed for 100% of Richmond's gravity sewers. A dynamic GIS layer was introduced in 2018 linking CCTV inspection videos to the asset management system enhancing access and documentation of inspection results and asset condition assessments. The CCTV inspection layer will be leveraged for the next cycle of sanitary sewer CCTV inspections.

Attachment 1:

a) I&I Mapping showing I&I rates for neighbourhoods where studies have been completed with before and after I&I (L/ha·d). Objectives to Illustrates catchment areas covered by I&I studies.

b) Transmit an electronic copy of GIS shape files for study catchment boundaries to Metro Vancouver.

Action 1.1.19 – Enhance enforcement of sewer use bylaw prohibition against the unauthorized discharge of rainwater and groundwater to sanitary sewers *(2010).*

Narrative 5: Summarize enforcement enhancements and process effort changes during 2019-2020. If no changes, then enter "Same as the last reporting period: no changes".

Same as the last reporting period: no changes.

Table 5 Bylaws Regulating Discharges of Groundwater and Rainwater to Sanitary Sewers

Regulation or Bylaw No.	Date	Summary of Any Changes 2019-2020*
Drainage, Dyke and Sanitary Sewer System Bylaw No. 7551	Effective Date – January 1, 2003	No changes
Pollution Prevention and Clean-Up Bylaw No. 8475	Effective Date- October 13, 2009	No changes

**if no changes, enter "no changes" in table.*

Action 1.1.20 – Update municipal bylaws to require on-site rainwater management sufficient to meet criteria established in municipal integrated stormwater plans or baseline region-wide criteria *(2014).*

Narrative 6: Highlight and summarize any bylaw changes or development effort relating to stormwater manogement for 2019-2020. If no changes, indicate "Same as the last reporting period: no changes".

The region wide baseline has been approved by the Board for use by Municipalities and ISMP's should be in implementation phase. Please list below the bylaws requiring on-site stormwater management per this action.

Same as the last reporting period: no changes.

Table 6 Bylaws Related to On-site Stormwater Management

Related Stormwater Bylaws	Changes to On-Site Stormwater Management Target/Objectives (2019-2020)*
Green Roofs & Other Options Involving Industrial & Office Buildings Outside the City Centre Bylaw No. 8385	No changes
Official Community Plan Bylaw No. 9000	No changes regarding on-site stormwater management
Pollution Prevention and Clean-Up Bylaw No. 8475	No changes

**if no changes, enter "no changes" in the table.*

Action 1.1.21 – Update municipal utility design standards and neighbourhood design guidelines to enable and encourage on-site rainwater management *(2014)*.

Narrative 7: Highlight and summarize changes for 2019-2020 to utility design standards and neighbourhood design guidelines in relation to on-site rainwater management. If no changes were made or processes initiated, then indicate "Same as the 2017-2018 reporting period: no chonges".

Mitchell Island Environmental Stewardship Initiative

In November 2020, the City of Richmond received a federation of Canadian Municipalities Green Municipal Fund Grant to improve stormwater quality on Mitchell Island. Mitchell Island is an important industrial hub within the City of Richmond that is connected to the ecologically sensitive Fraser River through the City's drainage infrastructure. Persistent environmental concerns have been noted in the area and, in response, Richmond has implemented a program to promote environmental stewardship among local business owners, to assess and monitor the health of the island environment, and to improve collaboration between staff and senior governments. The program has generated new levels of cooperation amongst stakeholders on Mitchell Island, and identified and mitigated numerous sources of Fraser River water contamination with a comprehensive stormwater sampling component. Many businesses, once made aware of their impacts, have been quick to install pollution mitigation infrastructure such as settling ponds, pH correcting technologies, impervious surfaces, and wheel washes, resulting in measurable improvements to island storm discharge water quality.

Table 7 Municipal Standards, Guidelines and Policy Changes Related to On-site Stormwater Management

Name of Standard, Guideline or Policy	Changes for 2019-2020
City of Richmond Engineering Design Specifications	No changes with respect to rainwater management.
City of Richmond Integrated Rainwater Resource Management Strategy	No changes with respect to rainwater management.
City of Richmond Ecological Network Management Strategy	No changes with respect to rainwater management.

Mitchell island Environmental Stewardship Initiative Update	Endorsed by Council

**Summarize any changes from the last report (if no changes, enter "No changes"). Otherwise, briefly summarize if a new bylaw.*

Action 1.2.5 –	Work with Metro Vancouver to develop and implement municipal-regional sanitary overflow management plans as set out in 1.2.4 *(2013)*.

Narrative 8: Summarize development of any municipal sanitary overflow management plans for 2019-2020. Highlight any specific examples. If no new plans developed, then indicate "Same as the last reporting period: no changes".

Same as the last reporting period: no changes.

Action 1.2.6 –	Burnaby, New Westminster and Vancouver will work with Metro Vancouver to give effect to 1.2.2 and, specifically, implement plans to prevent combined sewer overflows by 2050 for the Vancouver Sewerage Area and 2075 for the Fraser Sewerage Area and separate combined sewers at an average rate of 1% and 1.5% of the system per year in the Vancouver Sewerage Area and Fraser Sewerage Area respectively *(Ongoing)*.

Narrative 9: Highlight and summarize progress on the prevention of CSOs and the separation of combined sewers for 2019-2020.

Not applicable as there are no combined sewers in Richmond.

Attachment 2:

a) *Mapping showing where sewer separation work occurred in 2019-2020*

b) *GIS shape files of the locations where sewer separation occurred in 2019-2020 for composite mapping*

c) *GIS shape files of catchments of remaining combined sewer catchments as of December 31, 2020 (if separated catchments discharge to combined sewers, code the separated catchments as "separated").*

N/A

Action 1.3.11 – Develop and implement operational plans for municipal sewerage facilities to ensure infrastructure reliability and optimal performance *(Ongoing).*

Narrative 10: Discuss approaches and strategies applied in 2019-2020 that address risks (i.e. regular maintenance, SCADA, monitoring, protocols, identified redundancies/contingencies). If these are the same as the previous reporting period, then indicate "no changes", or if only minor changes, enter appropriate text similar to "Same as the last reporting period except for..."

Same as the last reporting period: no changes. **Action 1.3.12** – Work with Metro Vancouver to develop and implement emergency sanitary sewer overflow plans including contingency plans to minimize impacts of unavoidable sanitary sewer overflows resulting from extreme weather, system failures or unusual events *(Ongoing).*

Narrative 8: Identify any emergency procedures & protocols developed for 2019-2020. If these are the same as the previous reporting period, then indicate "Same as the last reporting period: no changes", or if only minor changes, enter appropriate text similar to "Same as the last reporting period except for..."

Richmond's municipal sanitary system did not experience any sanitary sewer overflows during the reporting period. Richmond does not have any combined sewer systems. Richmond does not have chronic sanitary sewer overflow issues due to weather or rainfall. There have been no changes to the emergency management plan, procedures, and protocols outlined for the 2017-2018 reporting period.

Attachment 3:

Map and GIS data showing location of emergency municipal overflows (unless there are updates, this information should have already been provided through a separate request through the REAC LWSC as well as in the 2017-2018 reporting). If already provided, please indicated so.

Action 1.3.13 – Work with private marina operators, Ministry of Environment and Environment Canada to develop and implement regulations to ensure all new marinas and marinas where planned renovations exceed 50% of the assessed existing improvements value have pleasure craft pump-out facilities *(Ongoing).*

Table 8 Bylaws and Regulations Requiring Pleasure Craft Pump-out Facilities at Marinas

Regulation Process or Bylaw*	Date*
Public Health Protection Bylaw No. 6989,	Effective Date –

Subdivision Two – Marina Health and Safety Regulation	March 13, 2000

** If these are the same as the previous reporting period 2017-2018, then indicate "Same as the last reporting period: no changes".*

Action 1.3.14 – Require all pleasure craft pump-out facilities to connect to a municipal sanitary sewerage system or a provincially permitted on-site treatment and disposal system or have established enforceable protocols for transporting liquid waste for disposal at a permitted liquid waste management facility *(Ongoing).*

Narrative 11: Describe any additional regulations and the number of on-site treatment systems required/installed during the reporting period 2019-2020. If these are the same as the previous reporting period 2017-2018, then indicate "Same as the last reporting period: no changes".

Same as the last reporting period: no changes.

Action 1.3.15 – Continue existing municipal odour control programs and implement new programs for targeted municipal sewer facilities *(Ongoing, see Action 3.3.4).*

Narrative 12: Summarize existing municipal odour control programs and the implementation of new programs for targeted municipal sewer facilities for the reporting period 2019-2020. If these are the same as the previous reporting period 2017-2018 then indicate "Same as the 2017-2018 reporting period: no changes", or if only minor changes, enter appropriate text similar to "Same as the 2017-2018 reporting period except for..."

Same as the 2017-2018 reporting period: no changes.

Attachment 4:

a) *2019-2020 map showing odour control facilities & locations of complaints (different than facility)*

b) *GIS shape files for the odour facility and complaint mapping to allow for development of composite mapping*

Action 1.3.16 – Develop and implement air emissions management programs for standby power generators at municipal sewer pump stations *(2016)*.

Narrative 13: Summarize air emissions management programs for standby power generotors at municipol sewer pump stations. If these are the same as the previous reporting period 2017-2018, then indicate "Same as the last reporting period: no changes", or if only minor changes, enter appropriate text similar to "Same as the last reporting period except for..." This action should be complete by now.

***Notes:** Metro Vancouver developed "Specifications for New Diesel Powered Vehicles & Equipment" as part of its green procurement process (details were previously shared with the REAC-LWS and are available from MV).*

Same as the last reporting period: no changes.

Action 1.3.17 – Develop and implement programs to reduce greenhouse gas emissions from municipal liquid waste management systems to help achieve federal, provincial and municipal greenhouse gas targets *(Ongoing, see Action 3.1.5)*.

Narrative 14: Summarize air emissions management programs for standby power generotors at municipal sewer pump stations. If these are the same as the previous reporting period 2017-2018, then indicate "Same as the last reporting period: no changes", or if only minor changes, enter appropriate text similar to "Same as the last reporting period except for..."

Richmond's 2041 OCP includes a target to reduce community greenhouse gas (GHG) emissions by 80 per cent by 2050. In January 2014, City Council approved Richmond's Community Energy and Emissions Plan (CEEP). City Council directed staff in 2019 to develop a plan that was consistent with the Intergovernmental Panel on Climate Change's recommendations that governments need to target zero greenhouse gas emissions by 2050. Eight Strategic Directions to shape actions in the plan were approved in 2020, related Directions include:

- **Retrofit Existing Buildings**: Accelerate deep energy retrofits to existing residential, institutional, commercial and industrial buildings and shift to low-carbon heating and cooling using in-building systems or district energy.
- **Carbon Neutral New Buildings and Energy Systems**: All new buildings will meet the top performance level of the BC Energy Step Code starting in 2025, and use low carbon energy systems (in-building or district energy).
- **Complete Communities**: Accelerate current OCP objectives for compact, complete communities throughout Richmond, with a range of services, amenities and housing choices, and sustainable mobility options within a five-minute walk of homes.

- **Enhance Green Infrastructure**: Maximize the climate benefits of Richmond's green infrastructure by improving or expanding existing carbon stores in trees, vegetation and soils.
- **Transition to a Circular Economy**: Create a circular economy in Richmond that maximizes the value of resources through smart product design, responsible consumption, minimized waste and reimagining how resources flow in a sustainable, low-carbon economy.

Richmond is continuing to work with Metro Vancouver to implement a sewer heat recovery system on the Gilbert Trunk Sewer as part of the Oval Village District Energy Utility. During the reporting period, the City's Lulu Island Energy Company Inc. (LIEC), in partnership with Corix Utilities Inc. continue to provide thermal energy services to developments with the Oval Village service area. To date, 2,651,030 ft^2 (246,289 m^2) of residential floor space is connected to the system, with an estimated 6,391,517 ft^2 (593,792 m^2) at full build out. The implementation of the sewer heat recovery energy source for this project is targeted for 2024. At full build-out, this project will result in an estimated annual reduction of 9,200 tonnes of CO2e GHG emissions.

The City has also completed a project to identify potential locations within the municipality's own sanitary sewer system for the cost-effective implementation of smaller-scale energy recovery facilities. Such "micro" sewer heat recovery plants could provide heating and/or cooling for a smaller-scale stand-alone developments, or act as an ancillary heating input to the City's large District Energy networks. The City is conducting due diligence to further assess the viability of implementing a "micro" sewer heat recovery plant at one of the locations identified from this study.

Richmond is completing the planning and due diligence process for the development of a City Centre district energy system. As part of the future system, several scenarios which utilize liquid waste as an energy source are being analyzed. These initiatives are all part of the strategy to develop low carbon district energy utility services throughout City Centre. While the City Centre DEU due diligence is progressing, the City is utilizing an opportunity to secure a customer base for the immediate implementation of GHG emissions reduction through the rezoning and/or OCP amendment application process. To date, ten development applicants comprising approximately 4.7M ft^2 have committed to construct a low carbon energy plants that will be owned and operated by LIEC.

Action 3.1.6 –	Assess the performance and condition of municipal sewerage systems by: (a) inspecting municipal sanitary sewers on a twenty year cycle, (b) maintaining current maps of sewerage inspection, condition and repairs, and (c) using the Metro Vancouver "Sewer Condition Report, November 2002" as a guide to ensure a consistent approach to sewer system evaluation and reporting *(Ongoing).*

Narrative 15: Summarize key progress on the assessment and condition of municipal sewerage system for 2019-2020. If these are no changes since the previous reporting period 2017-2018, then indicate "Same as the last reporting period: no changes".

Same as the 2017-2018 reporting period: no changes.

Attachment 5:

a) *A map showing sewerage system CCTV inspection for 2019-2020 and the other areas of CCTV inspection work in a different colour over the previous 20 years (2000-2020).*

b) *A map showing any sewer replacement /rehabilitation work for 2019-2020 as part of either asset management or capacity upgrades. Indicate whether the work is for upgrades or maintenance.*

Action 3.1.8 –	Develop and implement asset management plans targeting a 100 year replacement of rehabilitation cycle for municipal sewerage infrastructure and provide copies of such plans to Metro Vancouver *(2014).*

Narrative 16: Summarize key progress or accomplishments on the development of asset management plans for municipal sewerage infrastructure for 2019-2020.

Richmond has an ongoing Ageing Infrastructure Replacement Program with dedicated funding from the Sanitary Sewer Utility that maintains the sanitary system in an appropriate operating condition. Staff report to City Council bi-annually on the status of the program, including current infrastructure status, long-term funding requirements and funding gaps if they exist. The 2019 program update identified a long-term, sustainable capital requirement of $8.4M and a current annual budget of $5.8M. City Council and staff have made significant progress in closing the funding gap and will continue to close the gap in subsequent utility rate setting cycles. The sanitary system is relatively young and the bulk of replacement funding is predicted to be required between 2041 and 2061. As such, the incremental approach to closing the funding gap is appropriate for the City of Richmond.

Attachment 6:

a) *Titles of any completed asset [replacement] management plans (author, date, title, and publisher) for 2019-2020.*

Jason Ho, P.Eng, June 23, 2019, Ageing Utility and Road Infrastructure Planning – 2019 Update, CoR (REDMS 6483102)

Chris Chan, E.I.T., PMP, 5-Year Capital Program – Sanitary Capital Program, CoR (REDMS 6471272)

b) *Completed annual PSAP 3150 reporting on asset values for 2019-2020.*

2019 Annual Report: https://www.richmond.ca/cityhall/finance/reporting/reports.htm
More information on Richmond's non-financial assets is available at:

https://www2.gov.bc.ca/gov/content/governments/local-governments/facts-framework/statistics/statistics

c) *Colour coded map showing age of the sewerage system (i.e.: <1900, 1901-1925, 1926-1950, 1951-1975, 1976-2000, >2001) updated to show any changes made in 2019-2020. If no changes, please indicote so and the mapping prepared for the 2019-2020 reporting period will be used.*

Action 3.2.4 –	Undertake a tri-annual internal audit of best practices of one municipal liquid waste management sub-program in each municipality to identify opportunities for innovation and improvements *(Triennially).*

Narrative 17: Summarize key findings from the tri-annual internal audit (starting in 2013).

Ageing Infrastructure Planning Program

In 2019, Richmond conducted an update of the Ageing Infrastructure Planning Program, which included reconciling current inventory, reviewing the evolving theory on infrastructure service life, and updating infrastructure replacement pricing.

This audit identified the following key findings:

- Infrastructure replacement costs continue to increase due to inflation, environmental requirements and sanitary pump station complexity.
- Development facilitates significant infrastructure replacement, having a positive impact on the City's overall ageing infrastructure picture. However, development is subject to external factors, such as the economy, and does not always coincide with infrastructure that is beyond its useful life. Therefore, development is not considered a sustainable resource for ageing infrastructure replacement.
- The long-term, sustainable capital requirement is $8.4M for the sanitary utility. The current budget is $5.8M. Closing the funding gap is achievable within the next decade or sooner through the annual budgeting process.

Action 3.3.6 – In collaboration with Metro Vancouver, estimate and document the greenhouse gas emissions and odours associated with the operation of the municipal and regional liquid waste management systems *(2014)*.

Narrative 18: Summarize the estimate of greenhouse gas emissions associated with the operation of municipal and regional liquid waste management systems. Odour control and mapping are being reported under Action 1.3.15.

The estimated total emission in 2019 due to electricity use at sanitary pump stations and sanitary fleet fuel use for operational tasks is 150.5 tCO2e.

Action 3.3.7 – Estimate and report on the frequency, location and volume of sewerage overflows from municipal combined and sanitary sewers, and where feasible identify and address the probable causes *(Ongoing)*.

Narrative 19: Summarize and highlight any important details and/or action plans relating to managing wet weather SSOs, CSOs and dry & wet weather SSOs during the period 2019-2020. If no changes since 2017-2018, then indicate "Same as the last reporting period: no changes".

For each CSO location, in a table indicated estimated volumes & number of occurrences (this will have been prepared for EC WSER reporting but is also required by the LWMP).

Same as the last reporting period: no changes.

Attachment 7:

a) *Provide (if not already provided) GIS shape files which have the locations of the CSO outfalls for purposes of summary mapping (should already be reported under WSER).*

b) *Provide GIS shape files or coordinates for the locations of wet & dry weather SSOs for each year (indicate which is dry/wet and year). Include SSO dates and estimated volume.*

Action 3.3.8 – Maintain and, if necessary, expand the existing municipal sewer flow and sewer level monitoring network *(Ongoing)*.

Narrative 20: Summarize and highlight any changes to the existing municipal sewer flow & sewer level monitoring network for 2019-2020 (if no changes, then indicate "Same as the last reporting period: no changes").

Same as the last reporting period: no changes.

Attachment 8:

o) Map and GIS coordinates showing locations of active municipal sewer flow/level monitors for the reporting period 2019-2020 (indicate whether permanent or temporory)

Action 3.4.4 –	In collaboration with Metro Vancouver and the Integrated Partnership for Regional Emergency Management (IPREM), develop emergency management strategies and response plans for municipal and regional wastewater collection and treatment systems *(2015).*

Narrative 21: Summarize any work on emergency management strategies and response plans for municipal & regional wastewater collection and treatment systems in 2019-2020.

The City maintains an inventory of portable diesel standby power generators on trailers. These generators are intended to provide back-up power for sanitary and drainage pump stations in the event of emergency power failures and is the primary response plan for stations that do not have built-in generators. Built-in backup generators are incorporated into new or upgraded stations constructed within City Centre where possible.

The City is investigating resilience systems for sanitary pump stations focused on long duration energy availability comprised of onsite energy generation and storage, reducing the City's reliance on diesel generators for back-up power. This project is ongoing and currently in its planning stages.

Action 3.4.5 –	Adapt infrastructure and operations to address risks and long-term needs *(Ongoing).*

Narrative 22: Summarize any key initiatives that support the adaptation of infrastructure & operations to address risks and long term needs (e.g. climate change, sea level rise, seismic risk, demographic growth, etc...). If no change from 2017-2018, then indicate, "Same as the last reporting period: no changes".

Richmond's Flood Protection Management Strategy identifies climate change issues and provides high level guidance on the City's flood mitigation improvements. A key component of the Flood Protection Management Strategy is the Dike Master Plan, which guides the City's dike raising efforts. The plan is being completed in multiple phases, each identifying dike upgrade options and recommendations for different areas throughout the City. These recommendations address long term risks such as climate change-induced sea level rise, higher intensity storms, and spring snow melt. These risks are mitigated by the City's proactive and extensive flood protection efforts.

Action 3.4.6 –	Ensure liquid waste infrastructure and services are provided in accordance with the Regional Growth Strategy and coordinated with municipal Official Community Plans *(Ongoing).*

Attachment 9:

a) *If not already provided, provide updated GIS shape files of the municipal sanitary sewer network, including manholes, pump stations, pipe diameters for the municipal sewer system. Please indicate what changes have been made for 2019-2020.*

***NOTE:** This information is part of the routine information provided to Metro Vancouver every two yeors in response to municipal obligations under the GVS&DD Act. This information will be used to update Metro Vancouver's GIS database. If this information is open-source and already available online, please just indicate that it is available online and is open-source.*

Action 3.4.7 –	Develop and implement integrated stormwater management plans at the watershed scale that integrate with land use to manage rainwater runoff *(2014).*

Narrative 23: *Summarize and highlight key initiatives relating to the development and implementation of the integrated stormwater management plans* ***for each watershed/ISMP area.***

***NOTE:** Format and content should be similar to the reporting provided in previous Interim Reports for the Integrated Liquid Waste and Resource Management Plan. See: http://www.metrovancouver.org/services/liquid-waste/LiquidWastePublications/IntegratedLiquidWasteResourceManagementPlanInterimReport2017.pdf*

Same as the last reporting period: no changes.

Attachment 10:

a) *GIS shape files showing the ISMP boundaries and their status: Development Phose= Yellow; Implementation Phase = Light Green; Completed Phase = Dark Green. Add ISMPs still to start development as outlined only).*

***NOTE:** The ISMPs will be summarized and mapped similar to the Biennial and Interim Reports.*

Action 3.5.8 –	Biennially produce a progress report on plan implementation for distribution to the Ministry of the Environment that: (a) summarizes progress from the previous two years on plan implementation for all municipal actions, including the status of the performance measures, (b) includes summaries and budget estimates for proposed LWMP implementation programs for the subsequent two calendar years *(July 1st biennially).*

List budget estimates for the LWMP implementation programs and subsequent two years beyond biennial report (from the 5-year plan)

Table 9 Summary of LWMP Implementation Budgets and Forecasts

LWMP Implementation Action	Details/Notes	Budget			
		2019	2020	2021*	2022*
Sanitary Sewer Capital Program	Includes pump station replacement, gravity sewer and forcemain replacement, and sanitary rehabilitation works	*1.1M*	*12.9M*	*4.3M*	*5.3M*
Development Projects (Servicing Agreements)		*1.7M*	*2.4M*	*Unknown*	*Unknown*

** Subject to council approval*

Action 3.5.9 –	*This reporting is an annual requirement. In the year of the biennial report, this action is covered off by municipal reporting on 3.4.7 & 3.3.7. In other years this addressed through the Interim Report. This municipal reporting is summarized regionally by Metro Vancouver under its Action 3.5.6.*

***Note**: The Interim Report: 2019 was submitted to the Ministry of Environment in February 2019. There is nothing to add in this section.*

Ministerial Condition 2 –	Member municipalities are strongly encouraged to business case and/or implement residential water metering programs and to consider municipal rebate programs for water efficient fixtures and appliances to reduce potable water use.

Narrative 24: Discuss initiatives that evaluate/support water metering and rebate programs to water fixtures and appliances

Richmond has comprehensive water meter programs for both residential and commercial properties. All single-family, industrial, commercial, and farm properties in Richmond are metered. In 2017, Richmond completed implementation of universal water metering for all single-family properties. Multi-

family complexes can volunteer for water meters, with the City providing a maximum subsidy of $100,000 per complex. As of the end of 2020, 50% of multi-family properties are metered in Richmond.

In 2014, Richmond also introduced a pilot project for Fixed Base Meter Reading that facilitates the continuous reading of meters through radio towers. The program provides real time consumption data which allows staff to better help residents identify causes of leaks and water consumption habits. The Fixed Base Network has been deployed and the project is in the final stages of system optimization.

To complement these water meter programs, Richmond provides metered customers with free water conservation kits, which include low flow showerheads, faucet aerators, toilet fill cycle diverters, toilet leak detection tablets, and educational water conservation tools. In addition, Richmond offers a $100 rebate to residents for replacing old toilets with new low-flush toilets, and subsidized rain barrels to collect and store water for outdoor use. Richmond also partnered with BC Hydro to offer $100 rebates for high-efficiency clothes washer replacements. By the end of 2020, a total of 9,411 toilet rebates, 1,956 rain barrels, and 1,369 clothes washer rebates have been issued to Richmond residents.

Ministerial Condition 3 – Metro Vancouver, in partnership with member municipalities, is encouraged to pursue a region-wide water conservation program targeting the industrial, commercial, institutional and agricultural sectors as part of its new Drinking Water Management Plan. Remaining municipalities in the region that have not implemented metering for these sectors are encouraged to do so.

Narrative 25: Summarize whether any new municipal water metering policies or programs were introduced in 2019-2020 that address this action. If no changes, then indicate, "Same as the last reporting period: no changes".

ICI sector is fully metered, no changes.

Ministerial Condition 7 – Member municipalities will, with MV planning and coordination, and to the satisfaction of the Regional Manager, develop a coordinated program to monitor stormwater and assess and report the implementation and effectiveness of Integrated Storm Water Management Plans (ISMPs). The program will use a weight-of-evidence performance measurement approach and will report out in the Biennial Report. The Regional Manager may extend the deadline for completion of ISMP by municipalities from 2014 to 2016 if satisfied that the assessment program could result in improvement of ISMP and protect stream health.

Narrative 26: Quote relevant OCP sections addressing stormwater, stream health and their consideration of ISMPs.

Given the ISMP deadline requirement, please indicate any ISMPs in development but not completed by the end of 2020.

Richmond's Integrated Rainwater Resource Management Strategy (IRRMS) addresses Richmond's needs for water quality treatment and monitoring plan. This plan was endorsed by Richmond Council in April 2016. In 2018 and 2020, the IRRMS sampling program for water quality parameters was conducted. Nine pump stations sample locations were selected to be representative of the majority of Richmond storm water discharge flow volume.

Five samples were collected within 30 days in both the wet and dry seasons and analyzed for general water quality parameters, bacteria (fecal coliform and E.coli) nutrients (nitrate) and select metals.

Attachment 11:

o) Monitoring results per watershed (as per ISMP Monitoring and Adaptive Management Framework endorsed by the Ministry of Environment and Climate Change Strategy)

2020 Results will be available in Feb 2021.

b) A map plus the GIS shape files/coordinates showing the location of monitoring sites

Not available at this time

Ministerial Condition 9 – The ILWRMP has a goal of protecting public health and the environment. In keeping with this goal and to ensure alignment with other national, provincial and regional initiatives, Metro Vancouver and member municipalities are encouraged to: (a) Have a local land use planning consider the direction provided by the ISMPs, (b) Consider how the degree, type and location of development within a drainage can affect the long-term health of the watershed,(c) Consider how to protect the stream, including the riparian areas that exert an influence on the stream, from long-term cumulative impacts and (d) Use scenarios and forecasting to systematically consider environmental consequences/benefits of different land use approaches prior to build-out (for example, Alternative Future type approaches).

Norrative 27: Please describe any changes to how you have used proactive planning processes as listed in Ministerial Condition 9 for 2019-2020 and provide examples. If there are no changes since 2017-2018, then indicate: "Same as the last reporting period: no chonges".

The strategies identified in the IRRMS are consistent with actions identified within the City's Ecological Network Management Strategy (ENMS), adopted by Council in 2015, and submitted in the 2015-2016 reporting period. Through the ENMS the City has identified an interconnected network of natural and

semi-natural areas across Richmond's landscape to protect, connect and restore. These natural areas include green infrastructure that provides essential ecosystems services related to stormwater management. Additional Actions related to Ministerial condition 9 in this reporting period include:

- In 2020, the City hosted three collaboration "coffee" web meetings with environmental compliance regulators from the BC Ministry of Environment and Climate Change Strategy and Environment and Climate Change Canada. Regulators discussed compliance enforcement efforts and sites histories of persistent problem sites and businesses in Richmond
- In November 2019, The City organized a water-based inspection of Mitchell Island with the Coast Guard, the City's consultant KWL, Ministry of Environment and Environment Canada. The boat circumnavigated the island slowly, stopping to take samples, share site regulatory enforcement histories and take pictures of known and unknown sites of concern.
- In 2019, the City of Richmond completed an update on the City's Dangerous Goods Spill Response Plan, which identifies the risk assessment, prevention initiatives, and the preparedness, response and recovery measures in place to manage dangerous goods and pollution incidents in the City of Richmond.

Attachment 12:

a) *Map showing any 2019-2020 changes to protected riparian areas & possible stream classificotions. If no changes, then this figure is not required.*

No Changes.

Municipal Progress Summary Table

The summary table is the same format at pervious Biennial Report. The columns "Dec 31st 2018" from the previous Biennial Report plus "Additions/Changes" shauld add to equal the "Dec 2020" Total.

Table 10 Summary of Municipal Progress 2019-2020

Description	Unit	Total as of Dec 31st, 2018	Additions & Changes	Total as of Dec 31st, 2020
1. Municipal Sewer System Inventory				
a. Sanitary Gravity Sewers (*excluding private systems)	m	469,300	0	468,880*
b. Sanitary Services (Connections)	ea.	31,529	76	31,605
c. Sanitary Forcemains	m	101,200	0	101,200
2. Combined Sewer System Inventory				
a. Total Combined Sewers	m	n/a	n/a	n/a
b. Combined Services (Connections)	ea.	n/a	n/a	n/a
c. Combined Sewers Separated	m	n/a	n/a	n/a
d. Percentage of total system separated	%	n/a	n/a	n/a
3. Sanitary Sewer System Evaluation Program				
a. Sanitary Sewers Video Inspected	m	448,887	5,502	454,389
b. Percentage of Entire Municipal Sewer System Dye & Smoke Tested	%	0.7	n/a	0.7
c. Percentage of Entire Municipal Sewer System Video Inspected	%	100	0	100
d. Percentage of Entire Municipal Sewer System Structurally Rated	%	100	0	100
4. Sewer System Rehabilitation				
a. Total Length of Sewers Rehabilitated	m	2,584	0	2584
b. Total Length of Sewers Replaced/Capacity Upgraded	m	16,125	3,532	19,657
c. Total Number of Service Laterals Rehabilitated	ea.	50	4	54
d. Number of Structurally Repaired Manholes/Cleanouts	ea.	4,302	741	5043
e. Number of Cross-Connections Corrected	ea.	11	0	11
5. Sanitary Sewer Overflows				
a. Total Number of Reported Dry Weather SSOs	ea.	0	0	0

Description	Unit	Total as of Dec 31st, 2018	Additions & Changes	Total as of Dec 31st, 2020
b. Total Number of Reported Wet Weather SSOs	ea.	0	0	0
c. Number of Breakdowns from Failures	ea.	136	11	147
6. Greenhouse Gas Emissions				
a. CO_2 emission reduction from sewer system	kg CO_2	n/a	n/a	n/a
7. Summary of Costs		**2019**	**2020**	**Total**
a. Sanitary Sewer Condition Evaluation Program		0	0.15M	0.15M
b. Combined Sewer Separation Program		n/a	n/a	n/a
c. Sewer System Rehabilitation Program		0.95M	2.60M	3.55M
d. CO_2 Reduction Program		0	0	0
e. ISMP Implementation		0	0	0
f. Total Cost for the Biennial Period		0.95M*	2.75M*	3.7M*

**Cost associated with items listed under 7-a to 7-e only. Capital investments associated with other aspects of sanitary system management are not included.*

2021 Liquid Waste Management Plan Biennial Report

Reporting Period: 2019 – 2020

Municipal Submission Section

To be completed by: March 1, 2021

Questions and submittal through Metro Vancouver at
2021biennialreport@metrovancouver.org

Municipal Contact Information			
Name	**Email**	**Phone**	**Responsible For ILWMP Action #**
Jason Ho	Jho@richmond.ca	(604)-244-1281	
Peter Russell	PRussell2@Richmond.ca	(604) 276-4130	1.1.16, 1.1.21, 1.3.17, 3.3.6, 3.4.7 Ministerial Conditions (7,9)
Chris Chan	Cchan2@richmond.ca	(604)-204-8516	

List of Content

Submission Checklist

Narratives:

☒ Narrative 1: *Summarize ongaing permitting & inspection programs*

☒ Narrative 2: *Summarize approach to regulating pesticides and lawn care products*

☒ Narrative 3: *Summarize updates to outreach plans for supparting liquid waste saurce cantrol programs (e.g. starmwater, sewer use, sewer maintenance, I&I management, cross connections etc.) during the reporting period*

☒ Narrative 4: *Summarize I&I manogement plans & list key actions resulting from plans*

☒ Narrative 5: *Summarize enforcement enhancements and process efforts during reporting periad*

☒ Narrative 6: *Highlight and summorize bylaw changes relating to stormwater management*

☒ Narrative 7: *Highlight and summarize changes to utility design standards and neighbourhood design guidelines in relation to on-site rainwater management*

☒ Narrative 8: *Summarize development of municipal sanitary overflow management plans. Highlight specific examples.*

☒ Narrative 9: *Highlight & summarize progress on the preventian of CSOs and the separation af combined sewers*

☒ Narrative 10: *List approaches and strategies that address risks (ie: regular maintenance, SCADA, monitoring, protocols, identified redundoncies/contingencies)*

☒ Narrative 11: *Describe regulations and status of applications*

☒ Narrative 12: *Summarize existing municipal adour control programs and the implementotion of new programs for targeted municipal sewer facilities*

☒ Narrative 13: *Summarize air emissions management programs for standby power generators at municipal sewer pump stations*

☒ Narrative 14: *Summarize air emissions management programs for standby power generatars at municipal sewer pump statians.*

☒ Narrative 15: *Summarize key progress on the ossessment and condition of municipal sewerage system*

☒ Narrative 16: *Summarize key progress or accomplishments on the development of asset management plans for municipal sewerage infrastructure*

☒ Narrative 17: *Summarize key findings from the tri-annual internol audit*

☒ Narrative 18: *Summarize the estimate of greenhouse gas emissions and odours associated with the operation of municipal and regionol liquid waste management systems*

☒ Narrative 19: *Summorize and highlight any important details and action plans relating to wet weather SSOs & probably causes of CSOs*

☒ Narrative 20: *Summarize and highlight any changes to the existing municipal sewer flow & sewer level monitoring network*

☒ Narrative 21: *Summarize progress on the development of emergency management strategies and response plans for municipal & regional wostewater collection and treatment systems*

☒ Narrative 22: *Summarize key initiatives thot support the adaptation of infrastructure & operations to address risks and long term needs*

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☒ Narrative 24: *Discuss water metering & rebate programs relating to water fixtures and appliances*

☒ Narrative 25: *Summarize whether any new municipal water metering policies or programs were introduced in the last report that address this action. If no changes, then indicate, "Same as the 2017-2018 reporting period: no changes".*

☒ Narrative 26: *Quote relevant OCP sections addressing stormwater, stream health and their consideration of ISMPs*

☒ Narrative 27: *Describe any changes to proactive planning processes as listed in Ministeriol Condition 9 for 2019-2020 and pravide examples.*

Tables:

Graphics & GIS Data:

☒ Attachment 1:

- I&I Mapping showing I&I rates for neighbourhoods where studies have been completed with before and after I&I (L/ha·d). Objectives to Illustrates catchment areas covered by I&I studies.
- Transmit an electronic copy of GIS shape files for study catchment boundaries to Metro Vancouver

☐ Attachment 2:

- Mapping showing where sewer separation work occurred in 2019-2020
- GIS shape files of the locations where sewer separation occurred in 2019-2020 for composite mapping
- GIS shape files of catchments of remaining combined sewer catchments as of December 31, 2020 (if separated catchments discharge to combined sewers, code the separated catchments as "separated").

☐ Attachment 3:

- Map and GIS data showing location of emergency municipal overflows (this information should have already been provided through a separate request through the REAC LWSC as well as the last reporting period. If already provided, please indicated so.

☒ Attachment 4:

- 2019-2020 map showing odour control facilities & locations of complaints (different than facility)
- GIS shape files for the odour facility and complaint mapping to allow for development of composite mapping

☒ Attachment 5:

- A map showing sewerage system CCTV inspection for 2019-2020 and the other areas of CCTV inspection work in a different colour over the previous 20 years (2000-2020).
- A map showing any sewer replacement /rehabilitation work for 2019-2020 as part of either asset management or capacity upgrades. Indicate whether the work is for upgrades or maintenance.

☒ Attachment 6:

- Titles of any completed asset [replacement] management plans (author, date, title, and publisher) for 2019-2020.
- Completed annual PSAP 3150 reporting on asset values for 2019-2020.
- Colour coded map showing age of the sewerage system (i.e.: <1900, 1901-1925, 1926-1950, 1951-1975, 1976-2000, >2001) updated to show any changes made in 2019-2020. If no changes, please indicate so and the mapping prepared for the 2017-2018 reporting period can be used.

☐ Attachment 7:

- Provide (if not already provided) GIS shape files which have the locations of the CSO outfalls for purposes of summary mapping (should already be reported under WSER).
- Provide GIS shape files or coordinates for the locations of wet & dry weather SSOs for each year (indicate which is dry/wet and year). Include SSO dates and estimated volume

☒ Attachment 8:

- Map and GIS coordinates showing locations of active municipal sewer flow/level monitors for the reporting period 2019-2020 (indicate whether permanent or temporary)

☐ Attachment 9:

- If not already provided, provide updated GIS shape files of the municipal sanitary sewer network, including manholes, pump stations, pipe diameters for the municipal sewer system as of the end of 2020. Please indicate what changes have been made for 2019-2020.

☒ Attachment 10:

- GIS shape files showing the ISMP boundaries and their status: Development Phase= Yellow; Implementation Phase = Light Green; Completed Phase = Dark Green. Add ISMPs still to start development as outlined only).

☐ Attachment 11:

- If initiated, results per watershed (as per ISMP Adaptive Management Framework)
- If undertaken, a map plus GIS shape files/coordinates showing location of monitoring.

☐ Attachment 12:

- Map showing any 2019-2020 changes to protected riparian areas & possible stream classifications. If no changes, then this figure is not required.

City of Richmond

Action 1.1.14 – Review and enhance sewer use bylaws to reduce liquid waste at source, including contaminants identified by the *Canadian Environmental Protection Act (2012).*

Table 1 Core Sewer Use Bylaws

Sewer Use Bylaws*	2019-2020 Changes**
Drainage, Dyke and Sanitary Sewer System Bylaw No. 7551	No changes
Public Health Protection Bylaw No. 6989	No changes
Pollution Prevention and Clean-Up Bylaw No. 8475	No changes

**Re-list existing core sewer use bylaws and list all new bylaws*
***Summarize any changes (if no changes, enter "No changes")*

Table 2 Summarize Status of Bylaws Related to Controlling Sediment Transport & Erosion

Name of Bylaw* (related to controlling sediment release from land clearing and construction phase of development)	
Drainage, Dyke and Sanitary Sewer System Bylaw No. 7551 – requires that connections to the City's drainage system are disconnected and capped prior to demolition of buildings to prevent sediment entering the drainage system. ***Pollution Prevention and Clean-Up Bylaw No. 8475*** – prohibits the release of polluting substance into the receiving environment, and requires that no discharge from dewatering may enter the City's drainage system or watercourse without a Permit with the City. Such Permits require a Qualified Environmental Professional (QEP) to provide a Water Quality Monitoring Response Plan and a signed and sealed QEP declaration confirming the discharge water will meet minimum standards of the City, and will not cause harm to the receiving water body. ***Boulevard and Roadway Protection and Regulation Bylaw No. 6366*** – requires that anyone using a boulevard for construction to ensure that the roadway is cleared of sediment producing material during the activity. ***Boulevard Maintenance Bylaw No. 7174*** – Requires that a property owner not discard any materials fronting their property. ***Watercourse Protection and Crossing Bylaw No. 8441*** – limits the obstruction of flow, and requires that watercourse crossing design, construction and maintenance are approved by the City so as to protect water quality and the functioning of the City's drainage system or any City land. ***City of Richmond Engineering Design Specifications*** – requires that catch basins and inspection chambers be installed on all drainage service pipes to prevent sediment discharging into the City's drainage system. It also requires that a Sediment Control Plan be submitted to the City to identify the type and location of sediment control best management practices that will be used during construction.	
Bylaw Details	**2019-2020 Changes***
Summarize monitoring requirements	No changes
How data is assessed under the bylaw?	No changes
How is assessment used to initiate corrective actions?	No changes

Summarize approaches used to maintain compliance with the bylaw (e.g. annual resources dedicated to maintaining compliance).	No changes
Discuss effectiveness of bylaw/bylaws and current approach to prevent inputs of sediment to the storm system and receiving environment.	No changes

**For new or changed bylaws since 2017-2018, summarize ony changes in 2019-2020 (if no changes in a section, enter "No chonges").*

Action 1.1.15* – Continue existing programs of permitting and inspection to support and enforce sewer use bylaws (*Ongoing, *City of Vancouver Only*).

Narrative 1: Summarize ongoing permitting & inspection programs

Insert Narrative Text Here

Table 3 Types and Number of Liquid Waste Related Permits Issued 2019-2020

Permit Type/Name*	Number of Permits*	Referenced Bylaw*

**City of Vancouver Only*

Action 1.1.16 – Identify and regulate pesticides and lawn care products which negatively affect rainwater runoff quality and urban stream health *(2014)*.

Narrative 2: Summarize approach to regulating pesticides & lawn care products for 2019-2020.

Adopted in 2009, Richmond's Enhanced Pesticide Management Program (EPMP) reduces the exposure of Richmond residents to unnecessary pesticide use. The program includes a regulation restricting the use of pesticides for cosmetic purpose, as well as resources to empower community members to make the switch to pesticide-free practices. In December of 2015, the City adopted the Invasive Species Action Plan (ISAP), intended to build upon the accomplishments of the EPMP. ISAP includes strategies to reduce the economic and environmental risks of invasive species management by implementing monitoring and control procedures and increasing awareness of invasive species within the community. ISAP delivers the City's early detection and rapid response program for public and private lands in order to ensure that pesticides and lawn-care products are deployed minimally and in a highly controlled fashion.

The City's Pesticide Use Control Bylaw No. 8514 restricts the cosmetic use of pesticides on residential and municipally-owned lands. In addition to bylaw enforcement, the City provides an expanded

Education and Community Partnerships Program to inform the community about pesticide restrictions and to promote natural gardening and pest solutions. This includes a series of annual natural gardening workshops, a phone line to help residents learn proper plant care and sustainable pest solutions, and information sheets available through the City's website.

Table 4 Products Regulated to Protect Stormwater Runoff Quality

Regulated Products	**Type of Regulation** *(Sales Ban, Use Ban, Permit, Limited Users, etc.)*	**Additional Information** *(Referenced Bylaw & Policy Numbers)*
Pesticides	Limited users	Pesticide Use Control Bylaw No. 8514 – Amendment Bylaw 9574.

Action 1.1.17 – Continue outreach plans to support liquid waste source control programs *(Ongoing).*

Narrative 3: Summarize 2019-2020 updates to outreach plans for supporting liquid waste source control programs (e.g. stormwater, sewer use, sewer maintenance, I&I management, crass connections etc.).

Green Cart Program

Richmond residents have access to food scraps recycling services with the Green Cart Program since 2013. The Green Cart Program reduces the amount of waste that would otherwise be discharged to the sanitary sewer through garburators. Through the Green Cart program, 45,000 tonnes of food scraps and yard trimmings were collected. To facilitate grease reduction in the sanitary system, Richmond conducts the following activities:

- Provide Green Cart Program literature, which includes information on the impact of grease on the sewer system as well as proper grease disposal techniques, noting that small amounts of grease and oil that can be absorbed by newspaper or paper towel should be recycled in the Green Cart.
- Cooking oil and animal fat continue to be accepted at the City's Recycling Depot.
- Promote proper disposal of cooking oil and grease through the annual collection calendar/recycling guide, Green Cart brochure, Annual Report, City website, social media and community outreach which includes recycling workshops , booths at community events and recycling information sessions in multi-family buildings.
- Discourage the use of garburators as part of the Green Cart Program.

- Carry out the Green Cart and Recycling Depot programs, which allow residents to recycle food scraps and solid grease. Signage at the depot for oil and grease recycling simplifies the drop off process for residents.

Metro Vancouver Waste Water Discharge Permit Process

The City continues to participate in the Metro Vancouver sanitary sewer source control program by supporting the Metro Vancouver Waste Water Discharge Permit process.

Fat, Oil and Grease Reduction Programs

The City maintains a Grease Management Program which includes grease source control, sanitary sewer system monitoring and inspection, an on-going maintenance work. Bylaw enforcement staff continued to work with representatives from Metro Vancouver, stakeholder groups, industry associations, pumping operators and grease trap vendors to mitigate the impact of fats, oils and grease on the region's sanitary sewer system.

In 2019, a dynamic FOG map was developed linking FOG condition inspections of mains and access chambers to identify areas of concern. The FOG mapping will inform effective allocation of source identification, awareness education, bylaw enforcement, and condition based maintenance resources.

Rainwater Best Management Practices

Richmond's Official Community Plan Bylaw No. 9000 – Schedule 1, Section 14.2.10, Development Permit Guidelines – Green Buildings and Sustainable Infrastructure, provides general direction in regards to the voluntary undertaking, where feasible, of green building and sustainable infrastructure to support City of Richmond sustainability objectives and help reduce the demand for energy and resources. Developers are encouraged to incorporate green roofs, bio-swales, infiltration and other best management practices throughout the building site to store rainwater, mitigate urban heat island effect, reduce heating and cooling loads and reduce the impact on City drainage systems.

Richmond's Integrated Rainwater Resource Management Strategy contains initiatives to strategically implement stormwater detention and rainwater re-use measures and encourage stormwater detention on private properties in order to reduce stormwater runoff. In addition, the strategy works to strengthen erosion and sediment control and encourage water quality improvements.

Richmond's Ecological Network Management Strategy (ENMS) was adopted in 2015 and provides the ecological blueprint for the City to protect, connect and enhance the natural and green spaces throughout Richmond and beyond. It is an opportunistic approach for managing and guiding decisions regarding the city-wide system of natural areas and the ecosystem services they provide. It is designed to complement existing development processes and regulations in order to integrate ecological connectivity and health into all neighbourhoods and land-uses. The ENMS contains extensive actions and initiatives on the integration of rainwater management Best Management Practices tailored to various land uses within the city. These include green infrastructure (e.g. rain gardens, swales,

harvesting) development in parks and through planning processes, riparian corridor enhancements, and the review and update of bylaws.

Mitchell Island Environmental Stewardship Initiative

Council endorsed the Mitchel Island Stewardship Initiative in 2019 to promote stewardship and improve the Island's stormwater quality under the Bylaw No. 8475. As part of this initiative, the City of Richmond received a Federation of Canadian Municipalities Green Municipal Fund Grant in 2020 to improve stormwater quality on Mitchell Island. Mitchell Island is an important industrial hub within the City of Richmond that is connected to the ecologically sensitive Fraser River through the City's drainage infrastructure. Persistent environmental concerns have been noted in the area and, in response, Richmond has implemented a program to promote environmental stewardship among local business owners, to assess and monitor the health of the island environment, and to improve collaboration between staff and senior governments. The program has generated new levels of cooperation amongst stakeholders on Mitchell Island, and identified and mitigated numerous sources of Fraser River water contamination with a comprehensive stormwater sampling component. Many businesses, once made aware of their impacts, have been quick to install pollution mitigation infrastructure such as settling ponds, pH correcting technologies, impervious surfaces, and wheel washes, resulting in measurable improvements to island storm discharge water quality.

Rain Barrel Program

The City offers rain barrels to Richmond residents at subsidized prices.

Low-Flow Toilet Rebate Program

The City offers a $100 rebate to residents for replacing old toilets with new low-flush toilets to reduce waste volume through water conservation.

High-Efficiency Clothes Washer Rebate Program

The City partnered with BC Hydro to offer a maximum $100 rebate to residents for replacing old clothes washers with new energy- and water- efficient models, in order to reduce GHGs through energy conservation as well as waste volume through water conservation.

Water Meter Programs

The City maintains an advanced water metering program to encourage water conservation. All commercial and industrial water use is metered. The Universal Water Metering program for all single-family properties was completed by the end of 2017. The City continues to maintain a volunteer water metering program for multi-family properties that includes mandatory metering of new multi-family complexes, subsidizing installation costs for existing multi-family complexes (up to the greater of $1,200 per unit or $100,000 per complex for the actual installation cost), and a five-year guarantee that allows residents to adjust water use habits without financial risk. Currently 50% of the multi-family units in

Richmond have been metered for water and approximately 96% of metered multi-family complexes saved money compared to the flat rate.

Water metering provides customers increased rate equity compared to the flat rate and a tool to manage their costs while consumption monitoring allows staff to identify leaks and system inefficiencies to minimize wastage. Since 2003, the City has managed to reduce total water consumption despite a 25% population increase. By reducing water consumption, the City achieved a cost reduction of over $10M in Metro Vancouver water purchase costs in 2019 alone. This is a strong indication that water conservation efforts to date are have been effective in reducing water use and sewerage discharge correspondingly to minimize capital replacement needs.

The City continues to leverage its water meter infrastructure to further enhance customer service and water conservation strategies through a fixed based network. This advanced metering infrastructure provides staff with real-time consumption data that can help customers identify leaks, inform water consumption habits, and enhance revenue forecasting.

Action 1.1.18 – Develop and implement inflow and infiltration management plans, using the Metro Vancouver template as a guide, to ensure wet weather inflow and infiltration volumes are within Metro Vancouver's allowances as measured at Metro Vancouver's flow metering stations *(2012)*.

Narrative 4: Summarize I&I management plans & list key actions resulting from plans in 2019-2020. If no work was initiated or undertaken for 2019-2020, then indicate "Same as the last reporting period: no changes".

Richmond monitors I&I at the catchment level through pump runtimes at sanitary pump stations. Automated pump runtime data collection has been set up through the SCADA network and detailed pump runtimes are captured in data loggers that are manually downloaded to spreadsheets and subsequently converted to sanitary flow rates.

Richmond has installed pressure sensors at sanitary pump stations and continues to install magnetic flow meters at new sanitary pump stations. The City is assessing automated pump station data analysis tools to help determine catchments with excessive I&I for further study. Additional rainfall sensors have been installed to more accurately identify the sanitary system response to rainfall events. This study will include a review of sanitary system response to rainfall events.

Richmond began CCTV inspections of its gravity sanitary sewers in 2002. By 2015, CCTV inspections have been completed for 100% of Richmond's gravity sewers. A dynamic GIS layer was introduced in 2018 linking CCTV inspection videos to the asset management system enhancing access and documentation of inspection results and asset condition assessments. The CCTV inspection layer will be leveraged for the next cycle of sanitary sewer CCTV inspections.

Attachment 1:

a) I&I Mapping showing I&I rates for neighbourhoods where studies have been completed with before and ofter I&I (L/ha·d). Objectives to Illustrates catchment areas covered by I&I studies.

b) Transmit an electronic copy of GIS shape files for study catchment boundaries to Metro Vancouver.

Action 1.1.19 – Enhance enforcement of sewer use bylaw prohibition against the unauthorized discharge of rainwater and groundwater to sanitary sewers *(2010)*.

Narrative 5: Summarize enforcement enhancements and process effort changes during 2019-2020. If no changes, then enter "Same as the lost reporting period: no changes".

Same as the last reporting period: no changes.

Table 5 Bylaws Regulating Discharges of Groundwater and Rainwater to Sanitary Sewers

Regulation or Bylaw No.	Date	Summary of Any Changes 2019-2020*
Drainage, Dyke and Sanitary Sewer System Bylaw No. 7551	Effective Date – January 1, 2003	No changes
Pollution Prevention and Clean-Up Bylaw No. 8475	Effective Date- October 13, 2009	No changes

**if no changes, enter "no changes" in table.*

Action 1.1.20 – Update municipal bylaws to require on-site rainwater management sufficient to meet criteria established in municipal integrated stormwater plans or baseline region-wide criteria *(2014)*.

Narrative 6: Highlight and summarize any bylaw changes or development effort relating to stormwater management for 2019-2020. If no changes, indicate "Same as the last reporting period: no changes".

The region wide baseline has been approved by the Board for use by Municipalities and ISMP's should be in implementation phase. Please list below the bylaws requiring on-site stormwater management per this action.

Same as the last reporting period: no changes.

Table 6 Bylaws Related to On-site Stormwater Management

Related Stormwater Bylaws	Changes to On-Site Stormwater Management Target/Objectives (2019-2020)*
Green Roofs & Other Options Involving Industrial & Office Buildings Outside the City Centre Bylaw No. 8385	No changes
Official Community Plan Bylaw No. 9000	No changes regarding on-site stormwater management
Pollution Prevention and Clean-Up Bylaw No. 8475	No changes

**if no changes, enter "no changes" in the table.*

Action 1.1.21 – Update municipal utility design standards and neighbourhood design guidelines to enable and encourage on-site rainwater management *(2014)*.

Narrative 7: Highlight and summarize changes for 2019-2020 to utility design standards and neighbourhood design guidelines in relation to on-site rainwater management. If no changes were made or processes initiated, then indicate "Same as the 2017-2018 reporting period: no changes".

Mitchell Island Environmental Stewardship Initiative

In November 2020, the City of Richmond received a federation of Canadian Municipalities Green Municipal Fund Grant to improve stormwater quality on Mitchell Island. Mitchell Island is an important industrial hub within the City of Richmond that is connected to the ecologically sensitive Fraser River through the City's drainage infrastructure. Persistent environmental concerns have been noted in the area and, in response, Richmond has implemented a program to promote environmental stewardship among local business owners, to assess and monitor the health of the island environment, and to improve collaboration between staff and senior governments. The program has generated new levels of cooperation amongst stakeholders on Mitchell Island, and identified and mitigated numerous sources of Fraser River water contamination with a comprehensive stormwater sampling component. Many businesses, once made aware of their impacts, have been quick to install pollution mitigation infrastructure such as settling ponds, pH correcting technologies, impervious surfaces, and wheel washes, resulting in measurable improvements to island storm discharge water quality.

Table 7 Municipal Standards, Guidelines and Policy Changes Related to On-site Stormwater Management

Name of Standard, Guideline or Policy	Changes for 2019-2020
City of Richmond Engineering Design Specifications	No changes with respect to rainwater management.
City of Richmond Integrated Rainwater Resource Management Strategy	No changes with respect to rainwater management.
City of Richmond Ecological Network Management Strategy	No changes with respect to rainwater management.

Mitchell Island Environmental Stewardship Initiative Update	Endorsed by Council

**Summarize any changes from the last report (if no changes, enter "No changes"). Otherwise, briefly summarize if a new bylaw.*

Action 1.2.5 –	Work with Metro Vancouver to develop and implement municipal-regional sanitary overflow management plans as set out in 1.2.4 *(2013)*.

Narrative 8: Summarize development of any municipal sanitary overflow management plans for 2019-2020. Highlight any specific examples. If no new plans developed, then indicate "Same as the last reporting period: no changes".

Same as the last reporting period: no changes.

Action 1.2.6 –	Burnaby, New Westminster and Vancouver will work with Metro Vancouver to give effect to 1.2.2 and, specifically, implement plans to prevent combined sewer overflows by 2050 for the Vancouver Sewerage Area and 2075 for the Fraser Sewerage Area and separate combined sewers at an average rate of 1% and 1.5% of the system per year in the Vancouver Sewerage Area and Fraser Sewerage Area respectively *(Ongoing)*.

Narrative 9: Highlight and summarize progress on the prevention of CSOs and the separation of combined sewers for 2019-2020.

Not applicable as there are no combined sewers in Richmond.

Attachment 2:

a) *Mapping showing where sewer separation work occurred in 2019-2020*

b) *GIS shape files of the locations where sewer separation occurred in 2019-2020 for composite mapping*

c) *GIS shape files of catchments of remaining combined sewer catchments as of December 31, 2020 (if separated catchments discharge to combined sewers, code the separated catchments as "separated").*

N/A

Action 1.3.11 – Develop and implement operational plans for municipal sewerage facilities to ensure infrastructure reliability and optimal performance *(Ongoing).*

Narrative 10: Discuss approaches and strategies applied in 2019-2020 that address risks (i.e. regular maintenance, SCADA, monitoring, protocols, identified redundancies/contingencies). If these are the same as the previous reporting period, then indicate "no changes", or if only minor changes, enter appropriate text similar to "Same as the last reporting period except for..."

Same as the last reporting period: no changes. **Action 1.3.12** – Work with Metro Vancouver to develop and implement emergency sanitary sewer overflow plans including contingency plans to minimize impacts of unavoidable sanitary sewer overflows resulting from extreme weather, system failures or unusual events *(Ongoing).*

Narrative 8: Identify any emergency procedures & protocols developed for 2019-2020. If these are the same as the previous reporting period, then indicate "Same as the last reporting period: no changes", or if only minor changes, enter appropriate text similar to "Same as the last reporting period except for..."

Richmond's municipal sanitary system did not experience any sanitary sewer overflows during the reporting period. Richmond does not have any combined sewer systems. Richmond does not have chronic sanitary sewer overflow issues due to weather or rainfall. There have been no changes to the emergency management plan, procedures, and protocols outlined for the 2017-2018 reporting period.

Attachment 3:

Map and GIS data showing location of emergency municipal overflows (unless there are updates, this information should have already been provided through a separate request through the REAC LWSC as well as in the 2017-2018 reporting). If already provided, please indicated so.

Action 1.3.13 – Work with private marina operators, Ministry of Environment and Environment Canada to develop and implement regulations to ensure all new marinas and marinas where planned renovations exceed 50% of the assessed existing improvements value have pleasure craft pump-out facilities *(Ongoing).*

Table 8 Bylaws and Regulations Requiring Pleasure Craft Pump-out Facilities at Marinas

Regulation Process or Bylaw*	Date*
Public Health Protection Bylaw No. 6989,	Effective Date –

Subdivision Two – Marina Health and Safety Regulation	March 13, 2000

** If these are the same as the previous reporting period 2017-2018, then indicate "Same as the last reporting period: no changes".*

Action 1.3.14 – Require all pleasure craft pump-out facilities to connect to a municipal sanitary sewerage system or a provincially permitted on-site treatment and disposal system or have established enforceable protocols for transporting liquid waste for disposal at a permitted liquid waste management facility *(Ongoing).*

Narrative 11: Describe any additional regulations and the number of on-site treatment systems required/installed during the reporting period 2019-2020. If these are the same as the previous reporting period 2017-2018, then indicate "Same as the last reporting period: no changes".

Same as the last reporting period: no changes.

Action 1.3.15 – Continue existing municipal odour control programs and implement new programs for targeted municipal sewer facilities *(Ongoing, see Action 3.3.4).*

Narrative 12: Summarize existing municipal odour control programs and the implementation of new programs for targeted municipal sewer facilities for the reporting period 2019-2020. If these are the same as the previous reporting period 2017-2018 then indicate "Same as the 2017-2018 reporting period: no changes", or if only minor changes, enter appropriate text similar to "Same as the 2017-2018 reporting period except for..."

Same as the 2017-2018 reporting period: no changes.

Attachment 4:

a) 2019-2020 map showing odour control facilities & locations of complaints (different than facility)

b) GIS shape files for the odour facility and complaint mapping to allow for development of composite mapping

Action 1.3.16 – Develop and implement air emissions management programs for standby power generators at municipal sewer pump stations *(2016)*.

Narrative 13: Summarize air emissions management programs for standby power generators at municipal sewer pump stations. If these are the same as the previous reporting period 2017-2018, then indicate "Same as the last reporting period: no changes", or if only minor changes, enter appropriate text similar to "Same as the last reporting period except for..." This action should be complete by now.

***Notes:** Metro Vancouver developed "Specifications for New Diesel Powered Vehicles & Equipment" as part of its green procurement process (details were previously shared with the REAC-LWS and are available from MV).*

Same as the last reporting period: no changes.

Action 1.3.17 – Develop and implement programs to reduce greenhouse gas emissions from municipal liquid waste management systems to help achieve federal, provincial and municipal greenhouse gas targets *(Ongoing, see Action 3.1.5)*.

Narrative 14: Summarize air emissions management programs for standby power generators at municipal sewer pump stations. If these are the same as the previous reporting period 2017-2018, then indicate "Same as the last reporting period: no changes", or if only minor changes, enter appropriate text similar to "Same as the last reporting period except for..."

Richmond's 2041 OCP includes a target to reduce community greenhouse gas (GHG) emissions by 80 per cent by 2050. In January 2014, City Council approved Richmond's Community Energy and Emissions Plan (CEEP). City Council directed staff in 2019 to develop a plan that was consistent with the Intergovernmental Panel on Climate Change's recommendations that governments need to target zero greenhouse gas emissions by 2050. Eight Strategic Directions to shape actions in the plan were approved in 2020, related Directions include:

- **Retrofit Existing Buildings**: Accelerate deep energy retrofits to existing residential, institutional, commercial and industrial buildings and shift to low-carbon heating and cooling using in-building systems or district energy.
- **Carbon Neutral New Buildings and Energy Systems**: All new buildings will meet the top performance level of the BC Energy Step Code starting in 2025, and use low carbon energy systems (in-building or district energy).
- **Complete Communities**: Accelerate current OCP objectives for compact, complete communities throughout Richmond, with a range of services, amenities and housing choices, and sustainable mobility options within a five-minute walk of homes.

- **Enhance Green Infrastructure**: Maximize the climate benefits of Richmond's green infrastructure by improving or expanding existing carbon stores in trees, vegetation and soils.
- **Transition to a Circular Economy**: Create a circular economy in Richmond that maximizes the value of resources through smart product design, responsible consumption, minimized waste and reimagining how resources flow in a sustainable, low-carbon economy.

Richmond is continuing to work with Metro Vancouver to implement a sewer heat recovery system on the Gilbert Trunk Sewer as part of the Oval Village District Energy Utility. During the reporting period, the City's Lulu Island Energy Company Inc. (LIEC), in partnership with Corix Utilities Inc. continue to provide thermal energy services to developments with the Oval Village service area. To date, 2,651,030 ft^2 (246,289 m^2) of residential floor space is connected to the system, with an estimated 6,391,517 ft^2 (593,792 m^2) at full build out. The implementation of the sewer heat recovery energy source for this project is targeted for 2024. At full build-out, this project will result in an estimated annual reduction of 9,200 tonnes of CO2e GHG emissions.

The City has also completed a project to identify potential locations within the municipality's own sanitary sewer system for the cost-effective implementation of smaller-scale energy recovery facilities. Such "micro" sewer heat recovery plants could provide heating and/or cooling for a smaller-scale stand-alone developments, or act as an ancillary heating input to the City's large District Energy networks. The City is conducting due diligence to further assess the viability of implementing a "micro" sewer heat recovery plant at one of the locations identified from this study.

Richmond is completing the planning and due diligence process for the development of a City Centre district energy system. As part of the future system, several scenarios which utilize liquid waste as an energy source are being analyzed. These initiatives are all part of the strategy to develop low carbon district energy utility services throughout City Centre. While the City Centre DEU due diligence is progressing, the City is utilizing an opportunity to secure a customer base for the immediate implementation of GHG emissions reduction through the rezoning and/or OCP amendment application process. To date, ten development applicants comprising approximately 4.7M ft^2 have committed to construct a low carbon energy plants that will be owned and operated by LIEC.

Action 3.1.6 –	Assess the performance and condition of municipal sewerage systems by: (a) inspecting municipal sanitary sewers on a twenty year cycle, (b) maintaining current maps of sewerage inspection, condition and repairs, and (c) using the Metro Vancouver "Sewer Condition Report, November 2002" as a guide to ensure a consistent approach to sewer system evaluation and reporting *(Ongoing)*.

Narrative 15: Summarize key progress on the assessment and condition of municipal sewerage system for 2019-2020. If these are no changes since the previous reporting period 2017-2018, then indicate "Same as the last reporting period: no changes".

Same as the 2017-2018 reporting period: no changes.

Attachment 5:

a) *A map showing sewerage system CCTV inspection for 2019-2020 and the other areas of CCTV inspection work in a different colour over the previous 20 years (2000-2020).*

b) *A map showing any sewer replacement /rehabilitation work for 2019-2020 as part of either osset management or capacity upgrades. Indicate whether the work is for upgrades or maintenance.*

Action 3.1.8 –	Develop and implement asset management plans targeting a 100 year replacement of rehabilitation cycle for municipal sewerage infrastructure and provide copies of such plans to Metro Vancouver *(2014).*

Narrative 16: Summarize key progress or accamplishments on the development of asset management plans for municipal sewerage infrastructure for 2019-2020.

Richmond has an ongoing Ageing Infrastructure Replacement Program with dedicated funding from the Sanitary Sewer Utility that maintains the sanitary system in an appropriate operating condition. Staff report to City Council bi-annually on the status of the program, including current infrastructure status, long-term funding requirements and funding gaps if they exist. The 2019 program update identified a long-term, sustainable capital requirement of $8.4M and a current annual budget of $5.8M. City Council and staff have made significant progress in closing the funding gap and will continue to close the gap in subsequent utility rate setting cycles. The sanitary system is relatively young and the bulk of replacement funding is predicted to be required between 2041 and 2061. As such, the incremental approach to closing the funding gap is appropriate for the City of Richmond.

Attachment 6:

a) *Titles of any completed asset [replacement] management plans (author, date, title, and publisher) for 2019-2020.*

Jason Ho, P.Eng, June 23, 2019, Ageing Utility and Road Infrastructure Planning – 2019 Update, CoR (REDMS 6483102)

Chris Chan, E.I.T., PMP, 5-Year Capital Program – Sanitary Capital Program, CoR (REDMS 6471272)

b) *Completed annual PSAP 3150 reporting on asset values for 2019-2020.*

2019 Annual Report: https://www.richmond.ca/cityhall/finance/reporting/reports.htm
More information on Richmond's non-financial assets is available at:

https://www2.gov.bc.ca/gov/content/governments/local-governments/facts-framework/statistics/statistics

c) *Colour coded map showing age of the sewerage system (i.e.: <1900, 1901-1925, 1926-1950, 1951-1975, 1976-2000, >2001) updated to show any changes made in 2019-2020. If no changes, please indicate so and the mapping prepared for the 2019-2020 reporting period will be used.*

Action 3.2.4 –	Undertake a tri-annual internal audit of best practices of one municipal liquid waste management sub-program in each municipality to identify opportunities for innovation and improvements *(Triennially).*

Narrative 17: Summarize key findings from the tri-annual internal audit (starting in 2013).

Ageing Infrastructure Planning Program

In 2019, Richmond conducted an update of the Ageing Infrastructure Planning Program, which included reconciling current inventory, reviewing the evolving theory on infrastructure service life, and updating infrastructure replacement pricing.

This audit identified the following key findings:

- Infrastructure replacement costs continue to increase due to inflation, environmental requirements and sanitary pump station complexity.
- Development facilitates significant infrastructure replacement, having a positive impact on the City's overall ageing infrastructure picture. However, development is subject to external factors, such as the economy, and does not always coincide with infrastructure that is beyond its useful life. Therefore, development is not considered a sustainable resource for ageing infrastructure replacement.
- The long-term, sustainable capital requirement is $8.4M for the sanitary utility. The current budget is $5.8M. Closing the funding gap is achievable within the next decade or sooner through the annual budgeting process.

Action 3.3.6 – In collaboration with Metro Vancouver, estimate and document the greenhouse gas emissions and odours associated with the operation of the municipal and regional liquid waste management systems *(2014)*.

Narrative 18: Summarize the estimate of greenhouse gas emissions associated with the operation of municipal and regional liquid waste management systems. Odour control and mapping are being reported under Action 1.3.15.

The estimated total emission in 2019 due to electricity use at sanitary pump stations and sanitary fleet fuel use for operational tasks is 150.5 tCO2e.

Action 3.3.7 – Estimate and report on the frequency, location and volume of sewerage overflows from municipal combined and sanitary sewers, and where feasible identify and address the probable causes *(Ongoing)*.

Narrative 19: Summarize and highlight any important details and/or action plans relating to managing wet weather SSOs, CSOs and dry & wet weather SSOs during the period 2019-2020. If no changes since 2017-2018, then indicate "Same as the last reporting period: no changes".

For each CSO location, in a table indicated estimated volumes & number of occurrences (this will have been prepared for EC WSER reporting but is also required by the LWMP).

Same as the last reporting period: no changes.

Attachment 7:

a) *Provide (if not already provided) GIS shape files which have the locations of the CSO outfalls for purposes of summary mapping (should already be reported under WSER).*

b) *Provide GIS shape files or coordinates for the locations of wet & dry weather SSOs for each year (indicate which is dry/wet and year). Include SSO dates and estimated volume.*

Action 3.3.8 – Maintain and, if necessary, expand the existing municipal sewer flow and sewer level monitoring network *(Ongoing)*.

Narrative 20: Summarize and highlight any changes to the existing municipal sewer flow & sewer level monitoring network for 2019-2020 (if no changes, then indicate "Same as the last reporting period: no changes").

Same as the last reporting period: no changes.

Attachment 8:

a) Map and GIS coordinates showing locotions of active municipal sewer flow/level monitors for the reporting period 2019-2020 (indicate whether permanent or temporary)

Action 3.4.4 – In collaboration with Metro Vancouver and the Integrated Partnership for Regional Emergency Management (IPREM), develop emergency management strategies and response plans for municipal and regional wastewater collection and treatment systems *(2015).*

Narrative 21: Summarize any work on emergency management strategies and response plans for municipal & regional wastewater collection and treatment systems in 2019-2020.

The City maintains an inventory of portable diesel standby power generators on trailers. These generators are intended to provide back-up power for sanitary and drainage pump stations in the event of emergency power failures and is the primary response plan for stations that do not have built-in generators. Built-in backup generators are incorporated into new or upgraded stations constructed within City Centre where possible.

The City is investigating resilience systems for sanitary pump stations focused on long duration energy availability comprised of onsite energy generation and storage, reducing the City's reliance on diesel generators for back-up power. This project is ongoing and currently in its planning stages.

Action 3.4.5 – Adapt infrastructure and operations to address risks and long-term needs *(Ongoing).*

Narrotive 22: Summarize any key initiatives that support the adoptation of infrastructure & operations to address risks and long term needs (e.g. climate change, sea level rise, seismic risk, demographic growth, etc...). If no change from 2017-2018, then indicate, "Same as the last reporting period: no changes".

Richmond's Flood Protection Management Strategy identifies climate change issues and provides high level guidance on the City's flood mitigation improvements. A key component of the Flood Protection Management Strategy is the Dike Master Plan, which guides the City's dike raising efforts. The plan is being completed in multiple phases, each identifying dike upgrade options and recommendations for different areas throughout the City. These recommendations address long term risks such as climate change-induced sea level rise, higher intensity storms, and spring snow melt. These risks are mitigated by the City's proactive and extensive flood protection efforts.

Action 3.4.6 –	Ensure liquid waste infrastructure and services are provided in accordance with the Regional Growth Strategy and coordinated with municipal Official Community Plans *(Ongoing).*

Attachment 9:

a) If not already provided, provide updated GIS shape files of the municipal sanitary sewer network, including manholes, pump stations, pipe diameters for the municipol sewer system. Please indicate what changes have been made for 2019-2020.

***NOTE:** This information is part of the routine information provided to Metro Vancouver every two yeors in response to municipal obligations under the GVS&DD Act. This information will be used to update Metro Voncouver's GIS database. If this information is open-source and already available online, please just indicate that it is available online and is open-source.*

Action 3.4.7 –	Develop and implement integrated stormwater management plans at the watershed scale that integrate with land use to manage rainwater runoff *(2014).*

Narrative 23: Summarize and highlight key initiotives relating to the development and implementation of the integrated stormwater management plans ***for each watershed/ISMP area.***

***NOTE:** Format and content should be similar to the reporting provided in previous Interim Reports for the Integrated Liquid Waste and Resource Management Plan. See: http://www.metrovancouver.org/services/liquid-waste/LiquidWostePublications/IntegratedLiquidWasteResourceManagementPlanInterimReport2017.pdf*

Same as the last reporting period: no changes.

Attachment 10:

a) GIS shape files showing the ISMP boundaries and their status: Development Phose= Yellow; Implementation Phase = Light Green; Completed Phase = Dark Green. Add ISMPs still to start development as outlined only).

***NOTE:** The ISMPs will be summorized ond mapped similar to the Biennial ond Interim Reports.*

Action 3.5.8 –	Biennially produce a progress report on plan implementation for distribution to the Ministry of the Environment that: (a) summarizes progress from the previous two years on plan implementation for all municipal actions, including the status of the performance measures, (b) includes summaries and budget estimates for proposed LWMP implementation programs for the subsequent two calendar years *(July 1st biennially).*

List budget estimates for the LWMP implementation programs and subsequent two years beyond biennial report (from the 5-year plan)

Table 9 Summary of LWMP Implementation Budgets and Forecasts

LWMP Implementation Action	Details/Notes	Budget			
		2019	2020	2021*	2022*
Sanitary Sewer Capital Program	Includes pump station replacement, gravity sewer and forcemain replacement, and sanitary rehabilitation works	*1.1M*	*12.9M*	*4.3M*	*5.3M*
Development Projects (Servicing Agreements)		*1.7M*	*2.4M*	*Unknown*	*Unknown*

** Subject to council approval*

Action 3.5.9 –	*This reporting is on annual requirement. In the year of the biennial report, this action is covered off by municipal reporting on 3.4.7 & 3.3.7. In other years this addressed through the Interim Report. This municipal reporting is summarized regionally by Metro Vancouver under its Action 3.5.6.*

***Note**: The Interim Report: 2019 was submitted to the Ministry of Environment in February 2019. There is nothing to add in this section.*

Ministerial Condition 2 –	Member municipalities are strongly encouraged to business case and/or implement residential water metering programs and to consider municipal rebate programs for water efficient fixtures and appliances to reduce potable water use.

Narrative 24: Discuss initiatives that evaluate/support water metering and rebate programs to water fixtures and appliances

Richmond has comprehensive water meter programs for both residential and commercial properties. All single-family, industrial, commercial, and farm properties in Richmond are metered. In 2017, Richmond completed implementation of universal water metering for all single-family properties. Multi-

family complexes can volunteer for water meters, with the City providing a maximum subsidy of $100,000 per complex. As of the end of 2020, 50% of multi-family properties are metered in Richmond.

In 2014, Richmond also introduced a pilot project for Fixed Base Meter Reading that facilitates the continuous reading of meters through radio towers. The program provides real time consumption data which allows staff to better help residents identify causes of leaks and water consumption habits. The Fixed Base Network has been deployed and the project is in the final stages of system optimization.

To complement these water meter programs, Richmond provides metered customers with free water conservation kits, which include low flow showerheads, faucet aerators, toilet fill cycle diverters, toilet leak detection tablets, and educational water conservation tools. In addition, Richmond offers a $100 rebate to residents for replacing old toilets with new low-flush toilets, and subsidized rain barrels to collect and store water for outdoor use. Richmond also partnered with BC Hydro to offer $100 rebates for high-efficiency clothes washer replacements. By the end of 2020, a total of 9,411 toilet rebates, 1,956 rain barrels, and 1,369 clothes washer rebates have been issued to Richmond residents.

Ministerial Condition 3 – Metro Vancouver, in partnership with member municipalities, is encouraged to pursue a region-wide water conservation program targeting the industrial, commercial, institutional and agricultural sectors as part of its new Drinking Water Management Plan. Remaining municipalities in the region that have not implemented metering for these sectors are encouraged to do so.

Narrative 25: Summarize whether any new municipal water metering policies or programs were introduced in 2019-2020 that address this action. If no changes, then indicate, "Same as the last reporting period: no changes".

ICI sector is fully metered, no changes.

Ministerial Condition 7 – Member municipalities will, with MV planning and coordination, and to the satisfaction of the Regional Manager, develop a coordinated program to monitor stormwater and assess and report the implementation and effectiveness of Integrated Storm Water Management Plans (ISMPs). The program will use a weight-of-evidence performance measurement approach and will report out in the Biennial Report. The Regional Manager may extend the deadline for completion of ISMP by municipalities from 2014 to 2016 if satisfied that the assessment program could result in improvement of ISMP and protect stream health.

Narrative 26. Quote relevant OCP sections addressing stormwater, stream health and their consideration of ISMPs.

Given the ISMP deadline requirement, please indicate any ISMPs in development but not completed by the end of 2020.

Richmond's Integrated Rainwater Resource Management Strategy (IRRMS) addresses Richmond's needs for water quality treatment and monitoring plan. This plan was endorsed by Richmond Council in April 2016. In 2018 and 2020, the IRRMS sampling program for water quality parameters was conducted. Nine pump stations sample locations were selected to be representative of the majority of Richmond storm water discharge flow volume.

Five samples were collected within 30 days in both the wet and dry seasons and analyzed for general water quality parameters, bacteria (fecal coliform and E.coli) nutrients (nitrate) and select metals.

Attachment 11:

a) *Monitoring results per watershed (as per ISMP Monitoring and Adaptive Management Framework endorsed by the Ministry of Environment and Climate Change Strategy)*

2020 Results will be available in Feb 2021.

b) *A map plus the GIS shape files/coordinates showing the location of monitoring sites*

Not available at this time

Ministerial Condition 9 – The ILWRMP has a goal of protecting public health and the environment. In keeping with this goal and to ensure alignment with other national, provincial and regional initiatives, Metro Vancouver and member municipalities are encouraged to: (a) Have a local land use planning consider the direction provided by the ISMPs, (b) Consider how the degree, type and location of development within a drainage can affect the long-term health of the watershed,(c) Consider how to protect the stream, including the riparian areas that exert an influence on the stream, from long-term cumulative impacts and (d) Use scenarios and forecasting to systematically consider environmental consequences/benefits of different land use approaches prior to build-out (for example, Alternative Future type approaches).

Narrative 27: Please describe any changes to how you have used proactive planning processes as listed in Ministerial Condition 9 for 2019-2020 and provide examples. If there are no changes since 2017-2018, then indicate: "Same as the last reporting period: no changes".

The strategies identified in the IRRMS are consistent with actions identified within the City's Ecological Network Management Strategy (ENMS), adopted by Council in 2015, and submitted in the 2015-2016 reporting period. Through the ENMS the City has identified an interconnected network of natural and

semi-natural areas across Richmond's landscape to protect, connect and restore. These natural areas include green infrastructure that provides essential ecosystems services related to stormwater management. Additional Actions related to Ministerial condition 9 in this reporting period include:

- In 2020, the City hosted three collaboration "coffee" web meetings with environmental compliance regulators from the BC Ministry of Environment and Climate Change Strategy and Environment and Climate Change Canada. Regulators discussed compliance enforcement efforts and sites histories of persistent problem sites and businesses in Richmond
- In November 2019, The City organized a water-based inspection of Mitchell Island with the Coast Guard, the City's consultant KWL, Ministry of Environment and Environment Canada. The boat circumnavigated the island slowly, stopping to take samples, share site regulatory enforcement histories and take pictures of known and unknown sites of concern.
- In 2019, the City of Richmond completed an update on the City's Dangerous Goods Spill Response Plan, which identifies the risk assessment, prevention initiatives, and the preparedness, response and recovery measures in place to manage dangerous goods and pollution incidents in the City of Richmond.

Attachment 12:

a) *Map showing any 2019-2020 changes to protected riparian areas & possible stream classifications. If no changes, then this figure is not required.*

No Changes.

Municipal Progress Summary Table

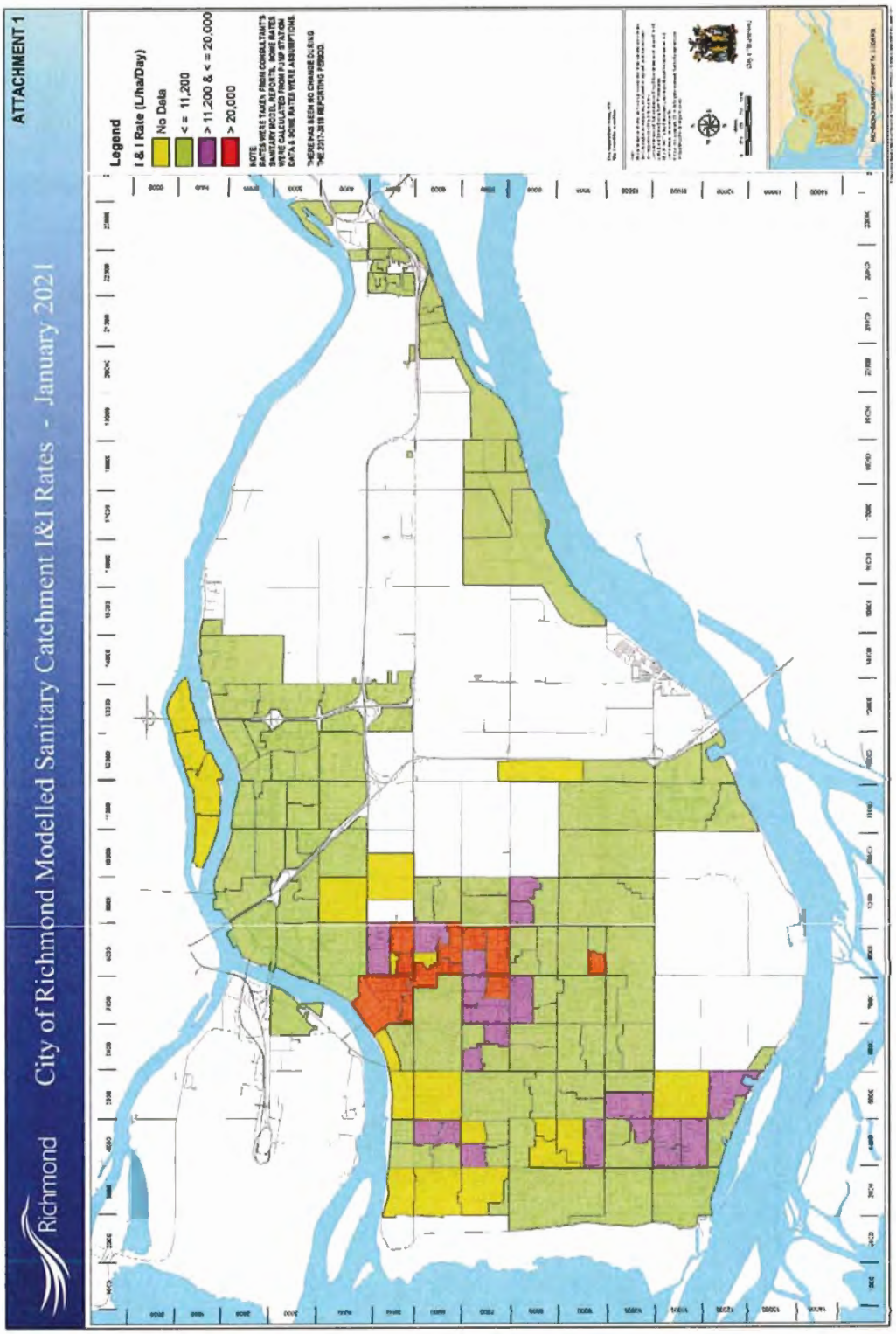
The summary table is the same format at pervious Biennial Report. The columns "Dec 31st 2018" from the previous Biennial Report plus "Additions/Changes" should add to equal the "Dec 2020" Total.

Table 10 Summary of Municipal Progress 2019-2020

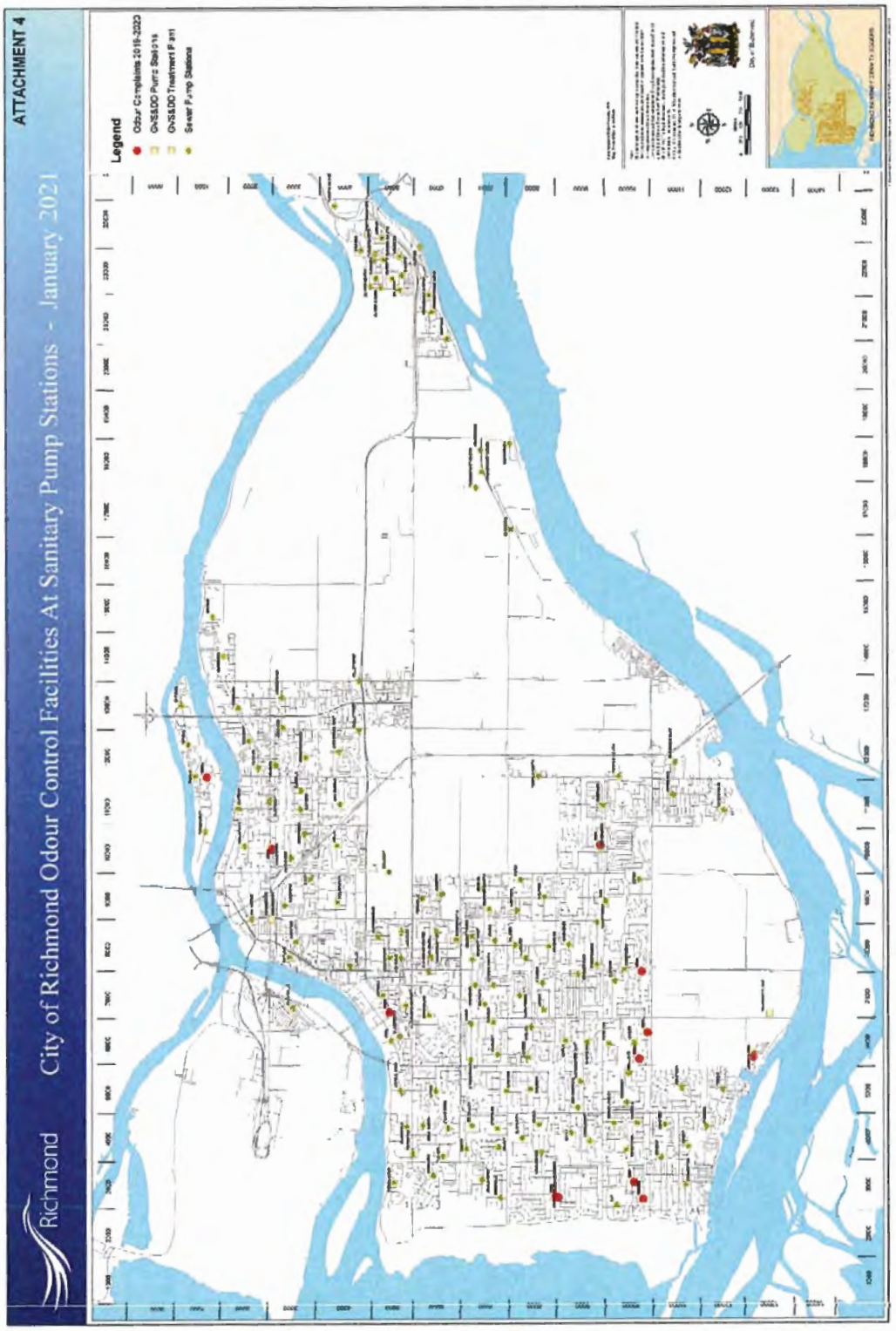
Description	Unit	Total as of Dec 31st, 2018	Additions & Changes	Total as of Dec 31st, 2020
1. Municipal Sewer System Inventory				
a. Sanitary Gravity Sewers (*excluding private systems)	m	469,300	0	468,880*
b. Sanitary Services (Connections)	ea.	31,529	76	31,605
c. Sanitary Forcemains	m	101,200	0	101,200
2. Combined Sewer System Inventory				
a. Total Combined Sewers	m	n/a	n/a	n/a
b. Combined Services (Connections)	ea.	n/a	n/a	n/a
c. Combined Sewers Separated	m	n/a	n/a	n/a
d. Percentage of total system separated	%	n/a	n/a	n/a
3. Sanitary Sewer System Evaluation Program				
a. Sanitary Sewers Video Inspected	m	448,887	5,502	454,389
b. Percentage of Entire Municipal Sewer System Dye & Smoke Tested	%	0.7	n/a	0.7
c. Percentage of Entire Municipal Sewer System Video Inspected	%	100	0	100
d. Percentage of Entire Municipal Sewer System Structurally Rated	%	100	0	100
4. Sewer System Rehabilitation				
a. Total Length of Sewers Rehabilitated	m	2,584	0	2584
b. Total Length of Sewers Replaced/Capacity Upgraded	m	16,125	3,532	19,657
c. Total Number of Service Laterals Rehabilitated	ea.	50	4	54
d. Number of Structurally Repaired Manholes/Cleanouts	ea.	4,302	741	5043
e. Number of Cross-Connections Corrected	ea.	11	0	11
5. Sanitary Sewer Overflows				
a. Total Number of Reported Dry Weather SSOs	ea.	0	0	0

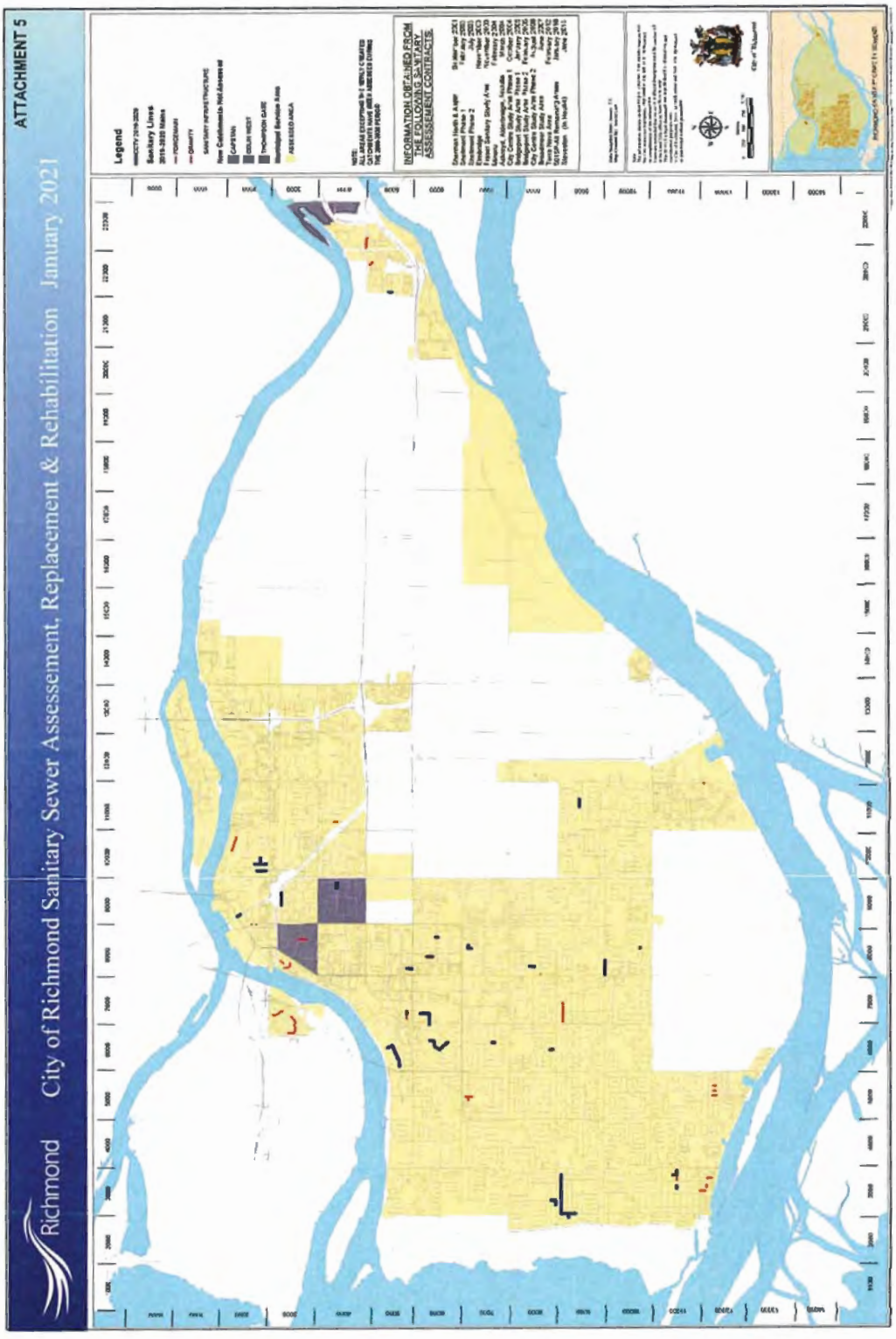
Description	Unit	Total as of Dec 31st, 2018	Additions & Changes	Total as of Dec 31st, 2020
b. Total Number of Reported Wet Weather SSOs	ea.	0	0	0
c. Number of Breakdowns from Failures	ea.	136	11	147
6. Greenhouse Gas Emissions				
a. CO_2 emission reduction from sewer system	kg CO_2	n/a	n/a	n/a
7. Summary of Costs		**2019**	**2020**	**Total**
a. Sanitary Sewer Condition Evaluation Program		0	0.15M	0.15M
b. Combined Sewer Separation Program		n/a	n/a	n/a
c. Sewer System Rehabilitation Program		0.95M	2.60M	3.55M
d. CO_2 Reduction Program		0	0	0
e. ISMP Implementation		0	0	0
f. Total Cost for the Biennial Period		0.95M*	2.75M*	3.7M*

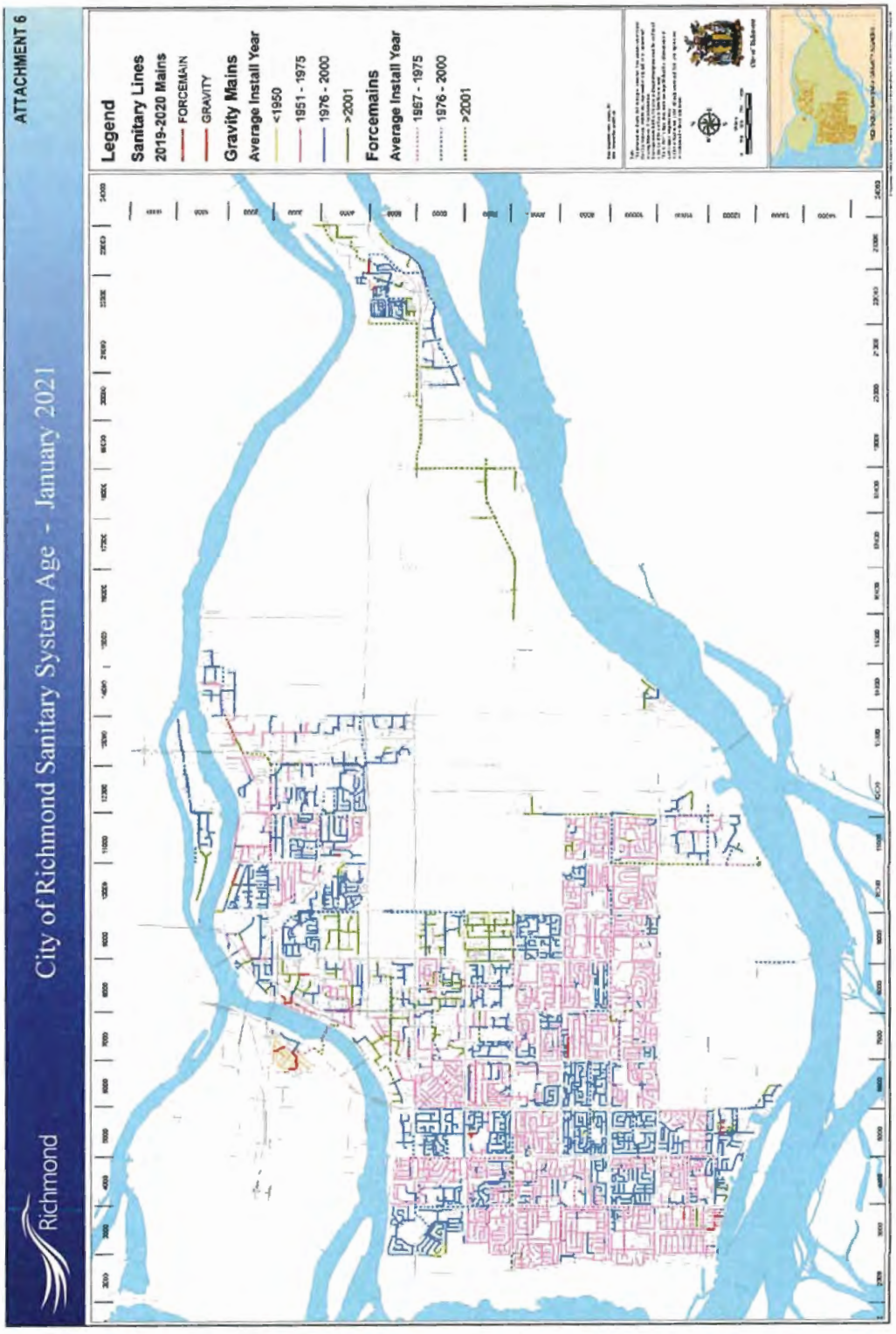
**Cost associated with items listed under 7-a to 7-e only. Capital investments associated with other aspects of sanitary system management are not included.*

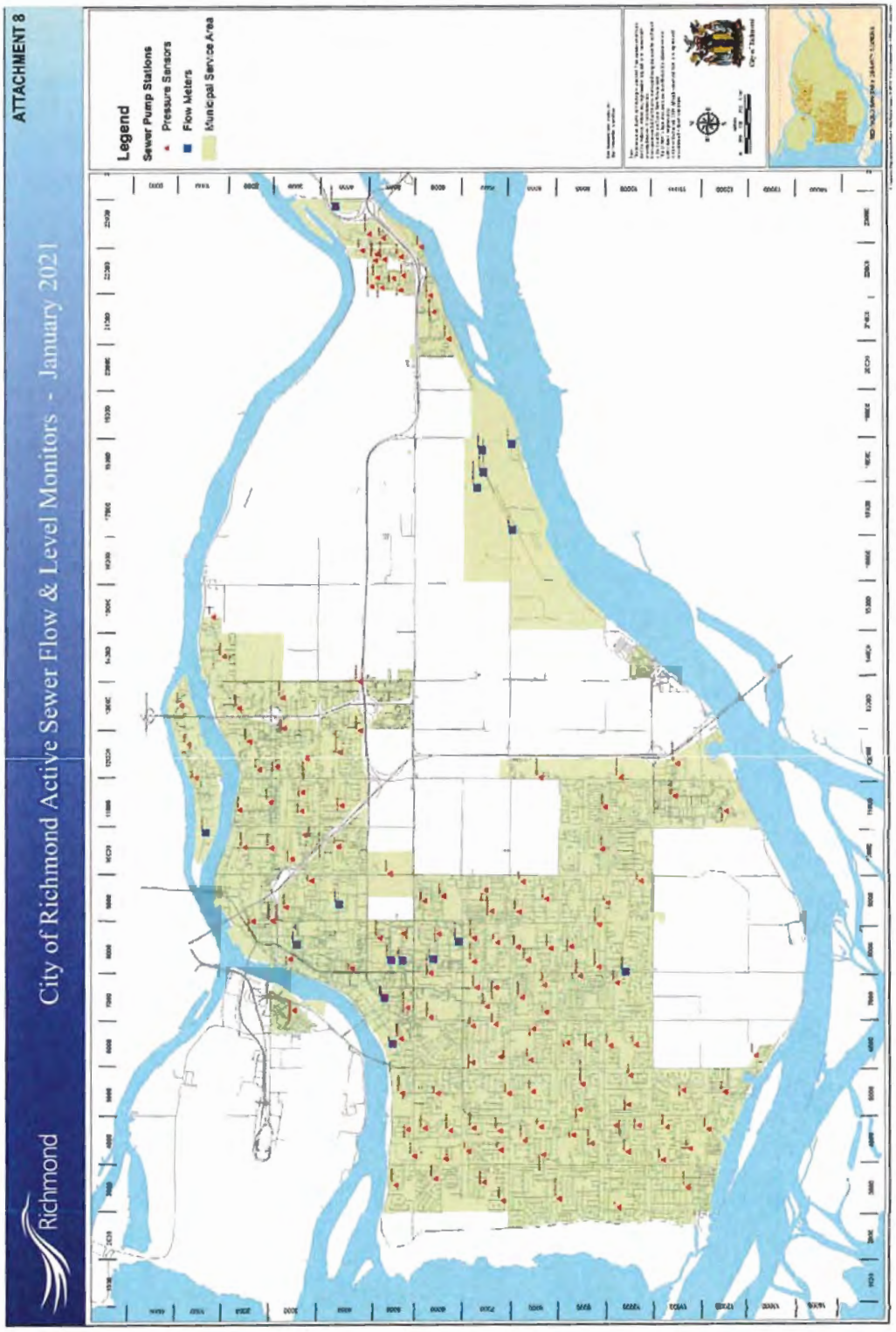

ATTACHMENT 1
City of Richmond Modelled Sanitary Catchment I&I Rates - January 2021
Richmond
Legend
I & I Rate (L/ha/Day)
No Data
< = 11,200
> 11,200 & < = 20,000
> 20,000

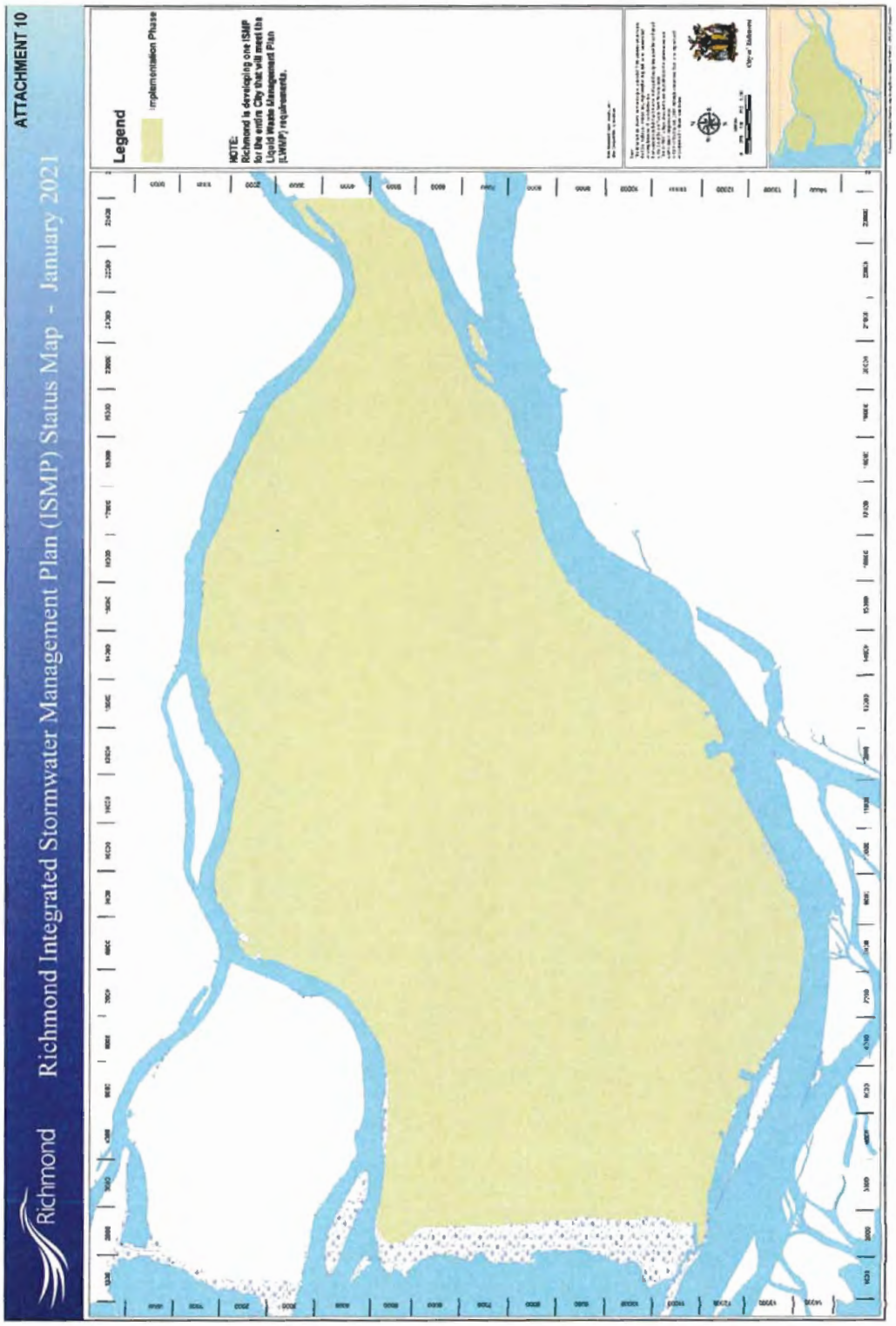
6599619


ATTACHMENT 4
City of Richmond Odour Control Facilities At Sanitary Pump Stations - January 2021
Richmond
Legend
Odour Complaints 2019-2020
OVS&DO Purre Stations
OVS&DO Treatment Plant
Sewer Pump Stations


ATTACHMENT 5
City of Richmond Sanitary Sewer Assessement, Replacement & Rehabilitation January 2021
Richmond
Legend
Sanitary Lines
INFORMATION OBTAINED FROM TREADGOLD'S SANITARY ASSESSMENT CONTRACT


ATTACHMENT 6
City of Richmond Sanitary System Age - January 2021
Richmond
Legend
Sanitary Lines
2019-2020 Mains
FORCEMAIN
GRAVITY
Gravity Mains
Average Install Year
<1950
1951 - 1975
1976 - 2000
>2001
Forcemains
Average Install Year
1951 - 1975
1976 - 2000
>2001


ATTACHMENT 8
City of Richmond Active Sewer Flow & Level Monitors - January 2021
Richmond
Legend
Sewer Pump Stations
Pressure Sensors
Flow Meters
Municipal Service Area


ATTACHMENT 10
Richmond Integrated Stormwater Management Plan (ISMP) Status Map - January 2021
Richmond
Legend
Implementation Phase
NOTE:
Richmond is developing one ISMP for the entire City that will meet the Liquid Waste Management Plan (LWMP) requirements.

City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	February 19, 2021
From:	Milton Chan, P.Eng Director, Engineering	**File:**	10-6060-01/2021-Vol 01
Re:	**Lower Mainland Flood Management Strategy Update**		

Staff Recommendation

That the staff report titled "Lower Mainland Flood Management Strategy Update", dated February 19, 2021, from the Director, Engineering, be received for information.

Milton Chan, P.Eng
Director, Engineering
(604-276-4377)

Att. 1

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Roads & Construction	☑	
SENIOR STAFF REPORT REVIEW	**INITIALS:**	**APPROVED BY CAO**

6620375

Staff Report

Origin

In 2014, the Fraser Basin Council started the development of a Lower Mainland Flood Management Strategy (LMFMS) with the purpose of providing a better understanding of regional flood hazards, flood vulnerabilities and the state of flood protection infrastructure, policies and practices across the region. The City of Richmond has been a funding partner supporting the LMFMS along with most local governments and agencies in the region.

The Fraser Basin Council released draft 1 of a region-wide strategy (Flood Strategy) to member organizations on January 29, 2021, and has asked for comments to be returned to them by March 29, 2021. A major component of this draft is the establishment of a provincially-mandated regional entity to oversee implementation and funding of the works included in the Flood Strategy.

This report provides Council with an update on the LMFMS and Flood Strategy and the related staff comments.

This report supports the following strategies within Council's Strategic Plan 2018-2022:

Strategy #1 A Safe and Resilient City:

> *Enhance and protect the safety and well-being of Richmond.*
>
> *1.2 Future-proof and maintain city infrastructure to keep the community safe.*
>
> *1.3 Ensure Richmond is prepared for emergencies, both human-made and natural disasters.*

Strategy #2 A Sustainable and Environmentally Conscious City:

> *Environmentally conscious decision-making that demonstrates leadership in implementing innovative, sustainable practices and supports the City's unique biodiversity and island ecology.*
>
> *2.1 Continued leadership in addressing climate change and promoting circular economic principles.*

Strategy #5 Sound Financial Management:

> *Accountable, transparent, and responsible financial management that supports the needs of the community into the future.*
>
> *5.4 Work cooperatively and respectfully with all levels of government and stakeholders while advocating for the best interests of Richmond.*

Analysis

The City's primary rationale for participating in this initiative has been to remain engaged on this issue at the regional level. Independent of the Fraser Basin Council, the City has already completed extensive flood risk management planning and analysis over multiple decades. The most recent Council action on a strategic level was adoption of the updated Flood Protection Management Strategy in 2019. In addition, the City has advanced into the implementation phase over the last two decades with over $13M being committed annually to physical infrastructure upgrades. The Fraser Basin Council work has not yet moved beyond the strategic planning phase, and the technical work completed to date has not significantly added to Richmond's existing plans and strategies.

The Fraser Basin Council's LMFMS is divided into three phases:

- Phase 1 – Understanding Lower Mainland Flood Risks (2014-2016)
  - Project 1 – Analysis of Future Flood Scenarios
  - Project 2 – Regional Assessment of Flood Vulnerabilities
  - Project 3 – Assessment of Flood Infrastructure, Policies & Practices
- Phase 2 – Building a Region-Wide Strategy (2016-2021)
- Phase 3 – Taking Action (2021 and beyond)

Phase 1

Phase 1 of the LMFMS was completed in 2016 and focused on improving the region's understanding of flood scenarios, vulnerabilities and management actions.

As outlined in the staff report titled, "Fraser River Freshet and Flood Protection Update 2016," dated May 31, 2016 from the Director, Engineering, the City has completed Richmond specific analysis and assessments to a higher level of accuracy than Fraser Basin Council's work. Additionally, the City identified concerns with the Phase 1 results due to some inaccurate data and assumptions used by the Fraser Basin Council with respect to information on Richmond's dikes. These issues could have been avoided with improved partner engagement. In subsequent discussions with staff, Fraser Basin Council committed to improving partner engagement throughout the remainder of the Flood Strategy process.

Phase 2

Phase 2 of the LMFMS is underway. This phase includes technical analysis that has fed into the development of a draft region-wide strategy (Flood Strategy).

Technical Analysis

As outlined in the staff memorandum titled, "Lower Mainland Flood Management Strategy – Phase 2 Update" dated August 27, 2020, the technical analysis completed as part of this phase assumed that no flood risk mitigation measures are taken across the region now or in the future. For example, Richmond's Flood Protection Management Strategy, Dike Master Plan, Emergency Response Plan, and Flood Protection Program that all have a much higher level of analysis and detail, have not been factored into their analysis. The mapping and modelling work, however, reinforces the importance of local and regional-scale planning and continued investment in flood risk reduction.

Flood Strategy and Regional Flood Protection Management

In the time since the August 2020 memorandum was provided to Council, Draft 1 of the Flood Strategy has been created. Two major components of Draft 1 of the Flood Strategy include:

1. Establishment of a provincially-mandated regional entity to oversee the implementation of the Flood Strategy. Proposed roles for the entity include delivering regional-scale flood-related technical analysis, communication and education services, establishing and providing funding decisions on the regional priorities.

2. Establishment of a regional funding program to be administered and utilized by the proposed regional flood entity with the intention to support implementation of the Flood Strategy. Priorities for the region would be ranked through a regional prioritization and evaluation framework.

The detailed discussion around these two major components were kept at the Leadership Committee level. The Leadership Committee is made up of representatives of partner organizations including two senior staff at the federal level, two senior staff at the provincial level, four senior staff at the local government level, four elected First Nations representatives and one representing regional entities. The City's request to be included on the Leadership Committee was not accepted.

Fraser Basin Council originally proposed options to change the current province-wide flood protection governance structure through a forum with a regional audience, including municipalities and senior government officials, held on October 8 and 9, 2019. Council subsequently endorsed the City's position on regional flood protection management at the January 27, 2020 Regular Council meeting, as follows:

a. That flood protection continue to be evaluated and managed at the local government level, currently through the Diking Authority model, with additional support from senior levels of government;

b. That dedicated funding for flood protection be established at the Provincial and Federal level, to be used by Diking Authorities, which include local governments, for flood management projects; and

c. That the Province require Diking Authorities, which include local governments, to develop and maintain flood risk management plans and strategies for their respective areas so that regional objectives are met.

Following the January 27, 2020 Regular Council meeting, and as endorsed by Council, staff circulated the City's position on regional flood protection management through a letter to regional Diking Authorities, the Fraser Basin Council and the Province.

Fraser Basin Council has made the decision to include these two major components despite continued opposition expressed by the City of Richmond through the regional forum, several committee meetings and by way of written letter directly to Fraser Basin Council, regional Diking Authorities and the Province.

Adoption of a provincially-mandated regional entity would impact flood protection funding, planning and implementation by local governments. It would also impact the availability and allocation of future grants from senior government to individual local governments. Any reduction in grant funding for the City's flood protection works would result in an increase to utility fees or the requirement to borrow funds.

Next Steps

The Fraser Basin Council has completed valuable work and helped raise the profile of the flood protection challenge presented to the region by climate change and sea level rise. While this work highlights a collective regional risk, it does not present any compelling rationale for moving away from the existing governance structure. Local governments are in the best position to implement flood protection improvements and make associated land use decisions, with Provincial support and co-ordination. Creation of a new entity would add bureaucracy without any discernible benefit.

The Fraser Basin Council has requested review and input from partner organizations and participants by March 29, 2021. Input received will inform the development of a second draft expected to be distributed in May 2021. Public engagement is planned for September 2021, with finalization of the LMFMS by November 2021. A briefing note summarizing the major components and next steps from Fraser Basin Council is included as Attachment 1.

Staff will be providing comments to the Fraser Basin Council that are consistent with Council's previously endorsed position on regional flood protection management.

Financial Impact

None.

Conclusion

Under the existing governance structure, the City of Richmond has established one of the most advanced flood protection programs in the region. Adoption of a provincially-mandated regional entity would impact flood protection funding, planning and implementation. Staff recommend that the City's position on regional flood protection remain focused on being managed and evaluated at the local level, with support from senior government.

Jason Ho, P.Eng
Manager, Engineering Planning
(604-244-1281)

Corrine Haer, P.Eng
Project Manager, Engineering Planning
(604-219-5281)

JH:ch

Att. 1: Briefing Note

Lower Mainland Flood Management Strategy | Draft 1

Briefing Note

for Entities with Flood Management Responsibilities in the Lower Mainland

Purpose

To provide an overview of Draft 1 of the Lower Mainland Flood Management Strategy and the invitation by the Fraser Basin Council to review and comment on Draft 1.

Background

The Lower Mainland Flood Management Strategy (LMFMS or Flood Strategy) is a region-wide strategy to reduce flood risk and improve the flood resilience of communities along British Columbia's lower Fraser River and south coast. It focuses on two regionally significant flood hazards: Fraser River flooding and coastal flooding.

The development of the LMFMS has been a collaborative, inter-jurisdictional, regional-scale and multi-year initiative. The Fraser Basin Council (FBC), a not-for-profit organization, is the manager and facilitator of this initiative on behalf of over 60 organizations with flood management responsibilities, including federal, provincial, First Nations and local governments, and other entities, such as infrastructure organizations. The initiative began in 2014 and has included a combination of technical analysis, information tool development and advisory and engagement processes. The aim of the LMFMS initiative is to build a base of knowledge and support for a common vision and set of actions that will work in concert to reduce flood risk across the Lower Mainland.

A key factor for success is to develop a Flood Strategy that has broad support among all orders of government and other organizations. Input from these organizations will strengthen the breadth and depth of support for the Flood Strategy. Government and other entities with flood management responsibilities, through their respective internal processes, have an important role in reviewing the initial drafts of the Flood Strategy, providing input and determining next steps, including Flood Strategy adoption and implementation. Many of these organizations have participated in and provided financial and in-kind support for the initiative to date.

FBC is inviting review and input on Draft 1[1] of the Flood Strategy over a two-month commenting period. Draft 1 was distributed by email in late January 2021 to partners and participants in the LMFMS development process.

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[1] A preliminary draft, named Draft 1A, was distributed in November 2020 for initial review by First Nations and those serving on LMFMS advisory groups (the Joint Program Committee and Leadership Committee). It is now available as Draft 1 for review and comment by all partner and participating organizations. For clarity, Draft 1 is the same as Draft 1A, with one addition, that being an addendum on governance, funding and implementation (Section 6 of Draft 1).

Flood Strategy Goals and Scope

The draft LMFMS contains seventeen objectives under three overarching goals:

1) **Improve understanding of Lower Mainland flood risk and increase awareness**

   Objectives under this goal include improving understanding of flood risk and risk-based flood management as well as access to information.

2) **Support investment and actions to reduce flood risk, avoid the creation of new risk, and build resilience of communities, ecosystems and critical infrastructure**

   Objectives emphasize integrated, innovative approaches to reducing flood risk in ways that support the resilience of ecosystems, society and critical infrastructure and account for climate change impacts.

3) **Strengthen flood risk governance in the Lower Mainland**

   Objectives include furthering collaboration and coordination, reconciliation with First Nations, improving capacity and accounting for the inter-jurisdictional nature of flood.

Together, the goals and objectives reflect the region's diverse challenges and opportunities and are intended to achieve the Flood Strategy's vision for the Lower Mainland as a flood-resilient region.

The Flood Strategy is focused on addressing Fraser River and coastal flood risks while recognizing that many communities also experience flooding from other sources. The Flood Strategy is not prescriptive in that it does not recommend specific flood risk reduction projects in specific locations. This scope recognizes the important role of existing and future flood management plans, decisions and initiatives at the local and sub-regional scales.

Key Directions

Draft 1 of the LMFMS contains 68 recommended actions to advance the Flood Strategy's goals and objectives. The following is an overview of the major directions proposed. (Numbers in parentheses refer to Draft 1 sections that contain related recommendations.)

Regional prioritization: A core concept of the LMFMS is the prioritization of flood risk areas in the region for flood risk reduction. Current approaches to flood-related project funding tend to be based largely on the merit of applications. This can benefit communities with greater access to technical information and resources regardless of the relative need and urgency of the project compared with other jurisdictions. A process to determine the relative priority of flood risk areas in advance would ensure that areas with higher risk, need and urgency are identified and provide a shared understanding to inform where and how investments should be made. Draft 1 presents draft criteria that are intended to be refined and integrated into a prioritization framework that would ultimately be used to inform funding decisions for risk reduction initiatives. Equity is an important consideration in the proposed approach. (5.3.3)

Holistic approach to flood risk reduction initiatives: While regional prioritization considers where and when flood risk reduction actions are most needed, the Flood Strategy also addresses *how* flood risk could be reduced by recommending development of a framework to guide the

design and evaluation of flood risk reduction initiatives. The framework would ultimately inform funding and decision-making. Draft 1 presents draft criteria under four broad categories as the basis of this proposed framework: impacts on flood risk; alignment with existing frameworks; design for a range of positive impacts (e.g., ecosystem resilience); and the process of planning, design and implementation. The criteria support reducing flood risk in a way that minimizes negative impacts, produces positive co-benefits, can be adapted and sustained in the long term, and supports the values identified by LMFMS partners, while recognizing that the same approaches will not be appropriate in all circumstances. (5.2.2)

Enabling and supporting integrated flood management measures: The draft Flood Strategy contains recommendations designed to facilitate and widen the suite of flood risk reduction measures considered, including a range of structural (e.g., diking) and non-structural (e.g., land use) measures. Some recommendations propose changes to provincial legislation, standards and guidelines. Others consider incentives, guidance and further study to advance understanding and uptake of risk-based approaches and alternatives to conventional flood protection infrastructure, including land use regulation and nature-based approaches. These recommended actions are intended to support organizations in achieving their risk reduction objectives along with the objectives of the Flood Strategy and, more specifically, the risk reduction framework described above. (5.2.1, 5.2.3, 5.2.4)

Enhancing First Nations capacity: The LMFMS aims to support reconciliation with First Nations and address inequities in flood management, including but not limited to improving capacity and access to opportunities for flood risk reduction. Some draft recommendations include improving flood hazard and risk information in First Nations communities, as well as protocols for including Indigenous knowledge and values in flood planning. Others speak to enhancing First Nations capacity for emergency preparedness and response, flood planning and decision-making, and participation in flood initiatives of other jurisdictions. (5.2.5, 5.3.2)

Improving collaboration and coordination: Core to the LMFMS is the recognition that floods and their consequences extend across jurisdictional boundaries and that flood management activities in one jurisdiction can have (and have historically had) significant impacts on others. The draft Flood Strategy recommends actions to improve collaboration, coordination and communication among governments and non-governmental organizations across the region. Actions to improve collaboration with and the participation of First Nations in alignment with the BC Declaration on the Rights of Indigenous Peoples Act are emphasized. (5.3.1, 5.3.2)

Regional technical services, information sharing and education: Widespread understanding of flood risks along with access to and sharing of information are key to supporting flood risk reduction over the long-term. Draft 1 proposes programs and other actions to deliver regional-scale flood hazard and risk modelling and mapping, opportunities for sharing information among jurisdictions, and public education and communications. The Strategy recognizes the limited capacity of many communities and the value of undertaking some of these actions at the regional scale. (5.1.1, 5.1.2, 5.1.3)

To support implementation of the recommended actions, the LMFMS contains two key proposals:

1) **Establishment of a regional flood entity:** While some of the recommended actions could be led by existing organizations, no existing organization has the capacity or

responsibility to oversee the implementation of the Flood Strategy as a whole. The draft Flood Strategy recommends the establishment of a provincially mandated regional entity to implement and oversee implementation of the LMFMS. It would include a Board structure composed of First Nations, local, provincial and federal governments and infrastructure providers. Proposed roles for the entity include delivering regional-scale flood-related technical, communications and education services; establishing regional priorities for flood risk reduction; advising on or delivering funding decisions for regional, sub-regional and local initiatives pertaining to the Flood Strategy; and supporting collaborative flood planning within the Lower Mainland. It is currently proposed that the entity would not assume the responsibilities of existing jurisdictions. (6.1.1)

2) **Establishment of a regional funding program:** The draft Flood Strategy proposes the establishment of a long-term, stable regional funding program to a) support implementation of LMFMS recommendations; b) implement regional, sub-regional and local flood management initiatives aligned with the LMFMS; and c) support the operations of the proposed regional flood entity. Current funding arrangements are unpredictable, focus primarily on emergency response and recovery, and typically are available for a limited time period and for a relatively narrow set of eligible projects and activities. The proposed funding program, administered by the proposed regional entity and supported by the regional prioritization and evaluation frameworks, would provide greater predictability and would enhance capacity for a broader range of proactive flood risk management activities. (6.1.2)

Next Steps

- **FBC will receive feedback on Draft 1 through Monday, March 29, 2021.** Organizations that are invited to provide feedback can email the completed PDF (and any accompanying documents, e.g., staff report, if available) to floodstrategy@fraserbasin.bc.ca.
- FBC will host a webinar presentation on Draft 1 on February 16, 2021. The presentation will be recorded and shared for viewing by organizations invited to provide feedback. Additional engagement sessions and/or materials may be delivered during the commenting period.
- Input received by March 29 will inform the development of Draft 2. Draft 2 will be distributed in May 2021 for review by all organizations that were invited to comment on Draft 1. This allows for two rounds of review prior to a period of public comment.
- Public engagement on the LMFMS is planned for September 2021.
- The Flood Strategy will be finalized by November 2021.

Contact

For more information, or to specify an alternative contact for your organization, email Steve Litke at slitke@fraserbasin.bc.ca.

Name: Richard Schwartz
Address: 10271 Springmont Dr.
Phone: 604-754-1482
RE: REQUEST TO ADD CROSSWALK TO ACCESS MANOAH STEVES PARK
Pages: 6 in total

Issue: There is no safe way to cross from the west side of Springmont Drive to the east side in order to access Manoah Steves Park and Manoah Steves Elementary School. Same issue crossing back.

Context: Cars and busses drive very quickly when travelling northbound or southbound on Springmont Drive and children and elderly people, who move slower and require more care, have to avoid fast moving traffic. When it is dark, it is even more dangerous to cross the road. Also, since the road bends just south of the park, it is very challenging to see vehicles (and for vehicles to see pedestrians) travelling northbound until the very last few seconds. I have three young kids and they have to cross back and forth to get to the park and back. I get worried about the busses and traffic driving at 50+ km/hr up and down Springmont Dr. and do not slow down at the crossing area. There is currently no crosswalk on Springmont Dr. at the park entrance.

Solution: Add a simple painted crosswalk on Springmont Drive at the pathway that enters into the park and add a crosswalk sign on either side of the road. The exact location of the crosswalk would be at the Walkway sign just south of 10340 Springmont Dr. It could be something like is currently on Fourth Avenue, which is at the other side of Manoah Steves park.

Please refer to the photos attached on the pages below.

Current access to Manoah Steves park on Springmont Dr. No crosswalk.

There is only a small Walkway sign on the side of the road, but no crosswalk.

I propose adding a painted crosswalk and some crosswalk signs.


Proposed crosswalk on the West side of Manoah Steves park.

This is the crosswalk on Fourth Avenue on the East side of Manoah Steves park that we could model.