GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT (GVS&DD) BOARD OF DIRECTORS

BOARD MEETING
Friday, November 29, 2024
9:00 am
28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia
Webstream available at https://metrovancouver.org

Membership and Votes

REVISED AGENDA[1]

A. ADOPTION OF THE AGENDA

1. November 29, 2024 Meeting Agenda
That the GVS&DD Board adopt the agenda for its meeting scheduled for November 29, 2024 as circulated.

B. ADOPTION OF THE MINUTES

1. November 1, 2024 Meeting Minutes *pg. 5*
That the GVS&DD Board adopt the minutes for its meeting held November 1, 2024 as circulated.

C. DELEGATIONS

D. INVITED PRESENTATIONS

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

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

1. ZERO WASTE COMMITTEE REPORTS

1.1 Solid Waste Management Plan Independent Consultation and Engagement Panel Updated Terms of Reference *pg. 11*

That the GVS&DD Board receive for information the updated Terms of Reference for the Solid Waste Management Plan Independent Consultation and Engagement Panel as presented in Attachment 1 of the report dated October 24, 2024 titled, "Solid Waste Management Plan Independent Consultation and Engagement Panel Updated Terms of Reference".

2. LIQUID WASTE COMMITTEE REPORTS

2.1 Liquid Waste Management Plan Phase 2 Engagement *pg. 17*

That the GVS&DD Board receive for information the report dated November 5, 2024, titled "Liquid Waste Management Plan Phase 2 Engagement."

2.2 Endorsement of the Interim Draft Liquid Waste Management Plan *pg. 160*

That the GVS&DD Board endorse the interim draft Liquid Waste Management Plan and authorize staff to proceed with phase three of the plan's review and update process, as outlined in the report dated November 5, 2024, titled "Endorsement of the Interim Draft Liquid Waste Management Plan".

2.3 Update on the Development of a Construction Impact Mitigation Framework *pg. 289*

That the GVS&DD Board receive for information the report dated November 6, 2024, titled "Update on the Development of a Construction Impact Mitigation Framework".

2.4 Authorization of a Contract Amendment to 19-112 Utility Residuals Management Hauling Services *pg. 362*

That the GVS&DD Board approve the amendment of contract 19-112 Utility Residuals Management Hauling Services to include the following greenhouse gas emissions mitigation item:

a) switch from current fossil fuel-based diesel to renewable diesel in the residuals hauling fleet at a cost of up to $1,701,000 (exclusive of taxes) over the five-year term, subject to final review by the Commissioner; and

b) authorize the Commissioner to execute the required documentation once the Commissioner is satisfied that the award should proceed.

2.5 Seeking Federal Support for the Development of a Flushability Standard *pg. 371*

That the GVS&DD Board direct staff to submit the following resolution to Federation of Canadian Municipalities:

FLUSHABILITY STANDARD DEVELOPMENT

WHEREAS, in March 2023, FCM called on the federal government for a moratorium on the "flushable" designation in Canada until an appropriate standard is created to ensure the veracity and validity of the potential for degradation in sewers in order to eradicate the impact of “flushable wipes” and similar products on wastewater infrastructure; and

WHEREAS, responses from the federal government to date describe limitations of creating future legislation or regulations without a standard definition of “flushability”; and

WHEREAS, the development of a Canada-wide standard for “flushability” would serve a critical role in defining what constitutes a flushable product and could be referenced in future legislation or regulations; therefore be it

RESOLVED, That FCM urge the federal government to support the development of a flushability standard through a Standards Council of Canada-accredited standards development organization; and be it further

RESOLVED, That FCM requests that the federal government funds and mandates that an appropriate coordinating body be formed to manage the development of a flushability standard through a Standards Council of Canada-accredited standards development organization to be completed within 5 years.

F. ITEMS REMOVED FROM THE CONSENT AGENDA

G. REPORTS NOT INCLUDED IN CONSENT AGENDA

H. MOTIONS FOR WHICH NOTICE HAS BEEN GIVEN

I. OTHER BUSINESS

1. GVS&DD Board Committee Information Items and Delegation Summaries *pg. 376*

Revised

J. RESOLUTION TO CLOSE MEETING

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

That the GVS&DD Board close its meeting scheduled for November 29, 2024 pursuant to section 226 (1) (a) of the *Local Government Act* and the *Community Charter* provisions as follows:

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

- (e) the acquisition, disposition or expropriation of land or improvements, if the council considers that disclosure could reasonably be expected to harm the interests of the municipality;
- (g) litigation or potential litigation affecting the municipality;
- (i) the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose; and
- (k) negotiations and related discussions respecting the proposed provision of a municipal service that are at their preliminary stages and that, in the view of the council, could reasonably be expected to harm the interests of the municipality if they were held in public.

K. ADJOURNMENT

That the GVS&DD Board adjourn its meeting of November 29, 2024.

GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT
BOARD OF DIRECTORS

Minutes of the Regular Meeting of the Greater Vancouver Sewerage and Drainage District (GVS&DD) Board of Directors held at 10:21 am on Friday, November 1, 2024, in the 28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia.

MEMBERS PRESENT:

Burnaby, Chair, Director Mike Hurley
Anmore, Vice Chair, Director John McEwen
Burnaby, Director Pietro Calendino
Burnaby, Director Sav Dhaliwal
Coquitlam, Director Craig Hodge
Coquitlam, Director Teri Towner
Delta, Director Rod Binder*
Delta, Director Dylan Kruger
Electoral Area A, Director Jen McCutcheon
Langley City, Director Paul Albrecht
Langley Township, Alternate Director Tim Baillie for Director Steve Ferguson
Langley Township, Director Eric Woodward
Maple Ridge, Director Dan Ruimy
New Westminster, Director Patrick Johnstone
North Vancouver City, Director Linda Buchanan
North Vancouver District, Director Lisa Muri
Pitt Meadows, Director Nicole MacDonald
Port Coquitlam, Director Brad West*
Port Moody, Director Meghan Lahti*
Richmond, Director Chak Au
Richmond, Director Malcolm Brodie
Richmond, Director Bill McNulty
Surrey, Director Harry Bains
Surrey, Director Doug Elford
Surrey, Director Gordon Hepner*
Surrey, Director Pardeep Kooner
Surrey, Director Brenda Locke
Surrey, Director Rob Stutt
Vancouver, Director Rebecca Bligh
Vancouver, Director Lisa Dominato
Vancouver, Director Sarah Kirby-Yung
Vancouver, Director Mike Klassen
Vancouver, Director Peter Meiszner
Vancouver, Alternate Director Brian Montague for Director Ken Sim
Vancouver, Director Lenny Zhou
West Vancouver, Alternate Director Sharon Thompson for Director Mark Sager
White Rock, Director Megan Knight*
Commissioner Jerry W. Dobrovolny (Non-voting member)

* denotes electronic meeting participation as authorized by the *Procedure Bylaw*

STAFF PRESENT:

Dorothy Shermer, Corporate Officer
Rapinder Khaira, Legislative Services Coordinator, Board and Information Services

A. ADOPTION OF THE AGENDA

1. November 1, 2024 Meeting Agenda

It was MOVED and SECONDED
That the GVS&DD Board adopt the agenda for its meeting scheduled for November 1, 2024 as circulated.

CARRIED

B. ADOPTION OF THE MINUTES

1. September 27, 2024 Meeting Minutes

It was MOVED and SECONDED
That the GVS&DD Board adopt the minutes for its meeting held September 27, 2024 as circulated.

CARRIED

2. October 16, 2024 Special Joint Meeting Minutes

It was MOVED and SECONDED
That the GVS&DD Board adopt the special joint minutes for its meeting held October 16, 2024 as circulated.

CARRIED

C. DELEGATIONS

No items presented.

D. INVITED PRESENTATIONS

No items presented.

E. CONSENT AGENDA

It was MOVED and SECONDED
That the GVS&DD Board adopt the recommendations presented in the following items as presented in the November 1, 2024 GVS&DD Consent Agenda:

1.1 Award of RFP No. 23-404 for Supply and Delivery of Standby Diesel Generators for Iona Island Wastewater Treatment Plant Projects

1.2 Annacis Island Wastewater Treatment Plant Digester No. 5 – Stage Gate 0 Approval

CARRIED

The items and recommendations referred to above are as follows:

1.1 Award of RFP No. 23-404 for Supply and Delivery of Standby Diesel Generators for Iona Island Wastewater Treatment Plant Projects

Report dated September 19, 2024, from George Kavouras, Director, Procurement, Procurement and Real Estate Services, and Winnie Shi, Director, Major Projects, Iona Island Wastewater Treatment Plant, providing the GVS&DD Board with an opportunity to approve the award of RFP 23-404 for Supply and Delivery of Standby Diesel Generators for Iona Island Wastewater Treatment Plant Projects in the amount of up to $14,052,914 (exclusive of taxes) to Finning (Canada) a division of Finning International Inc., for a one time-time purchase.

Recommendation

That the GVS&DD Board:

a) approve the award of RFP 23-404 for Supply and Delivery of Standby Diesel Generators for Iona Island Wastewater Treatment Plant Projects in the amount of up to $14,052,914 (exclusive of taxes) to Finning (Canada) a division of Finning International Inc., for a one time-time purchase, subject to final review by the Commissioner; and

b) authorize the General Manager, Procurement and Real Estate to execute the required documentation once the General Manager, Procurement and Real Estate is satisfied that the award should proceed.

Adopted on Consent

1.2 Annacis Island Wastewater Treatment Plant Digester No. 5 – Stage Gate 0 Approval

Report dated September 26, 2024, from Bob Cheng, Director, Major Projects, Project Delivery, providing the GVS&DD Board with an opportunity to approve the Annacis Island Wastewater Treatment Plant Digester No. 5 advancing from the Initiation phase to the Definition phase (Stage Gate 0).

Recommendation

That the GVS&DD Board approve the Annacis Island Wastewater Treatment Plant Digester No. 5 advancing from the Initiation phase to the Definition phase (Stage Gate 0), as described in the report dated September 26, 2024, titled “Annacis Island Wastewater Treatment Plant Digester No. 5 – Stage Gate 0 Approval”.

Adopted on Consent

F. ITEMS REMOVED FROM THE CONSENT AGENDA

No items presented.

G. REPORTS NOT INCLUDED IN CONSENT AGENDA

1.1 GVS&DD Tipping Fee and Solid Waste Disposal Regulation Amendment Bylaw No. 383, 2024 - Amends Bylaw 379, 2024

Report dated September 24, 2024, from Allen Jensen, Senior Project Engineer, Solid Waste Services, providing the GVS&DD Board with an opportunity to consider *Greater Vancouver Sewerage and Drainage District Tipping Fee and Solid Waste Disposal Regulation Amendment Bylaw No. 383, 2024* for first, second, and third readings, and adoption.

It was MOVED and SECONDED

That the GVS&DD Board:

a) approve the following amendments to the Tipping Fee Bylaw effective January 1, 2025:
   I. increase garbage tipping fees by $7 per tonne for all weight categories;
   II. increase the generator levy by $3 per tonne; and
   III. other rate changes and revisions as described in the report dated September 24, 2024, titled "GVS&DD Tipping fee and Solid Waste Disposal Regulation Amendment Bylaw No. 383, 2024 – Amends Bylaw 379, 2024";
b) give first, second and third reading to *Greater Vancouver Sewerage and Drainage District Tipping Fee and Solid Waste Disposal Regulation Amendment Bylaw No. 383, 2024*.

CARRIED

It was MOVED and SECONDED

That the GVS&DD Board adopt *Greater Vancouver Sewerage and Drainage District Tipping Fee and Solid Waste Disposal Regulation Amendment Bylaw No. 383, 2024*.

CARRIED

2.1 2025 - 2029 Financial Plan – Liquid Waste Services

Report dated October 3, 2024, from Peter Navratil, General Manager, Liquid Waste Services, providing the GVS&DD Board with an opportunity to consider *Greater Vancouver Sewerage and Drainage District Cost Apportionment Amendment Bylaw No. 384, 2024* and *Greater Vancouver Sewerage and Drainage District North Shore Wastewater Treatment Plant Reserve Funds Bylaw No. 385, 2024* for first, second, and third readings, and adoption.

It was MOVED and SECONDED

That the GVS&DD Board:

a) approve the amendments to the *Greater Vancouver Sewerage and Drainage District Cost Apportionment Bylaw No. 283, 2014* as presented in the report dated October 3, 2024 titled "2025 - 2029 Financial Plan – Liquid Waste Services";
b) give first, second and third reading to *Greater Vancouver Sewerage and Drainage District Cost Apportionment Amendment Bylaw No. 384, 2024*.

CARRIED

Alternate Director Baillie, and Directors Buchanan and Woodward voted against

It was MOVED and SECONDED
That the GVS&DD Board pass and finally adopt *Greater Vancouver Sewerage and Drainage District Cost Apportionment Amendment Bylaw No. 384, 2024*.

CARRIED
Alternate Director Baillie, and Directors Buchanan and Woodward voted against

It was MOVED and SECONDED
That the GVS&DD Board:

a) approve the *Greater Vancouver Sewerage and Drainage District North Shore Wastewater Treatment Plant Reserve Funds Bylaw No. 385, 2024* as presented in the report dated October 3, 2024 titled "2025 - 2029 Financial Plan – Liquid Waste Services";
b) give first, second and third reading to *Greater Vancouver Sewerage and Drainage District North Shore Wastewater Treatment Plant Reserve Funds Bylaw No. 385, 2024*.

CARRIED
Alternate Director Baillie, and Directors Buchanan and Woodward voted against

It was MOVED and SECONDED
That the GVS&DD Board pass and finally adopt *Greater Vancouver Sewerage and Drainage District North Shore Wastewater Treatment Plant Reserve Funds Bylaw No. 385, 2024*.

CARRIED
Alternate Director Baillie, and Directors Buchanan and Woodward voted against

3.1 GVS&DD 2025 Budget and 2025 - 2029 Financial Plan

Report dated October 25, 2024, from Harji Varn, Chief Financial Officer/General Manager, Financial Services, providing the GVS&DD Board with an opportunity to consider and approve the 2025 GVS&DD Annual Budget for Liquid Waste Services and endorse the GVS&DD 2025 – 2029 Financial Plan.

It was MOVED and SECONDED
That the GVS&DD Board:

a) approve the 2025 Annual Budget and endorse the 2025 - 2029 Financial Plan as shown in Attachment 1 of the report dated October 25, 2024, titled "GVS&DD 2025 - 2029 Financial Plan", in the following schedules:
   - Revenue and Expenditure Summary
   - Liquid Waste Services
   - Capital Portfolio – Liquid Waste Services
   - Solid Waste Services
   - Capital Portfolio – Solid Waste Services
b) approve the 2025 Reserve Applications as shown in Attachment 2 of the report dated October 25, 2024, titled "2025 Reserve Applications".

CARRIED
Alternate Director Baillie, and Directors Buchanan and Woodward voted against

H. MOTIONS FOR WHICH NOTICE HAS BEEN GIVEN

No items presented.

I. OTHER BUSINESS

1. GVS&DD Board Committee Information Items and Delegation Summaries

J. RESOLUTION TO CLOSE MEETING

It was MOVED and SECONDED

That the GVS&DD Board close its meeting scheduled for November 1, 2024 pursuant to section 226 (1) (a) of the *Local Government Act* and the *Community Charter* provisions as follows:

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

- (e) the acquisition, disposition or expropriation of land or improvements, if the council considers that disclosure could reasonably be expected to harm the interests of the municipality;
- (g) litigation or potential litigation affecting the municipality; and
- (k) negotiations and related discussions respecting the proposed provision of a municipal service that are at their preliminary stages and that, in the view of the council, could reasonably be expected to harm the interests of the municipality if they were held in public.

CARRIED

K. ADJOURNMENT

It was MOVED and SECONDED

That the GVS&DD Board adjourn its meeting of November 1, 2024.

CARRIED

(Time: 10:25 am)

CERTIFIED CORRECT

Dorothy Shermer, Corporate Officer

Mike Hurley, Chair

71593138

To: Zero Waste Committee

From: Stephanie Liu, Program Manager, Community Engagement, Solid Waste Services

Date: October 24, 2024 Meeting Date: November 7, 2024

Subject: **Solid Waste Management Plan Independent Consultation and Engagement Panel Updated Terms of Reference**

RECOMMENDATION

That the GVS&DD Board receive for information the updated Terms of Reference for the Solid Waste Management Plan Independent Consultation and Engagement Panel as presented in Attachment 1 of the report dated October 24, 2024 titled, "Solid Waste Management Plan Independent Consultation and Engagement Panel Updated Terms of Reference".

EXECUTIVE SUMMARY

The Solid Waste Management Plan Independent Consultation and Engagement Panel (Engagement Panel) provides advice on engagement related to the development of an updated solid waste management plan. The Terms of Reference for the Engagement Panel were originally received by the Board in 2020. This report provides an updated Terms of Reference including:

- Approval of new Engagement Panel members by the GVS&DD Board
- New Engagement Panel members to reside within the Metro Vancouver region to facilitate attendance at in-person meetings
- Addition of new members will follow a publicly promoted application process
- Board determines the number of Engagement Panel members

The updated Terms of Reference are being presented to the Zero Waste Committee and GVS&DD Board for information prior to launching a recruitment process to add new members to the Engagement Panel.

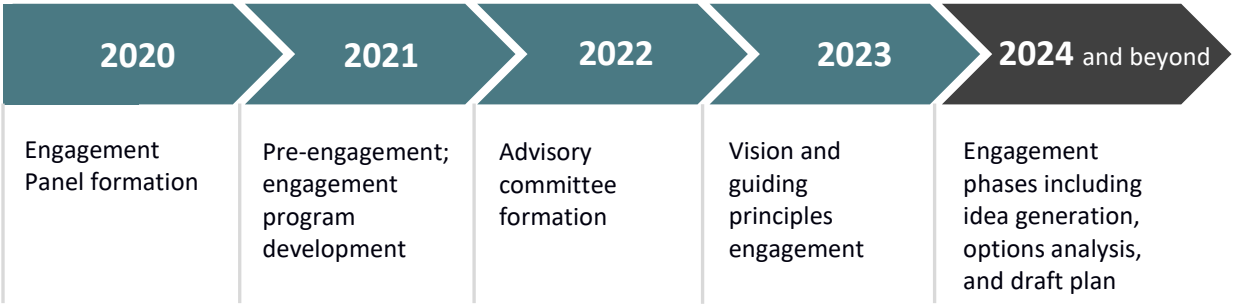
PURPOSE

The purpose of this report is to provide the Board with an updated Engagement Panel Terms of Reference.

BACKGROUND

The Engagement Panel, established in 2020, acts as an independent, third party consisting of engagement experts who provide advice on the development and implementation of a robust and inclusive engagement process for the solid waste management plan update. The Engagement Panel acts as a public advisory committee, falling under the Board's Public Advisory Committee policy. Its establishment is a measure that goes beyond provincial requirements for engagement on an updated solid waste management plan, to ensure a comprehensive and inclusive engagement process. In May 2023, the Zero Waste Committee received a report with details about the Engagement Panel's role, membership, and timeline.

The Engagement Panel has advised staff and provided comments to the Board in each phase of engagement on the plan update thus far. Most recently, in June 2024, the GVS&DD Board received a report on the solid waste management plan vision and guiding principles phase of engagement, which included a section containing reflections and observations from the Engagement Panel. The Engagement Panel continues to provide input on the design and implementation of the current phase of engagement: idea generation.



In advance of an upcoming recruitment process for potential new Engagement Panel members, the Engagement Panel Terms of Reference have been updated. The current Terms of Reference were received for information by the Board in June 2020.

UPDATED TERMS OF REFERENCE

The updated Engagement Panel Terms of Reference are included as Attachment 1. Key provisions include:

- Approval of any new Engagement Panel members by the GS&DD Board
- Any new Engagement Panel members must reside within the Metro Vancouver region to facilitate attendance at in-person meetings
- Addition of new members will follow a publicly promoted application process
- Board determines the number of Engagement Panel members
- Engagement Panel members are expected to participate for the duration of the solid waste management plan update process, and members wishing to resign will provide written notice to the Engagement Panel Chair

The Engagement Panel has operated effectively to serve its purpose as an independent, third party to provide valuable advice and reflections on the development and implementation of the solid waste management plan update engagement phases thus far. The updated Terms of Reference further strengthen the ability of the Engagement Panel to support the development of an updated solid waste management plan.

The updated Terms of Reference are being presented to the Zero Waste Committee and GVS&DD Board for information prior to launching a recruitment process to add new members to the Engagement Panel.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Activities related to planning and implementing engagement on the update to the solid waste management plan, including funding for the Engagement Panel, are covered under the approved Solid Waste Services budget. Engagement Panel members are compensated on a per meeting basis, with the Chair receiving an additional monthly payment equivalent to one meeting fee for routine business of the Engagement Panel.

CONCLUSION

The Engagement Panel convened in 2020 and will continue to provide engagement advice during the solid waste management plan update process. Updates to the Terms of Reference allow the GVS&DD Board the ability to approve new members, and would require any new members to reside within the Metro Vancouver region. This update has been made in preparation for a recruitment process for additional Engagement Panel members in the near future.

ATTACHMENTS

1. Updated Solid Waste Management Plan Consultation and Engagement Panel Terms of Reference

REFERENCES

1. Solid Waste Management Plan Consultation and Engagement Panel Current Member Biographies

70641244

Solid Waste Management Plan Independent Consultation and Engagement Panel

Terms of Reference
November 29, 2024

PURPOSE

The Solid Waste Management Plan Independent Consultation and Engagement Panel (Consultation and Engagement Panel) was established to act as an independent, third party to provide advice and recommendations to staff and the Zero Waste Committee and GVS&DD Board on issues related to engagement on the development of an updated solid waste management plan. It acts as a public advisory committee, falling under the Board's Public Advisory Committee policy.

SCOPE OF WORK

At its November 15, 2019 Board meeting, the GVS&DD Board adopted the following resolution:

> *a) authorize initiating an update of the regional solid waste management plan; and*
> *b) direct staff to notify the public and First Nations of its intention to review the plan and bring an engagement plan to the Board in early 2020 in advance of initiating consultation on the plan update.*

The Consultation and Engagement Panel advises on the development and implementation of the engagement plan. The Consultation and Engagement Panel advises staff and reports out to the Board on engagement during all phases of the solid waste management plan development to ensure consultation is robust and adequate, and feedback is solicited from a variety of interested parties and stakeholders.

MEMBERSHIP

Membership on the Consultation and Engagement Panel consists of external representatives with extensive experience in engagement and representing a diverse range of regional perspectives. Any new members approved to join the Consultation and Engagement Panel must reside within the Metro Vancouver region to facilitate attendance at occasional in-person meetings.

Any new Consultation and Engagement Panel members will be selected through an application process, and calls for application will be promoted publicly. Candidates for appointment to the Consultation and Engagement Panel will be considered by the Zero Waste Committee based on their skill set and experience in engagement on large public planning processes. New members will be approved by the GVS&DD Board in a closed meeting.

The Zero Waste Committee Chair will act as a liaison to the Consultation and Engagement Panel and will attend meetings. Others may be permitted to attend Consultation and Engagement Panel meetings in an observer or advisory role, if expressly invited or authorized to attend by the Consultation and Engagement Panel.

The Board Chair will designate a Consultation and Engagement Panel Chair. The Consultation and Engagement Panel Chair is the chief spokesperson on matters of public interest within the Consultation and Engagement Panel's purview. For high profile issues, the role of spokesperson rests with the Metro Vancouver Board Chair or Vice-Chair. On technical matters or in cases where an initiative is still at the staff proposal level, a senior staff member is the appropriate chief spokesperson.

Members of the Consultation and Engagement Panel are expected to participate for the duration of the solid waste management plan update process. Members wishing to resign from the Consultation and Engagement Panel should provide written notice, including the effective date of their resignation, addressed to the Consultation and Engagement Panel Chair.

MEETINGS

The Consultation and Engagement Panel will meet throughout the term, as required. The Consultation and Engagement Panel advises staff on a regular basis and reports to the Board on its findings including any recommendations on proposed changes to the engagement plan or its implementation. Consultation and Engagement Panel members may also attend and observe engagement events. Consultation and Engagement Panel members submit reports for each step of the engagement process, reflecting on the adequacy of the engagement.

Metro Vancouver staff provide research, writing, and administrative support to the Consultation and Engagement Panel.

Consultation and Engagement Panel meetings are held virtually or at Metro Vancouver offices located at 4515 Central Boulevard in Burnaby, British Columbia. If unable to attend a meeting in person, a member may participate via videoconference, teleconference, or other electronic means.

Records and information associated with the Consultation and Engagement Panel's efforts are considered confidential, and members will hold them in confidence, until such time that the records and information are released.

MANAGEMENT AND SUPPORT

Metro Vancouver's Program Manager of Solid Waste Community Engagement serves as manager for the Consultation and Engagement Panel. In that capacity, the manager is responsible for coordinating agendas and is the principal point of contact for members.

Staff from Metro Vancouver's Solid Waste Services Department track key action items and provide record-keeping services, as well as provide procedural advice at the meetings, as required.

COMPENSATION AND EXPENSES

Independent Consultation and Engagement Panel members are compensated on a per-meeting basis and for reasonable travel expenses. The Consultation and Engagement Panel Chair also receives a monthly payment equivalent to the remuneration received by a Consultation and Engagement Panel member for one meeting for conducting routine business of the Consultation and Engagement Panel.

Funding for the Consultation and Engagement Panel is provided under Metro Vancouver's Solid Waste Services function to cover compensation, meeting expenses, and travel costs or incidentals, consistent with Metro Vancouver’s Travel and Business Expenses Policy.

To: Liquid Waste Committee

From: Kris Etches, Community Engagement Program Manager, External Relations

Date: November 5, 2024 Meeting Date: November 13, 2024

Subject: **Liquid Waste Management Plan Phase 2 Engagement**

RECOMMENDATION

That the GVS&DD Board receive for information the report dated November 5, 2024, titled "Liquid Waste Management Plan Phase 2 Engagement."

EXECUTIVE SUMMARY

During the second phase of engagement on the Liquid Waste Management Plan review and update, Metro Vancouver worked with member jurisdictions to develop draft goals, strategies, and actions for the next plan. Metro Vancouver sought input from First Nations, the public, and a public advisory committee. First Nations expressed strong interest in regional and municipal actions that result in measurable water quality improvements (including a return to shellfish harvesting), actions to address stormwater pollutants and their impact on marine life, and access to detailed water quality data online. Comments received from the public and public advisory committee focused on reducing the quantity of wastewater and its contaminants at the source, capital project cost increases, and desire for expanded green infrastructure to manage rainwater. Staff will initiate the final phase of engagement following Board endorsement of the draft plan.

PURPOSE

To provide the Board with the results of the second phase of engagement on the Liquid Waste Management Plan review and update and to provide the process for the third and final phase of engagement on the draft plan.

BACKGROUND

Engagement on the review and update of the Liquid Waste Management Plan began in 2021, following approval of an engagement strategy by the Greater Vancouver Sewerage and Drainage District (GVS&DD) Board on October 2, 2020 and by the Ministry of Environment and Climate Change Strategy on March 26, 2021.

In the first phase of the engagement process, the updated plan's vision and guiding principles were developed and summarized for the April 13, 2022 GVS&DD Board meeting. In the second phase of engagement (May 2022 to December 2024), draft goals, strategies, and actions for the updated plan were developed in collaboration with GVS&DD member jurisdictions. Metro Vancouver engaged on draft strategies and actions with First Nations, the public, and other interested parties, including a public advisory committee, receiving and incorporating input on the content for the draft plan. A third and final engagement phase will follow in 2025, where staff will engage with First Nations, the public advisory committee, and the public on the GVS&DD Board-endorsed draft plan.

PHASE 2 ENGAGEMENT PROCESS AND RESULTS

An overview of key engagement feedback heard from First Nations and external groups throughout the second phase of engagement is provided below. Actions that were co-developed with GVS&DD member jurisdictions are included in the report dated October 25, 2024, titled "Endorsement of the Interim Draft Liquid Waste Management Plan."

Ministry of Environment and Climate Change Strategy

Staff met with representatives from the Ministry of Environment and Climate Change Strategy at least quarterly during the development of draft goals, strategies, and actions for the next plan. Additional meetings were scheduled as needed. Staff provided regular updates on First Nations engagement and input at these meetings, along with an interim First Nations Phase 2 engagement report in May 2024, as requested by the ministry.

The ministry is seeking an actionable plan that will result in better environmental outcomes. Meaningful First Nations engagement will be critical to the success and approval of the draft plan, and the ministry will conduct its own consultation with First Nations on the proposed plan update as part of its duty to consult. Meaningful engagement with First Nations and incorporation of their perspectives and input will result in an improved plan and will be integral to First Nations expressing support for the plan during the formal provincial consultation.

First Nations

Thirty-three First Nations, a Tribal Council, and Treaty Association with interests in the Metro Vancouver region, as well as the Métis Nation of British Columbia, have been invited to engage on the Liquid Waste Management Plan update. Metro Vancouver has been providing them with regular updates on engagement opportunities and project milestones. The 10 local First Nations are noted in bold below.

- Cowichan Tribes
- Douglas Band (Xa'xtsa)
- Halalt First Nation
- **q̓iċəy̓ (Katzie First Nation)**
- **q̓ʷɑ:ṅƛ̓əṅ (Kwantlen First Nation)**
- **kʷikʷəƛ̓əm (Kwikwetlem First Nation)**
- Lake Cowichan First Nation
- Lyackson First Nation
- **máthxwi (Matsqui First Nation)**
- Métis Nation of British Columbia
- **xʷməθkʷəy̓əm (Musqueam Indian Band)**
- Pauquachin First Nation
- Penelakut Tribe
- Peters First Nation
- **qiqéyt (Qayqayt First Nation)**
- Samahquam First Nation
- Seabird Island Band
- **Semiahmoo First Nation**
- Shxw'ow'hamel First Nation
- Skatin Nations
- Skawahlook First Nation
- Snaw-Naw-As First Nation
- Snuneymuxw First Nation
- Soowahlie First Nation
- **Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)**
- Stó:lō Nation
- Stó:lō Tribal Council
- Stz'uminus First Nation
- Te'mexw Treaty Association
- Tsartlip First Nation
- Tsawout First Nation
- **scəw̓aθən məsteyəxʷ (Tsawwassen First Nation)**
- Tseycum First Nation
- **səlilwətaɬ (Tsleil-Waututh Nation)**

Metro Vancouver has tailored the engagement process with individual First Nations based on their level of interest and capacity. Engagement has taken place through one-on-one meetings and three technical workshops held in 2022 and 2023. To date, Metro Vancouver has had one-on-one meetings with six local First Nations on the plan: q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation), kʷikʷəƛ̓əm (Kwikwetlem First Nation), Semiahmoo First Nation, Sḵwx̱wú7mesh Úxwumixw (Squamish Nation), scəẇaθən məsteyəxʷ (Tsawwassen First Nation), and səlilwətaɬ (Tsleil-Waututh Nation). The three technical workshops brought together member jurisdictions, representatives from the Ministry of Environment and Climate Change Strategy, First Nations, and the public advisory committee to discuss key focus areas within the scope of the plan, and to hear priorities and perspectives from one another.

Key themes heard from First Nations include the desire for:

- More substantial decision-making authority on regional and municipal projects and plans
- Regional and municipal actions that result in measurable water quality improvements and a return to shellfish harvesting
- A more coordinated and strategic engagement process with municipalities and Metro Vancouver because First Nations find they are providing similar feedback across projects, often with limited implementation
- Access to detailed water quality data online
- Actions to address stormwater pollutants and their impact on marine life, a key area of concern

First Nations engagement has provided valuable contributions to the update of the plan. The comments and questions raised during engagement and Metro Vancouver's responses appear in Attachment 1: First Nations Feedback – Comment/Response Table.

Liquid Waste Management Plan Public Advisory Committee

Formed in 2021 to provide expert knowledge and relevant experience to inform the update of the plan, the public advisory committee comprises nine members from environmental organizations, academia, business, and technical fields. Throughout 13 meetings held across the first and second phases of engagement, the public advisory committee provided feedback on focus areas within the scope of the plan and developed a set of 13 recommendations for the plan to address.

In brief, the recommendations developed by the public advisory committee asked members and Metro Vancouver to take action to:

- Reduce the quantity of wastewater and its contaminants at the source
- Prevent pollution in rainwater runoff and wastewater
- Strengthen knowledge of local water quality and the effects of emerging and traditional pollutants

The public advisory committee's recommendations are included as Attachment 2: Liquid Waste Management Plan Public Advisory Committee Recommendations.

Public
The public was engaged on the focus areas within the scope of the plan update using the following approaches throughout June and July 2024:

- Online survey June 13 to July 15, resulting in 400 respondents (*Note that survey respondents were self-selected so the survey is not considered statistically representative of opinions across the region)
- Webinar on June 26 with 33 participants
- Booths at two public events (the Water and Environment Student Talks Conference at UBC on June 13, and the Pacific Concord Dragon Boat Festival on June 22), engaging with more than 330 participants
- Workshops with students and teachers taking part in Metro Vancouver's Youth and Education Advisory Panel (November 2023 and April 2024) and Youth4Action Program (March 2024)

The following outreach and promotion tools were used to raise general public awareness about the plan update, provide project updates, and encourage participation in public engagement opportunities:

- Promoted social media posts reached 48,699 residents, and gained over 158,308 impressions (number of times viewed) and 1,425 likes, comments, and shares
- Digital newspaper ads received an estimated 178,990 impressions
- Three emails sent to the Liquid Waste Management Plan project subscriber list of 872 subscribers
- Notice about the public survey and webinar included in two wastewater treatment plant construction e-newsletters, and the Metro Vancouver Update and Chair Update e-newsletters

Key themes from public engagement included:

- Concerns about project cost increases and wastewater treatment plant project oversight
- Suggestions that cost apportionment for major projects should be spread across the region
- Desire for higher levels of wastewater treatment while also wanting lower costs
- Concern about stormwater pollutants and interest in innovative stormwater management, including high support for green infrastructure
- Comments urging for accelerated sewer separation
- Support for water metering/water conservation

A comprehensive summary of the second phase of public engagement activities and results appear in Attachment 3: Phase 2 Public Engagement Summary. The comments and questions raised by the public during engagement and Metro Vancouver's responses appear in Attachment 4: Public Feedback – Comment/Response Table.

PHASE 3 – ENGAGING ON THE DRAFT PLAN
Following endorsement of the draft Liquid Waste Management Plan from the Liquid Waste Committee and GVS&DD Board, staff will begin the third and final phase of engagement on the

draft plan. A framework for the third phase of engagement appears in Attachment 5: Phase 3 Engagement Strategy.

Staff will engage on the draft plan through a comment period, inviting First Nations, the public advisory committee, and the public to provide feedback using multiple approaches, including written feedback, one-on-one meetings, and an online survey and webinar. The draft plan will also be presented to all GVS&DD member councils for review and endorsement during this time.

Staff will revise the draft plan based on feedback received in the third phase of engagement. The draft Liquid Waste Management Plan will come to the Liquid Waste Committee and GVS&DD Board for approval, along with a final engagement report, at the end of the third phase. Metro Vancouver will then submit the Liquid Waste Management Plan and final engagement report to the ministry for its consideration and approval.

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

FINANCIAL IMPLICATIONS
There are no financial implications.

CONCLUSION
Metro Vancouver staff have collaborated with member jurisdictions and engaged with First Nations, the public advisory committee, and members of the public throughout the second phase of engagement on the Liquid Waste Management Plan. Staff have considered the feedback and used it to inform the development of the draft updates to the Liquid Waste Management Plan that is before the Liquid Waste Committee for consideration and input. Metro Vancouver will continue to engage with these groups throughout a third and final phase of engagement, prior to submission of the updated plan to the Ministry of Environment and Climate Change Strategy for its consideration and approval.

ATTACHMENTS
1. First Nations Feedback – Comment/Response Table
2. Liquid Waste Management Plan Public Advisory Committee Recommendations
3. Phase 2 Public Engagement Summary
4. Public Feedback – Comment/Response Table
5. Phase 3 Engagement Strategy
6. Drafting the Liquid Waste Management Plan Phase 2 Engagement Overview Presentation

REFERENCE
1. Liquid Waste Management Plan Review and Update – Report on Phase 1

70422816

Integrated Liquid Waste and Resource Management Plan - Review and Update

First Nations Feedback / Response Table - Phase 2

ID	Source/ Material	Organization/Group	Date	Comments/Information Requests	Action/Commitment
1	Technical Workshop #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jul 6, 2022	Comment: Protection of Indigenous values needs to be included in this plan explicitly, in goals and strategies.	The Liquid Waste Management Plan (LWMP) seeks to honour the Board's commitment to reconciliation with Indigenous Peoples and includes a proposed goal about collaborating with First Nations in regional liquid waste management: *First Nations are actively involved in regional liquid waste management. Strategies and solutions reflect First Nations' priorities and respect Indigenous Knowledge and the Rights of Indigenous Peoples while collaborating on areas of shared significance.* The strategies and solutions in the plan reflect key themes heard during engagement with First Nations. Metro Vancouver aspires to reflect First Nations' priorities, incorporate Indigenous Knowledge, and prioritize collaborating on areas of shared significance. The Plan: • Acknowledges that liquid waste management has impacts on First Nations communities and lands • Outlines a commitment to work with First Nations to increase their influence on the projects and plans that affect their rights and interests • Recognizes First Nations have an important role in stewardship of the region's land, water, and air • Seeks to incorporate Indigenous Knowledge and actively involve First Nations in regional liquid waste management
2	Technical Workshop #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jul 6, 2022	Comments and questions shared with the room: Issues I see are — need for volume reductions at the source, more efficient systems, grey water reuse. Also what about rental properties and places where individuals don't have control over the pipes in their residences. And where are the hotspots of problems — private residences? Industries? Institutions? Also, when it comes to carrots, how do we ensure that what is implemented benefits everyone, not only the wealthy?	The following proposed LWMP actions incorporate this feedback in the areas of growth and urban development, more efficient systems, encouraging volume reductions as the source, and acting to reduce inflow and infiltration: 1.1, 1.2, 3.1, 3.2, 3.3, 3.5, 5.1, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3, 6.4, 9.1, 9.2, 9.3, 9.4, 9.6, 10.5 While the actions above do not explicitly deal with ensuring that benefits are for everyone, not just the wealthy, they are actions for Metro Vancouver and members that aim to address the issue of inflow and infiltration across the regional and municipal wastewater system, benefitting all, and not just some. Outside of the LWMP, Metro Vancouver supports the concept of greywater use as an important water conservation measure, and has published a Non-Potable Water Systems Guidebook to support greywater use in the region.
3	Technical Workshop #1	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Jul 6, 2022	Comment: We would be interested in further understanding the protocols that are used by municipalities and MV for responding to spills into streams. To date, it seems that these instances are dealt with on an ad hoc basis and there needs to be a more diligent program (as well as funded monitoring programs) in place to identify areas of concern and respond in a timely matter.	For all receiving environments, response to spills is regulated by the *Spill Response Regulations* under the *Environmental Management Act*. Metro Vancouver and members follow these prescribed regulatory requirements following any and all of their spills. The updated LWMP also includes actions for municipalities to monitor watershed health in their jurisdictions using criteria co-developed with interested First Nations (proposed actions 10.1 and 10.2).
4	Technical Workshop #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jul 6, 2022	Comment: We are writing to the Ministry of Environment and Climate Change Canada suggesting that they request to be included in this engagement process as there are related analyses going on at the federal level.	As the federal government regulates pollutants and the protection of species at risk, as well as fish population and habitats in receiving waters and urban streams, Metro Vancouver would welcome Department of Environment and Climate Change Canada involvement as part of the LWMP update.
5	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Re. Combined Sewer Overflow (CSO) Elimination And Sewer Separation: Goals Protect Aboriginal rights and title and Indigenous values (this should be a goal throughout all aspects of the process). Indigenous values need to be front and centre in this process and its associated documents, and not buried within the text, or an afterthought.	The Liquid Waste Management Plan (LWMP) seeks to honour the Board's commitment to reconciliation with Indigenous Peoples and includes a proposed goal about collaborating with First Nations in regional liquid waste management: First Nations are actively involved in regional liquid waste management. Strategies and solutions reflect First Nations' priorities and respect Indigenous Knowledge and the Rights of Indigenous Peoples while collaborating on areas of shared significance. The strategies and solutions in the plan reflect key themes heard during engagement with First Nations. Metro Vancouver aspires to reflect First Nations' priorities, incorporate Indigenous Knowledge, and prioritize collaborating on areas of shared significance. The Plan: • Acknowledges that liquid waste management has impacts on First Nations communities and lands • Outlines a commitment to work with First Nations to increase their influence on the projects and plans that affect their rights and interests • Recognizes First Nations have an important role in stewardship of the region's land, water, and air • Seeks to incorporate Indigenous Knowledge and actively involve First Nations in regional liquid waste management

6	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Re. Combined Sewer Overflow (CSO) and Sanitary Sewer Overflow (SSO): Approach: "Public and Indigenous expectations ... have increased..."Indigenous expectations have always been high, but the colonial system has not considered or addressed Indigenous values, which has resulted in the situation we are currently facing with poor water quality affecting values and creating food insecurity and an inability for Indigenous people to safely partake in activities that they had undertaken since time immemorial.In general, Indigenous values should never be lumped in with public opinion.	Metro Vancouver recognizes that the colonial system has not heard, considered, or addressed Indigenous values in a fair and equitable way. Metro Vancouver strives to collaborate meaningfully with First Nations to ensure that moving forward, First Nations values are well-incorporated into plans and projects. Metro Vancouver understands that as rights and title-holders, First Nations must have a government-to-government engagement process, seperate from public engagement. The Liquid Waste Management Plan (LWMP) seeks to honour the Board's commitment to reconciliation with Indigenous Peoples and includes a proposed goal about collaborating with First Nations in regional liquid waste management: First Nations are actively involved in regional liquid waste management. Strategies and solutions reflect First Nations' priorities and respect Indigenous Knowledge and the Rights of Indigenous Peoples while collaborating on areas of shared significance.The strategies and solutions in the plan reflect key themes heard during engagement with First Nations. Metro Vancouver aspires to reflect First Nations' priorities, incorporate Indigenous Knowledge, and prioritize collaborating on areas of shared significance. The Plan:• Acknowledges that liquid waste management has impacts on First Nations communities and lands• Outlines a commitment to work with First Nations to increase their influence on the projects and plans that affect their rights and interests• Recognizes First Nations have an important role in stewardship of the region's land, water, and air• Seeks to incorporate Indigenous Knowledge and actively involve First Nations in regional liquid waste management
7	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Re. "real time reporting…" Appears that all SSOs and CSOs are not yet integrated into the alerts system?	Metro Vancouver commits to continue posting real-time information on SSOs and CSOs: Proposed Action 7.1 (SSOs) and Action 8.1 (CSOs). However, these are actions for Metro Vancouver only, not members. This is because some members have logistical issues preventing the installation of monitors at some sites. However, new in this LWMP, proposed action 8.3 requires members with combined systems to begin to monitor CSO flows and characterize samples from CSO discharges. Also, proposed action 8.4 requires members with combined systems to report on CSOs: a) Members with combined systems will continue to estimate and report annually on the frequency, location and volume of CSOs from municipal sewers, and where feasible identify and address the probable causes. b) Members with combined systems will begin reporting CSO flow monitoring and characterization and assessment of environmental impacts, or pursue an alternate approach approved by the Ministry of Environment. A new performance indicator, 8A, will report on the total number and volume (m3) of CSOs for entire system; and number, frequency, and volume (m3) of CSOs at each overflow site for members and Metro Vancouver.
8	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	"Smaller scale investments" Like flow reductions? Efficiency measures to integrate into households?	"Smaller scale investments" in this case refers to identifying localized actions, often within the private system, such as private side sewer separation to free up capacity in the sewer system. This is in contrast to major capital upgrades such as wastewater treatment plant capacity upgrades, which are much costlier. The following proposed actions are generally what would be considered smaller scale: 3.1, 3.2, 3.3, 5.1, 5.2, 5.4, 5.5, 9.1
9	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Need to be informed by the values underpinning the Burrard Inlet Water Quality Objectives, and the objectives themselves. For example also need to meet the goals to protect the value of shellfish consumption, and the timelines associated with the microbiological indicators objectives. Approach should also integrate reductions associated with the other contaminants in CSOs.	The Burrard Inlet Water Quality Objectives (and other objectives for other water bodies which may be developed in the future) will inform approaches to CSO management that have been integrated into the new plan's actions. The following proposed actions incorporate and/or address this feedback: 7.1, 7.2, 7.3, 7.4, 7.5, 8.1. 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.9, 10.1, 10.2, 10.4, 10.5, 13.3, 19.3, 20.2 We will aim to add a description to the LWMP of səlilwətaɬ's work on the BIWQOs and how Metro Vancouver is using the objectives. We would like to work with səlilwətaɬ on to develop this content (whether it is added as a 'call-out box' or in some other form).

10	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Indigenous values must be included, can't be limited to "could include."	The Liquid Waste Management Plan (LWMP) seeks to honour the Board's commitment to reconciliation with Indigenous Peoples and includes a proposed goal about collaborating with First Nations in regional liquid waste management: First Nations are actively involved in regional liquid waste management. Strategies and solutions reflect First Nations' priorities and respect Indigenous Knowledge and the Rights of Indigenous Peoples while collaborating on areas of shared significance.The strategies and solutions in the plan reflect key themes heard during engagement with First Nations. Metro Vancouver aspires to reflect First Nations' priorities, incorporate Indigenous Knowledge, and prioritize collaborating on areas of shared significance. The Plan:• Acknowledges that liquid waste management has impacts on First Nations communities and lands• Outlines a commitment to work with First Nations to increase their influence on the projects and plans that affect their rights and interests• Recognizes First Nations have an important role in stewardship of the region's land, water, and air• Seeks to incorporate Indigenous Knowledge and actively involve First Nations in regional liquid waste managementIn addition, there are proposed actions across the plan that aim to include Indigenous values in areas across the scope of the LWMP, such as: 1.3, 4.2, 9.2, 10.2
11	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Re. "How might we improve" Regular monitoring of all associated contaminants, and public reporting. This will help identify hotspots. Need subsequent remediation.	The following proposed actions incorporate or/address this feedback: 7.1, 7.2, 7.3, 7.4, 7.5, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 13.3, 19.3, 20.2. In addition, regular environmental monitoring is already taking place and information is publicly available (see Strategies 19, and 20, and the Environmental Management and Quality Control Annual Reports posted here: https://metrovancouver.org/services/liquid-waste/reports-and-resources). Note that proposed Action 8.1 (on CSOs) requires mandatory real-time monitoring by Metro Vancouver but not by members due to logistical issues preventing installation at some member sites. However, new in this LWMP, Action 8.3 requires members with combined systems to begin to monitor CSO flows and characterize samples from CSO discharges. A new performance indicator, 8A, will report on the total number and volume (m3) of CSOs for entire system; and number, frequency, and volume (m3) of CSOs at each overflow site for members and Metro Vancouver.
12	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Metrics: Water quality measurements at outfalls and ambient, and compare to water quality objectives. Understand and address why overflows happen in dry weather. Reporting in ways relevant to Indigenous Nations: Engaging in direct conversations from the outset, identification and integration of Indigenous values from the outset of the work and reporting against those values, maintaining consistency with existing work by Indigenous Nations.	The following proposed actions incorporate and/or address water quality monitoring at outfalls or receiving environments, reporting on SSOs/CSOs, plans for mitigation of SSOs/CSOs, and implementation of system optimization projects to reduce SSOs/CSOs: 7.3, 7.4, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 19.2, 19.3 Proposed Actions 7.1 and 8.1 (real-time monitoring for SSOs and CSOs, respectively) require mandatory real time monitoring by Metro Vancouver but not by members due to logistical issues preventing installation at some members sites. In addition, the following actions commit to working with First Nations on identifying Indigenous values at the outset (1.3, 9.2, 10.2) and reporting against those values (9.2, 10.2)
13	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Re. "During wet weather…" Are SSOs always released in these ways or are there also outfalls?	Most sanitary sewer overflows occur during wet weather due to leaks and improper storm connections to the sanitary system. Dry weather sanitary sewer overflows might occur due to infrastructure failure. For example, sewer blockages due to fats, oils, and grease, failure of back-up systems, or broken pipes. The following proposed action aims to address infrastructure maintenance to help reduce dry weather SSOs: 1.1

14	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Protect Aboriginal rights and title and Indigenous values (this should be a goal throughout all aspects of the process). Indigenous values need to be front and centre in this process and its associated documents, and not buried within the text, or an afterthought.	The Liquid Waste Management Plan (LWMP) seeks to honour the Board's commitment to reconciliation with Indigenous Peoples and includes a proposed goal about collaborating with First Nations in regional liquid waste management: First Nations are actively involved in regional liquid waste management. Strategies and solutions reflect First Nations' priorities and respect Indigenous Knowledge and the Rights of Indigenous Peoples while collaborating on areas of shared significance. The strategies and solutions in the plan reflect key themes heard during engagement with First Nations. Metro Vancouver aspires to reflect First Nations' priorities, incorporate Indigenous Knowledge, and prioritize collaborating on areas of shared significance. The Plan: • Acknowledges that liquid waste management has impacts on First Nations communities and lands • Outlines a commitment to work with First Nations to increase their influence on the projects and plans that affect their rights and interests • Recognizes First Nations have an important role in stewardship of the region's land, water, and air • Seeks to incorporate Indigenous Knowledge and actively involve First Nations in regional liquid waste management
15	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Must also include Indigenous Nations (which are also governments) and alignment with Indigenous priorities.	The following proposed actions commit to working with First Nations across a range of issues to reflect and incorporate Indigenous values into projects and plans: 1.3, 9.2, 10.2. 13.4
16	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	To improve alignment, need consistency with and integration of Indigenous values.	Metro Vancouver will continue to meet with səlilwətaɬ (Tsleil-Waututh Nation) to work to understand and meaningfully integrate their values into not only the LWMP, but Metro Vancouver plans and projects outside of the LWMP. The following proposed actions commit to working with First Nations across a range of issues in order to reflect and incorporate Indigenous values into projects and plans: 1.3, 9.2, 10.2. 13.4
17	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Volume reductions at the source; more efficient systems; grey water reuse	The following proposed actions incorporate and/or address this feedback: 1.2, 3.1, 3.2, 3.3, 3.5, 5.1, 5,2, 5.3, 5.4, 5.5, 6.4, 9.1, 9.6 Outside of the LWMP, Metro Vancouver supports the concept of greywater use as an important water conservation measure, and has published a Non-Potable Water Systems Guidebook to support greywater use in the region.
18	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	What about rental properties?	The following proposed actions are aimed at property owners (including rental property owners): 1.1, 1.2, 3.1, 3.2, 3.3, 3.5, 5.1, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3, 6.4, 9.1, 9.2, 9.3, 9.4, 9.6, 10.5 In the case of renters, education campaigns on flow and pollutant reductions at the source will be the most likely approach to reach this audience. Proposed actions include: 3.1, 3.5, 4.2

19	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Where are the hotspots or most problematic areas?	Proposed LWMP actions to address hotspots or particularly problematic CSOs include: 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 9.2 The relative sizes of MV's CSOs (note that three members also have CSOs) are noted in the latest biennial report, p.86, https://metrovancouver.org/services/liquid-waste/Documents/lwmp-biennial-report-volume-1-2023.pdf#search=biennial
20	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Be clear on what power the public has to reduce I&I.	The responsibility of private property owners to address excessive I&I is addressed in the new plan. Municipal powers exercised through their private side bylaws will also increase corrective actions by owners. One of the key actions is for an education campaign to outline actions everyone can take to reduce I&I (e.g. downspout disconnection, planting rain gardens, reducing impermeable surfaces on property) or help with rainwater management and water quality (e.g. using eco-friendly car wash, protecting riparian areas, planting trees, shrubs, and plants). Proposed actions that incorporate and/or address this feedback include: 5.1, 5.2, 5.3, 5.4, 5.5
21	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Compare against Burrard Inlet Water Quality Objectives. Also, integrate Indigenous values from the outset and compare against those.	All of Metro Vancouver's Receiving Environment Monitoring Programs (REM) for Burrard Inlet include an evaluation of attainment of BIWQOs. If a particular program has been in place for a number of years, periodic program reviews include temporal evaluation of attainment of the objectives in the context of discharges from the Metro Vancouver liquid waste management system. If a statistically significant increasing concentration trend is observed, Metro Vancouver looks at actions that may be implemented to address it, which include modifications of wastewater treatment plant processes or appropriate source control actions.Metro Vancouver's Burrard Inlet REM programs are designed to evaluate attainment of BIWQOs, and will continue to do so with the updated BIWQOs developed by the Province and səlilwətaɬ.Action 20.2 commits Metro Vancouver to continue to participate in the BC Ministry of Environment and Climate Change Strategy's processes to review and establish water quality objectives.We will aim to add a description to the LWMP of səlilwətaɬ's work on the BIWQOs and how Metro Vancouver is using the objectives. We would like to work with səlilwətaɬ on to develop this content (whether it is added as a 'call-out box' or in some other form).
22	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	Additionally, we request that your team integrate səlilwətaɬ (Tsleil-Waututh Nation)'s values as articulated through the following documents as a minimum. a) səlilwətaɬ (Tsleil-Waututh Nation)'s Assessment of the Trans Mountain Pipeline and Tanker Expansion Proposal. Although this document was proposed for a particular federal project, its content is relevant to any planned projects in and around Burrard Inlet. b) səlilwətaɬ (Tsleil-Waututh Nation)'s Stewardship Policy c) The Burrard Inlet Water Quality Objectives, including the following: i. Activities that will support attainment of the Water Quality Objectives ii. Adherence to the guidance provided within the associated detailed technical reports, which include information on contaminant levels, potential sources and management recommendations d) səlilwətaɬ (Tsleil-Waututh Nation)'s Burrard Inlet Action Plan	Metro Vancouver will take these documents under consideration. In addition, staff have been meeting monthly with səlilwətaɬ (Tsleil-Waututh Nation) on the LWMP since April 2024 to understand səlilwətaɬ (Tsleil-Waututh Nation)'s values as they relate to the LWMP.

23	səlilwətaɬ (Tsleil-Waututh Nation) Wet Weather Management Discussion Papers Feedback Table	səlilwətaɬ (Tsleil-Waututh Nation)	Aug 10, 2022	səlilwətaɬ (Tsleil-Waututh Nation) (səlilwətaɬ (Tsleil-Waututh Nation)) is pleased to participate with Metro Vancouver on the development of the Liquid Waste Management Plan, and appreciates being included in the series of meetings related to the discussion papers and other preparatory documents. səlilwətaɬ (Tsleil-Waututh Nation) recognizes this significant opportunity to improve water quality and restore the health of waters within səlilwətaɬ (Tsleil-Waututh Nation)'s consultation area. With that being said, we also have some concerns regarding the process thus far. We are concerned that a Public Advisory Committee has been meeting prior to any meaningful Indigenous engagement in this process. We remind you of the letter sent by səlilwətaɬ (Tsleil-Waututh Nation) CAO Ernie George in 2020, and the subsequent meeting with Jerry Dobrovolny, indicating our interest in co-development of this Plan and meaningful/mutually beneficial consultation. Indigenous engagement and involvement must take place from the outset of the process, especially as Indigenous values are already appearing in these documents.	The Liquid Waste Management Plan is a regulatory document that Metro Vancouver and its member jurisdictions are responsible for developing, implementing, funding, and managing. As such, Metro Vancouver and its members must remain its sole authors. Metro Vancouver seeks to engage meaningfully with First Nations on the Liquid Waste Management Plan by facilitating dialogue and incorporating input into the Plan to the greatest extent possible. Metro Vancouver fully understands that səlilwətaɬ (Tsleil-Waututh Nation) as a government partner and rights-holder is different from the general public when it comes to feedback received. We strive to provide separate opportunities for First Nations to discuss their interests and perspectives. For this reason, Metro Vancouver supported the Nation's interest in deep engagement on the LWMP and have been meeting monthly with səlilwətaɬ (Tsleil-Waututh Nation) on the LWMP update, sharing draft strategies and actions for their input since April 2024.
24	Letter from kʷikʷəƛ̓əm (Kwikwetlem First Nation)	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Aug 24, 2022	Re: Share your Ideas: Metro Vancouver Wet Weather Wastewater Management Workshop Archaeology and Cultural Heritage: The Nation is concerned that infrastructure upgrades will impact registered and undocumented archaeological sites. Please provide additional information on how the LWMP will account for and mitigate potential impacts to the Nation's cultural heritage. Planning should include measures to protect sites impacted by infrastructure under MVRD jurisdiction and related private sewer connections.	This is outside the scope of the LWMP, however, as a standardized practice, Metro Vancouver considers archaeology on all projects and initiatives which involve ground-disturbing works. At a minimum, all Metro Vancouver projects must have: 1) Internal preliminary archaeological review, 2) Chance Find Procedure in place, 3) Training for crews in Chance Find Procedure and artifact identification. Preliminary review is conducted by an archaeologist through Metro Vancouver's Indigenous Relations department. This happens at the earliest stages of project development and considers a range of factors contributing to archaeological potential. For projects where preliminary review shows that archaeological potential is likely to be low, Chance Find Procedure is used, and project teams are provided with training opportunities on the procedure and artifact identification. For projects where preliminary review shows that archaeological potential is likely to be moderate or high, project teams will be supported in procuring an archaeological consultant to provide AOA, AIA, or SAP services, as appropriate. In circumstances where there are known to be particularly sensitive cultural heritage resources, or where the appropriate approach is not immediately clear, project teams are advised to reach out to local First Nations to help develop a mutually-agreeable approach to archaeology for the project. Metro Vancouver works only with archaeological companies who adhere to First Nation Heritage Policies and permitting processes, and are preferred by local First Nations.
25	Letter from kʷikʷəƛ̓əm (Kwikwetlem First Nation)	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Aug 24, 2022	Re: Share your Ideas: Metro Vancouver Wet Weather Wastewater Management Workshop Action Prioritization: Please provide the Nation with more information on how locations for sewer upgrades and monitoring are currently determined and what metrics will be used in the new LWMP for prioritization purposes. kwikwəƛ̓əm requests that MVRD and member municipalities integrate Indigenous interests and priorities into decision-making through the protection and monitoring of cultural and spiritual places, aquatic and terrestrial ecosystems, and species of particular importance to the Nation.	Prioritization of actions taken by Metro Vancouver takes into account impacts to human health and the environment. This includes expected frequency of events that could affect human or environmental health, number of people that could be affected, likelihood of public exposure, sensitivity of receiving environment (aquatic and terrestrial flora and fauna), and efficacy of possible mitigation measures. Requirements for activities that have the potential to disturb soil in areas of archeological potential or sensitive ecosystems is assessed for each project based on input from a number of sources, including First Nations. The following proposed actions incorporate or address this feedback: 1.1, 1.3, 2.2, 6.3, 7.3, 7.4, 8.2, 8.3, 8.4, 8.5, 8.7, 9.2, 9.3, 9.4, 13.3, 13.4,

26	Letter from kʷikʷəƛ̓əm (Kwikwetlem First Nation)	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Aug 24, 2022	Re: Share your Ideas: Metro Vancouver Wet Weather Wastewater Management WorkshopPercentage of Separated Sewers: During the LWMP: Wet Weather Management Meeting on July 6th, 2022, it was mentioned that the majority of wastewater systems under MVRD jurisdiction are separated; however, Vancouver Coastal Health partially blames annual e-coli closures on stormwater runoff (see here). Please explain why e-coli levels seem to be increasing despite the number of combined sewer systems declining over the last 40 years.Further, page 4 of the Wet Weather and Sanitary Sewage Discussion Paper states that, "Successful goals and strategies should: Aim to eliminate SSOs and ensure that all sanitary sewage from the separated system is collected and conveyed to treatment". Please clarify the strategy for treating the remaining combined sewer systems while the separation of sanitary and stormwater systems continues.	Combined sewers continue to exist in parts of Vancouver, Burnaby and New Westminster, and the target dates for achieving CSO elimination are 2050 (Vancouver Sewerage Area) and 2075 (Fraser Sewerage Area). Beach closures related to elevated bacterial counts may be caused by a combination of numerous factors that include natural factors (presence of dogs, geese, seagulls and other wildlife, air and water temperature, sediment mixing, algal blooms, limited tidal action), as well as human-induced contributions (recreational boating and shipping holding tank discharges, stormwater runoff, CSOs, malfunction in wastewater conveyance or treatment systems, etc.) Historical data shows that coliform counts have fallen dramatically since sewer separation began in the early 1970s; however, closures can sometimes still occur due to the reasons noted.Flows in combined sewerage areas are routed to wastewater treatment to the limits of system capacity during wet weather – when capacity is exceeded, CSOs can result. Where feasible, the intent in near term is to prioritize higher-strength wastewater (e.g., higher sanitary component) to treatment. The following proposed actions address CSOs in near term while long-term separation efforts are underway: 8.5, 8.6, 8.7, 9.2, 9.5, 9.6
27	Letter from kʷikʷəƛ̓əm (Kwikwetlem First Nation)	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Aug 24, 2022	Re: Share your Ideas: Metro Vancouver Wet Weather Wastewater Management Workshop Growth and Development: As part of the previous LWMP, MVRD committed to ensuring that wastewater infrastructure is updated in coordination with urban development; however, the Nation feels that development is often prioritized to meet population needs over impacts to culture, environment, and human health. How will the new LWMP tackle the balance between population growth and infrastructure upgrades differently? Similarly, how will the new LWMP reduce Sanitary and Combined Sewer Overflows (SSOs and CSOs) given expected population increases (~1 million people by 2050) and climate change predictions, if MVRD was not able to achieve reduction targets outlined in the previous plan?	All proposed CSO/SSO actions under Strategies 5 through 9 incorporate and/or address this feedback (not exhaustive of actions in other areas of the plan that may support this feedback). The updated Liquid Waste Management Plan will also include strategies and actions to continue to provide services for a growing population in a changing urban climate, such as creating and updating Master Sewer Servicing Plans to plan for and accommodate new and projected growth and development. SSOs and CSOs will also be addressed with a focus on demand side management (i.e. encouraging households, businesses and industries to conserve water and reduce wastewater flows and loads to the sewer system). Reducing the amount of sanitary sewer capacity wasted by rainwater leaking into the sewers will provide capacity for growth and reduce SSOs and CSOs.
28	Letter from kʷikʷəƛ̓əm (Kwikwetlem First Nation)	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Aug 24, 2022	Re: Share your Ideas: Metro Vancouver Wet Weather Wastewater Management Workshop Potential for Exfiltration: Though the Sanitary Sewage and Wet Weather Discussion Paper focuses on Inflow and Infiltration (I&I), the Nation requests more information on what research has been conducted on exfiltration as a dominant cause of soil, stream, and groundwater pollution during dry weather events. As winters become wetter and summers warmer, both wet weather and dry weather pollution may become more apparent. More specifically, MVRD has stated in the past that municipalities have completed some investigations (namely modelling and dye testing) and are fostering partnerships with local streamkeeper groups to monitor water quality. Please provide more information on the scope of this work (e.g., data collected, partnerships), and whether e-coli monitoring is being conducted throughout the year to account for seasonal variation.	As part of the biennial reporting in the LWMP, municipalities have been reporting on smoke and dye testing progress of their municipal sewer system. The progress varies by municipality. Some municipalities (e.g., City of Richmond) have noted sample collection during dry and wet seasons and analyzing for E.coli. Details of progress for municipalities can be found in the latest Biennial Report: https://metrovancouver.org/services/liquid-waste/reports-and-resources Municipalities are responsible for developing Integrated Watershed Management Plans (formerly called Integrated Stormwater Management Plans) and some are engaging with the local community, including streamkeepers groups for stream protection – the details of the engagement will vary by municipality. Metro Vancouver consolidates their information and publishes a report every second year (Interim Report): https://metrovancouver.org/services/liquid-waste/reports-and-resources At this time, Metro Vancouver has not conducted broad-scale research on exfiltration as a cause of soil pollution. However, proposed actions for the next LWMP to address infiltration will typically address exfiltration as well – i.e. water-tight, properly connected sewers will also address exfiltration. Proposed CSO/SSO actions for the next LWMP that incorporate and/or address this feedback include: 5.1, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3, 6.4 (inflow and infiltration/exfiltration). In addition, proposed actions in the next LWMP will ensure that municipalities will work with First Nations to develop, review and update Integrated Watershed Management Plans to ensure that First Nations values and priorities are well incorporated into these plans.

29	Letter from kʷikʷəƛ̓əm (Kwikwetlem First Nation)	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Aug 24, 2022	Re: Share your Ideas: Metro Vancouver Wet Weather Wastewater Management Workshop Incentives for Stormwater Action: In the Coquitlam River Watershed Roundtable (CRWR) Stormwater Action Plan, two priority strategies for stormwater management were identified: outreach to single family homeowners and adaptive management. In addition to an incentive for upgrading pipes on private property, MVRD could encourage best practices in rainwater management (e.g., planting rain gardens), water quality (e.g., using eco-friendly car wash), as well as providing incentives to protect green spaces such as riparian zones, which improve hydrology and provide habitat for many species dependent on these ecosystems. In addition, kwikwəƛ̓əm requests more information on how the LWMP will incentivize developers to implement green infrastructure and manage projects for ecosystem productivity and resilience. Note that this comment may be applied to the Holistic Stormwater Management Discussion Paper in future.	The use of green infrastructure is a key focus of the next LWMP and several proposed actions support the the enhanced use of green infrastructure. Action 10.5 Members will expand the use of green infrastructure, blue infrastructure, and other practices to mimic natural watersheds, reduce runoff and discharge, improve water quality and increase climate resilience. Action 11.2 requires members to update rainwater policies, programs, and bylaws in a harmonized manner. Metro Vancouver will coordinate the development of a guidance document to aid members in harmonizing rainwater policies, programs, and bylaws. Action 11.4 seeks to update the Master Municipal Construction Documents (MMCDs) such that green infrastructure guidelines become standards. The LWMP does not directly incentivize developers to install green infrastructure. Development falls under the jurisdiction of members. Incentivies may be considered as part of future IWMP development and as members review and their policies, programs, and bylaws (Action 11.2)
30	Letter from kʷikʷəƛ̓əm (Kwikwetlem First Nation)	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Aug 24, 2022	Re: Share your Ideas: Metro Vancouver Wet Weather Wastewater Management WorkshopIncentives for Private-side Combined Sewer System Separation: It is mentioned in the Combined Sewer Overflow Elimination and Sewer Separation Discussion Paper that private-side separation could be accelerated through financial incentives. kwikwəƛ̓əm suggests a sliding scale incentive program that takes into consideration risk factors affecting private combined sewer systems such as age, capacity, and the frequency and volume of infiltration of wastewater into the system. Systems that are older, have lower capacity, and greater variability in volume of wastewater infiltration should be incentivised to be replaced before systems that are younger, have greater capacity, and lower variability in volume of wastewater infiltration.	Municipalities have bylaws in place with triggers that require private properties undergoing significant renovation or redevelopment above specified monetary thresholds to separate combined private-side sewers. In some neighbourhoods that are undergoing separation of public-side combined sewers, municipalities will also target private-side combined sewers for separation. Some municipalities are also implementing financial incentives to expedite the separation of private-side sewers. The following proposed actions incorporate and/or address this feedback: 9.1, 9.3c, 9.5 - Note that 9.3c leaves specifics up to members.
31	Letter from kʷikʷəƛ̓əm (Kwikwetlem First Nation)	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Aug 24, 2022	Re: Share your Ideas: Metro Vancouver Wet Weather Wastewater Management Workshop Monitoring Action and Incidents: Both discussion papers show a map of sewer events specifically associated with MVRD sewer lines; however, they do not disclose those of member municipalities. It is our belief that all pollution events, both sewer and non-sewer, need to be documented in a transparent, and readily available format. kwikwəƛ̓əm is also curious to know who will be funding and conducting monitoring to inform priority locations and adaptive management, assist in emergency response, and aid in the identification, tracking, and penalizing of transgressions. kwikwəƛ̓əm First Nation also highlights the importance of tracking changes in behavior for homeowners (as suggested in the CRWR Stormwater Action Plan) and developers to inform future incentive programs. Further, both papers, while discussing actions that must be conducted in regional, municipal, and private sectors, does not indicate coordination of SSO and CSO elimination or tracking with municipalities. How does MVRD plan to reconcile communication between themselves and member municipalities and transparency of their coordination with the public and Indigenous Nations? With the real-time monitoring of SSOs and CSOs, kwikwəƛ̓əm is in favour of using older infrastructure for emergency overflows. The reuse of older sewer systems for emergency overflow purposes will prevent further ground disturbance that would be needed to remove such systems while providing a necessary function for fluctuating and highly variable environmental events such as the November 2021 atmospheric river event.	Metro Vancouver reports and documents all environmental incidents (sewer and non-sewer) in accordance with the *Spill Reporting Regulation*. Part of this emergency response includes assessment of environmental impact and collection of environmental samples by a third party qualified environmental professional. The intent in the next LWMP is to improve transparency and coordination between Metro Vancouver and its members on SSOs and CSO reduction through a more coordinated risk assessment. Sewer separation planning considers the future use of existing combined sewers to address extreme rainfall events due to climate change. The intention is to repurpose these overflow systems for future drainage needs to achieve climate resilience while protecting the wastewater system from potential surcharge and flooding. The following proposed CSO/SSO actions incorporate and/or address this feedback: 6.3, 7.1, 7.2, 7.3, 8.1, 8.2, 8.3, 8.4, 8.8, 9.2, 9.3, 9.4

32	Letter from kʷikʷəƛ̓əm (Kwikwetlem First Nation)	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Aug 24, 2022	Re: Share your Ideas: Metro Vancouver Wet Weather Wastewater Management Workshop Emergency Management: kwikwəƛ̓əm First Nation is interested in understanding more about how MVRD hopes to prevent and mitigate against construction-related incidents, pollution from stormwater runoff, and sewer/wastewater overflows. Given recent incidents at Stoney Creek, it seems that established bylaws are not being followed by developers, which is resulting in concrete-laden water entering our waterways. Further, there does not seem to be a process in place for MVRD and member municipalities to respond to larger incidents, which results in slow response times, a loss of data, and a lack of accountability. Please explain how MVRD and member municipalities will work together through the LWMP to prevent and respond more efficiently to these incidents to mitigate impacts while systems are being upgraded.	The management of stormwater runoff and illegal discharges to stormwater systems within the region is the responsibility of Metro Vancouver member jurisdictions. Metro Vancouver can provide support in the form of public education campaigns, or provide a forum for regional coordination, if requested by the member jurisdictions. As private side sewers fall within the jurisdiction of individual Metro Vancouver members, the individual member municipalities are responsible for investigating illegal discharges and enforcing their applicable bylaws (e.g. identifying responsible parties and issuing fines). Proposed actions in the next LWMP that address source control and pollution prevention include: 4.1 and 4.2. Proposed actions to address pollution from stormwater runoff include actions under strategies 10, 11, and 12. Proposed actions to mitigate sewer overflows include actions under strategies 5, 6, 7, 8, 9.
33	Letter from kʷikʷəƛ̓əm (Kwikwetlem First Nation)	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Aug 24, 2022	Re: Share your Ideas: Metro Vancouver Wet Weather Wastewater Management Workshop Indigenous Guardianship: kwikwəƛ̓əm respectfully requests that MVRD reach out to the Nation to discuss the inclusion of a kwikwəƛ̓əm First Nation Guardian in monitoring associated with the LWMP, particularly in areas in and around the Coquitlam River Watershed. Please reach out to fieldwork@kʷikʷəƛ̓əm (Kwikwetlem First Nation).com to arrange for our representation in the field. In addition, we request that all forthcoming documents including monitoring, incident, and conditions reports are forwarded to the Nation via fieldwork@kʷikʷəƛ̓əm (Kwikwetlem First Nation).com.	Metro Vancouver cannot commit to the inclusion of kʷikʷəƛ̓əm Guardians within the LWMP on our ongoing monitoring programs. Information regarding CSOs, SSOs and WWTP treatment interruptions is posted on the Metro Vancouver website in real-time here: https://metrovancouver.org/services/liquid-waste/real-time-sewer-overflow-map Metro Vancouver's monitoring data is available here: https://metrovancouver.org/services/liquid-waste/reports-and-resources Metro Vancouver notifies the First Nations Health Authority about all incidents.
34	kʷikʷəƛ̓əm (Kwikwetlem First Nation) Written Feedback	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Oct 25, 2022	Please note that kʷikʷəƛ̓əm First Nation asserts rights, title, and stewardship interests over all lands, waters, and resources within kʷikʷəƛ̓əm Traditional Territory. This includes the areas in and around the Project. As a decision-making authority, kʷikʷəƛ̓əm expects meaningful consultation for the Project to proceed. The Nation reserves the right to provide comments at any stage of the process. Please continue to notify kʷikʷəƛ̓əm via referrals@kʷikʷəƛ̓əm (Kwikwetlem First Nation).com of any activity related to the Project as planning progresses.	Metro Vancouver will continue to respectfully engage and share information with kʷikʷəƛ̓əm on projects within the Nation's Traditional Territory. We strive to engage early, often, and in an ongoing manner so that the Nation's priorities can be reflected to the greatest extent possible in the early stages of project decision-making.
35	Semiahmoo First Nation LWMP Meeting #1	Semiahmoo First Nation	Nov 15, 2022	Semiahmoo First Nation, along with the Salish Sea Initiative and the Shared Waters Alliance, is working towards the goal of reopening shellfish harvesting in Semiahmoo Bay (specifically fresh and salt water bivalves, mussels, and clams in the Bay and in Little Campbell River). This is a key focus for Semiahmoo First Nation in the next Liquid Waste Management Plan (LWMP).	Metro Vancouver will work with Semiahmoo First Nation towards the long-term, multijurisdictional goal of reopening shellfish harvesting in Semiahmoo First Nation Bay. The following proposed actions will lend support to this goal: 12.4, 19.2, 19.3, 20.1, 20.2
36	Semiahmoo LWMP Meeting #1	Semiahmoo	Nov 15, 2022	Semiahmoo would like to see opportunities to expand the Nation's voice in the next plan, with the top priority being water quality enhancement.	Metro Vancouver will work directly with Semiahmoo to identify values and priorities that will be integrated into goals, strategies, and actions across the next plan. Metro Vancouver has offered and will continue to offer meetings with Semiahmoo/Salish Sea Initiative/Shared Waters Alliance representatives and technical staff to more thoroughly discuss how Semiahmoo's perspectives can be achieved.
37	Semiahmoo LWMP Meeting #1	Semiahmoo	Nov 15, 2022	There is strained capacity to respond to high number of referrals annually.	Metro Vancouver invited Semiahmoo's comments and participation in Phase 2 of the LWMP update. Metro Vancouver can work with Semiahmoo to develop a similar scope of work for the future Phase 3 that includes Semiahmoo's preferred engagement activities.
38	Semiahmoo LWMP Meeting #1	Semiahmoo	Nov 15, 2022	Salish Sea currents result in contaminants and spills accumulating in the corner of the Bay, and with a large, trans-boundary territory, it is necessary to examine how to deal with the cumulative and jurisdictional effects on water quality.	In November 2020, Metro Vancouver initiated the establishment of a new multi-agency Estuary Management Program for the Metro Vancouver region, which considers Burrard Inlet, Fraser River and the Salish Sea, including Boundary Bay. This initiative, if supported by First Nations and senior government, would address cumulative and jurisdictional effects on water quality.

39	Semiahmoo LWMP Meeting #1	Semiahmoo	Nov 15, 2022	Semiahmoo needs to be included in municipal and regional plans and planning as the downstream effects of development, stormwater management, and pollutants all affect the Nation's community. The needs for Semiahmoo land are not integrated into any surrounding jurisdiction's system, unlike the municipal and regional systems.	The following proposed actions incorporate this feedback: 1.3, 10.2, 11.2, 12.4
40	Semiahmoo LWMP Meeting #1	Semiahmoo	Nov 15, 2022	There are three main areas of concern when it comes to poor water quality: 1. Stormwater runoff and its pollutants and contaminants 2. Fecal bacteria 3. Wastewater treatment effluent	It should be noted that none of Metro Vancouver's wastewater treatment plants discharge to Boundary Bay, nor are there any CSOs that discharge to Boundary Bay. There is one pump station that does occassionally overflow into Boundary Bay however. Rainwater is the major contributer to water quality impacts under the scope of the Liquid Waste Management Plan. The following proposed actions will lend also support to this feedback: 10.1, 10.2; 11.2, and all actions under Strategy 12 (stormwater), 13 and 14 (wastewater treatment); 19.2 (fecal bacteria)
41	Semiahmoo LWMP Meeting #1	Semiahmoo	Nov 15, 2022	Water quality guidelines are more stringent for shellfish harvesting than for recreational use, which has been the standard up to this point. Metro Vancouver has the opportunity to raise the bar for both stormwater and fecal bacteria.	Water quality objectives and guidelines are set by senior levels of government. Metro Vancouver and member jurisdictions consistently work to improve regional and municipal infrastructure and processes to achieve improved water quality outcomes. This will be a continuing key focus for the next LWMP. It's also important to note that none of Metro Vancouver's wastewater treatment plants discharge to Boundary Bay, nor are there any CSOs that discharge to Boundary Bay. There is one pump station that does occassionally overflow into Boundary Bay however. Rainwater is the major contributer to water quality impacts under the scope of the Liquid Waste Management Plan. The following proposed actions in the area of rainwater management aim to improve water quality in local waters, including Boundary Bay: 10.2, 11.2
42	Semiahmoo LWMP Meeting #1	Semiahmoo	Nov 15, 2022	There are issues with two federal regulatory systems on water quality in the Bay, due to the U.S./Canada border.	Metro Vancouver can work to increase awareness about the discrepancy between the two regulatory systems (American and Canadian) and the arising challenges in managing water quality.
43	Semiahmoo LWMP Meeting #1	Semiahmoo	Nov 15, 2022	Varying jurisdictions – stormwater under municipalities; creeks under the provincial government; oceans under the federal government – leave Semiahmoo vulnerable in the midst of multiple polluting sources and no jurisdiction. Semiahmoo asks that the new plan take into consideration these sources of pollution and require municipalities to monitor water quality and enforce the need for improvement beyond recreational water quality standards.	The regulation of stormwater discharges is beyond Metro Vancouver's mandate and rests with other orders of government, while the management of stormwater falls primarily under the jurisdiction of local municipalities. Local municipalities manage the impact of stormwater pollutants on local waterways through their Integrated Watershed Management Plans, formerly known as Integrated Stormwater Management Plans. Municipalities will continue to monitor waterways using the Adaptive Management Framework, and update their Integrated Watershed Management Plans as necessary to mitigate pollutants, and explore treatment options. First Nations will be involved in prioritizing watersheds and in developing and reviewing Integrated Watershed Management Plans (IWMP)s. The AMF also has water quality objectives which all municipalities must monitor as part of their IWMPs. The following proposed actions incorporate and/or address this feedback: 10.1, 10.2, 10.3, 10.4. Proposed action 4.1 addresses multi-jurisdictional source control advocacy, and working with First Nations to advance this.
44	Semiahmoo LWMP Meeting #1	Semiahmoo	Nov 15, 2022	How can the Nation partner with municipalities to address old infrastructure that is leaking contaminants into the tributaries and Bay?	While working directly with the municipality with the faulty infrastructure would be ideal, proposed action 1.3 in the new LWMP aims to bring First Nations and member jurisdictions together to discuss and collaborate on issues such as these. Also, proposed actions 1.1 and 1.2, utilize asset management to address older or faulty infrastructure for both Metro Vancouver and our municipal members.
45	Semiahmoo LWMP Meeting #1	Semiahmoo	Nov 15, 2022	Semiahmoo wants to know that the feedback the Nation gives, with its limited capacity, will be truly integrated in the next plan. And there needs to be flexibility with deadlines.	Metro Vancouver will note (as in this table) where Semiahmoo feedback has been incorporated into the next plan, and if it hasn't why not, to show that Metro Vancouver is meaningfully considering and incorporating Semiahmoo feedback, where it is within the scope of the LWMP to do so.
46	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: General - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Would be helpful to have single page numbering system + line numbering. Comments below are based on page #s listed on the bottom of each page	Comment regarding formatting of discussion papers taken into account on future documents.

47	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Introduction - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Overall, connection of stormwater and contaminants to human health, including Indigenous food security and food sovereignty, needs to be mentioned explicitly. Need recognition that contamination (e.g. via stormwater) also impacts Indigenous rights, including their ability to practise cultural traditions, which includes food security. As per UNDRIP and BC DRIPA: "Indigenous peoples have the right to practice and revitalize their cultural traditions and customs."	Strategy 10, *Manage rainwater and development for watershed health*, includes two actions that note First Nation involvement in Integrated Watershed Management Plans, and includes a reference that states that watershed health is integral to First Nations food security and food sovereignty. Food security can also be impacted by stormwater inflows causing combined sewers to overflow (CSOs) and excess stormwater entering sanitary systems causing sanitary sewer overflows (SSOs). The new LWMP contains numerous actions to address CSOs and SSOs (Strategies 5 - 10).
48	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Introduction (Bottom of Page) - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft There are some things that are already known, or can be assumed, from this region and others, e.g. the types of contaminants that tend to be found in urban runoff, and the typical sources of these contaminants. That knowledge should be applied as per the precautionary principle.	Reporting and tracking progress of Integrated Watershed Management Plans (IWMPs) has been challenging for municipalities, due to a low frequency of their monitoring efforts. Proposed actions aim to enhance the use of IWMPs and the AMF to monitor and respond to watershed health: 10.1, 10.2, 10.3, 11.3 and 12.1
49	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Who is Affected? - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Indigenous rightsholders being invited to co-develop the plan to help ensure Indigenous rights are protected is different (and preferred) to being invited to share as part of a list with various stakeholders.	Metro Vancouver seeks to engage meaningfully with First Nations on the Liquid Waste Management Plan by facilitating dialogue and incorporating input into the Plan to the greatest extent possible. Metro Vancouver fully understands that səlilwətaɬ (Tsleil-Waututh Nation) as a government partner and rights-holder is different from the general public when it comes to feedback received. We strive to provide separate opportunities for First Nations to discuss their interests and perspectives. For this reason, Metro Vancouver supported the Nation's interest in deep engagement on the LWMP and have been meeting monthly with səlilwətaɬ (Tsleil-Waututh Nation) on the LWMP update, sharing draft strategies and actions for their input since April 2024.
50	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Principles, 2nd Bullet - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Protect Indigenous values and reflect and integrate Indigenous perspectives in holistic stormwater management solutions	The Adaptive Management Framework (AMF) is to be incorporated into Integrated Watershed Management Plans (IWMP) to help improve water quality. Actions 10.1, 10.2a and Strategy 12 (*Enhance Interagency Collaboration to Improve Watershed Health Across the Region)* include proposed actions to get First Nations input and perspectives on the AMF and IWMPs, incorporating this feedback.
51	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Approach, Starting Point, 2nd Bullet - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft What have the results been? Have they been measured with respect to contamination levels from stormwater runoff?	Reporting and tracking progress of Integrated Watershed Management Plans (IWMPs) has been challenging for municipalities, due to a low frequency of their monitoring efforts. Proposed actions aim to enhance the use of IWMPs and the AMF to monitor and respond to watershed health: 10.1, 10.2, 10.3, 11.3 and 12.1
52	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Approach, Starting Point, 4th Bullet, 2nd Sub-Bullet - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Is it a question of ability, or effort?	The following proposed actions incorporate and/or address this feedback (enhancing green infrastructure outcomes): 10.5, 11.2, 11.4, and 12.3
53	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Approach, Starting Point, 5th Bullet - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draftWhat were the main takeaways of the workshop?	The main takeaways of the 2022 green infrastructure workshop were an expanded regional coordination role for Metro Vancouver in order to advance the successful implementation of green infrastructure across the region. Proposed actions to advance green infrastructure include: 10.5, 11.2, 11.4

54	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Approach, Starting Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Add point about the extent to which Indigenous Nations have/have not been engaged in approaches to stormwater management to date (e.g. have not been invited to SILG).	Proposed strategies and actions to engage and involve First Nations in stormwater management in the next plan include: 10.1 a), 10.2 (a) and (b), 12.4, in an effort to address this feedback.
55	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: What's Changed? - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Also floods vs. droughts indicate that there is a need to balance the way stormwater is treated/used/stored as a resource.	Proposed strategies and actions to better manage rainwater as a resource are included across Strategies 10, 11 and 12, in particular in proposed action: 10.3.
56	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Contaminants in Stormwater - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft And, through work such as səlilwətaɬ (Tsleil-Waututh Nation)'s Burrard Inlet Water Quality Objectives, there is an increasing understanding of the risk of CECs on human health, including the consumption of seafood, and food security (a key Indigenous value).	Proposed actions that incorporate and/or address this feedback about the risk of CECs on human health and consumption of seafood, include: 4.1, 10.5, 19.3
57	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Contaminants in Stormwater - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Need both enhanced regulations and greater controls.	The regulation of stormwater discharges is beyond Metro Vancouver's mandate and rests with other orders of government, while the management of stormwater falls primarily under the jurisdiction of local municipalities. Local municipalities manage the impact of stormwater pollutants on local waterways through their Integrated Watershed Management Plans, formerly known as Integrated Stormwater Management Plans. Municipalities will continue to monitor waterways using the Adaptive Management Framework, and update their Integrated Watershed Management Plans as necessary to mitigate pollutants, and explore treatment options. Proposed actions that incorporate and/or address this feedback include: 3.3, 4.1, 10.1, 10.2, 11.2
58	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Water Quality Objectives - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Good to see this explicitly integrated here. Please note that collaborative effort is between səlilwətaɬ (Tsleil-Waututh Nation) and Province of BC.	Comment regarding the reference to Burrard Inlet Water Quality Objectives in discussion paper, and noting that the effort was one between səlilwətaɬ (Tsleil-Waututh Nation) and the Province. Action 20.2 commits Metro Vancouver to continue to participate in the BC Ministry of Environment and Climate Change Strategy's processes to review and establish water quality objectives. We will aim to add a description to the LWMP of səlilwətaɬ's work on the BIWQOs and how Metro Vancouver is using the objectives. We would like to work with səlilwətaɬ on to develop this content (whether it is added as a 'call-out box' or in some other form).
59	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Improving Alignment - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Need consultation, not just engagement, with First Nations.	Metro Vancouver, as a local government, engages with First Nations on our projects and initiatives following the principles of meaningful engagement. The federal and provincial governments have a duty to consult and, if necessary, accommodate First Nations. The federal and provincial governments often delegate the procedural aspects of their duty to consult to project proponents. When seeking federal and provincial approvals and permits for its projects, Metro Vancouver (as a project proponent) is typically expected to carry out procedural aspects of the federal and provincial duty to consult.
60	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Question to Consider, 1st Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Build on work that has already been done to identify priorities.	Proposed actions that progress work done to date on improving stormwater management and water quality oucomes include 10.1, 10.2, 19.1, 20.1

61	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Question to Consider, 2nd Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draftI have no idea. Has there been any reporting out to səlilwətaɬ (Tsleil-Waututh Nation) about this? Or consultation with səlilwətaɬ (Tsleil-Waututh Nation) in their development and implementation?	Engaging with First Nations on Integrated Watershed Management Plans is a gap that was not adequately addressed in the last plan. The updated LWMP has specific proposed actions to include First Nations in Integrated Watershed Management Plan (formerly Integrated Stormwater Management Plan) development and implementation: 10.1, 10.2
62	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: New Opportunities, 2nd Last Bullet - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Build on the work səlilwətaɬ (Tsleil-Waututh Nation) has already done, which has taken a multi-sectoral approach.	All Metro Vancouver receiving environment monitoring programs for Burrard Inlet are using the Burrard Inlet Water Quality Objectives as metrics for comparison and protection of human and environmental health.
63	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: New Opportunities, Last Bullet - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Promoting healthy waters and human health (the public will connect more with personal health impacts).	Everyone has a role to play to support the health of our local waters, and we know that public education is integral to improved water quality, by improving wastewater flows and pollutant loadings. The following proposed actions aim to promote healthy waters through public education campaigns: 3.1, 4.2, 5.1, 12.1
64	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Questions to Consider, 1st Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Summarize existing work done by səlilwətaɬ (Tsleil-Waututh Nation) and others in the region or elsewhere.	Proposed actions in Strategy 12 - Enhance interagency collaboration to improve watershed health across the region, and action 20.1 (Metro Vancouver will participate in relevant collaborative environmental program(s) for regional water bodies (i.e., Fraser River, Burrard Inlet, Strait of Georgia) along with other interested parties including members, First Nations, senior government and stakeholders) both provide opportunities for learning about the work of others, including səlilwətaɬ, documenting best practices, and using them in the development of Integrated Watershed Management Plans (previously 'Integrated Stormwater Management Plans'). We will aim to add a description to the LWMP of səlilwətaɬ's work on the BIWQOs and how Metro Vancouver is using the objectives. We would like to work with səlilwətaɬ on to develop this content (whether it is added as a 'call-out box' or in some other form).
65	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Questions to Consider, 2nd Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Requirements rather than voluntary measures. Enable First Nations participation in collaborations, and respect Indigenous science on par with western science. Break down silos and coordinate info and actions among jurisdictions (we at səlilwətaɬ (Tsleil-Waututh Nation) had a very difficult time pulling together a holistic map of the Burrard Inlet watershed/sewer shed and stormwater outfalls because jurisdictional info was inconsistent and difficult to obtain, which showed us that we were the first to bring together that information on a basin-wide scale).	Requirements, rather than voluntary measures, can be more effective in some cases. There are several actions in the updated LWMP that include getting input from First Nations on stormwater management. Consistency in data amongst jurisdictions should be improved via new actions in the LWMP to facilitate working together. Proposed actions that incorporate and/or address this feedback include: 10.1, 10.2, 10.4, 11.2 (harmonizing rainwater policies, programs and bylaws), 11.3, 12.1 (update Stormwater Interagency Liaison Group Terms of Reference), 12.4 (regular forums to facilitate knowledge sharing)
66	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Questions to Consider, Last Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Integrate them, including senior decision-makers, into these discussions so that they are educated from the ground up. Demonstrate connections to population health and human rights, and make direct connections to effects on charismatic endangered species such as SRKW and their prey (and the prey of their prey).	The following proposed actions incorporate and/or address inter-governmental collaboration and public education: 19.1, 20.1, 20.2 (intergovernmental collaboration); 3.1, 4.1, 4.2, 5.1 (public education)

67	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Blue Box At Top of Page, 1st Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft They are entering the market faster than regulations are catching up to control them. Need to work with chemical regulation authorities, and push ECCC to move faster.	The following proposed action incorporates and/or addressses this feedback, including working with First Nations to advocate for increased federal and provincial regulations on the manufacturing and use of products with contaminants: 4.1
68	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Blue Box At Top of Page, 2nd Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draftDevelop a monitoring program, in coordination with existing monitoring programs (səlilwətaɬ (Tsleil-Waututh Nation) has been leading monitoring coordination efforts and will soon publish guidance on monitoring, as part of the Burrard Inlet Water Quality Objectives work). Make the results public and the data accessible (e.g. enter into BC EMS). Currently a black box.	The Stormwater Monitoring and Adaptive Management Framework developed by the municipalities, MV and Ministry of Environment and Climate Change Strategy outlines a regional weight -of- evidence performance measurement approach used to monitor stormwater, and assess and report the implementation and effectivenes of Integrated Watershed Management Plans. The results and outcomes have been reported out in LWMP Biennial Reports and posted on the Metro Vancouver web site. The following proposed actions incorporate and/or address monitoring programs: 10.1c, 10.2b, 11.3 (online dashboard), 19.1 (oversight of monitoring programs)
69	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Strategy 2, Background, 1st Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft A good point, indicating a need to coordinate with upstream communities on the Fraser.	Upstream commuities on the Fraser River are outside of the scope of the LWMP. Upstream communities within Metro Vancouver are consulted as part of Integrated Watershed Management Plan development and Action 11.2 will assist members with harmonizing Policies and Bylaws.
70	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Strategy 2, Background, Last Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Including protection of Indigenous values [remove "wherever reasonable" - it always makes sense to integrate multiple benefits, and holistic stormwater management would inherently have multiple benefits].	The following proposed actions incorporate and/or address this feedback about the importance of including Indigenous values in stormwater management: 10.1, 10.2, 12.4
71	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: New Opportunities, 2nd Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft This point is confusing; reword?	The intent of this section of the discussion paper was to note that opposing requirements can limit the implementation of green infrastructure.The following proposed actions aim to address this kind of situation: 11.2, 11.4, 12.1, 12.4
72	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: New Opportunities, 7th Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Restore drainage courses/systems AND their riparian zones (vegetation).	Proposed action 10.4 incorporates this feedback by including the requirement to protect riparian areas through IWMPs.
73	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Questions to Consider - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft See management options related to stormwater from our Burrard Inlet WQOs technical reports (copied below).	The stormwater management options referenced here are included below, rows 76 through 104. Actions that address the management options are noted within those rows.

74	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Questions to Consider, 1st Point - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Hard to say when we haven't seen the existing data or AMF metrics.	Stormwater data sharing will be expanded through the development of member jurisdictions' online rainwater management dashboards, with First Nations involvement. Proposed actions 10.1, 10.2, 11.3 address this feedback.
75	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Monitor and research the environmental effects of alternative flame retardant chemicals in the marine environment in order to develop appropriate and timely guidelines for the use of these chemicals, and prior to their application in consumer products.	Flame retardants have been included in Metro Vancouver's environmental monitoring programs to assess the environmental effects of substances present in wastewater. However, as a regional utility, Metro Vancouver has no jurisdiction over the application of any substances in consumer products. Regulation of chemicals in consumer products in Canada is the federal government's responsibility. Proposed actions to lend support to this feedback include: 4.1, 13.3
76	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draftCharacterize pollutant loadings from stormwater and other non-point sources of pollution to Burrard Inlet. Look into other (more innovative?) stormwater water sampling methods than just grab sampling. Composite sampling of entire runoff events, passive sampling for long-term ambient monitoring, flow-weighted sampling. Capture the water quality during the "first flush" after a dry period from the storm water system to the streams and Inlet. Targeted monitoring to identify where pollution loads are greatest and then working upstream to identify potential sources.	The updated LWMP will require that the Integrated Watershed Management Plan template be reviewed and updated. First Nations will be able to participate in the update of this template, and the development and review of IWMPs, processes which can consider the inclusion of these recommendations.The following proposed actions address this feedback at a high level: 10.1, 10.2, 10.3, 10.4
77	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Expand water quality and flow monitoring for rivers, creeks, and stormwater outfalls entering Burrard Inlet.	Integrated Watershed Management Plans are required for all regional watersheds, including those that flow into Burrard Inlet. IWMPs require water quality monitoring. Metro Vancouver members will continue to review and update IWMPs, working with First Nations, and use Adaptive Management Framework monitoring to ensure IWMP actions undergo continuous improvement. Proposed Actions 10.1 and 10.2 incorporate and/or address this feedback.
78	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Develop an industry-specific eco-certification program to encourage adoption of best management practices for reducing non-point source pollution.	This is not under the LWMP mandate, but may be further explored with interagency rainwater group (proposed action 21.1). Note: Metro Vancouver and its member jurisdictions have a Stormwater Interagency Liaison Group, with a mandate to advise and work through technical stormwater issues with Metro Vancouver member jurisdictions, and senior government agencies. This group, which will be restructured as part of the Liquid Waste Management Plan update to lead local research on stormwater, to promote education and outreach, and act as the primary regional advocate with provincial and federal regulators to advance concerns about stormwater pollutants.
79	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Public education, awareness and regulation towards the following: · Use of reduced zinc or zinc-free roofing materials; replace, coat or paint galvanized surfaces and explore roof treatments to keep zinc out of runoff; · Use of moss control and anti-fouling products that do not contain zinc; · Use of non-metal fencing and building materials; · Vehicle maintenance to prevent drips and leaks of motor oil; and · Proper disposal and recycling of marine anodes	Everyone has a role to play to support the health of our local waters, and we know that public education is integral to improved water quality. Metro Vancouver is open to working with First Nations to advance public education in these areas. Action 12.1 commits the rainwater management interagency group to promote education and outreach on rainwater management. At a higher level, the following proposed actions aim to promote healthy waters through public education campaigns: 3.1, 4.2, 5.1

80	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Outreach and education to businesses through programs such as Salmon Safe.	Everyone has a role to play to support the health of our local waters, and we know that public education is integral to improved water quality. Metro Vancouver is open to working with First Nations to advance public education in these areas. Action 12.1 commits the rainwater management interagency group to promote education and outreach on rainwater management. At a higher level, the following proposed actions aim to promote healthy waters through public education campaigns: 3.1, 4.2, 5.1
81	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Produce collective infographic to show pollution sources, sinks and effects on our values to be shared widely; send via institutions' communications channels.	The LWMP commits members and Metro Vancouver to re-forming an interagency group focused on rainwater management and watershed health with updated terms of reference, vision, and workplans (Action 12.1). The interagency group will promote education and outreach on rainwater management which could include the development of such an infographic, as well as helping to share on regional communications channels.
82	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draftSocial media campaign and educational website for stormwater pollution that is tied to salmon and whales - connect to storm drain marking programs.	Everyone has a role to play to support the health of our local waters, and we know that public education is integral to improved water quality. Metro Vancouver is open to working with First Nations to advance public education in these areas, including helping to share edcuational campaigns on regional communications channels. At a higher level, the following proposed actions aim to promote healthy waters through public education campaigns: 3.1, 4.2, 5.1, 12.1
83	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft səlilwətaɬ (Tsleil-Waututh Nation) has requested VFPA add a policy direction to reduce stormwater discharge in existing and proposed Port development.	This is outside the scope of the LWMP, however, all actions under Strategies 10, 11 and 12 aim to improve Metro Vancouver and member jurisdictions stormwater management. The Port Authority is a member of the LWMP's Environmental Monitoring Committee.
84	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Develop and implement Integrated Stormwater Management Plans (ISMPs) for all developed watersheds that flow into Burrard Inlet. The ISMPs address erosion, drainage, flooding, stream health and remediation of any potential water quality issues within watersheds. Implement stormwater management in urban areas to mitigate surface runoff, erosion and flooding. Stormwater discharges transport material that may affect physical parameters, such as acid sediment, nutrients, and solids, from land to water. Increased vegetative cover and enhanced stormwater infiltration may reduce the water temperature of stormwater and has the potential to reduce peak flows of stormwater, leading to reduced erosion and hence turbidity and TSS concentrations in receiving waters. Look at upland impacts (e.g. Impermeable surface area, riparian areas, maintaining natural water storage, etc.).	All municipal areas tributary to Burrard Inlet should have or are developing / updating their Integrated Watershed Management Plans, which address the factors noted in the comment (e.g. erosion, drainage, flooding, stream health and remediation of water quality issues). The following proposed actions incorporate and/or address this feedback: 10.1, 10.2, 10.3, 10.4, 10.5
85	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Under the federal Fisheries Act, Metro Vancouver and its member municipalities (Vancouver, West and North Vancouver, Burnaby, Richmond, New Westminster, Surrey, White Rock, Delta, Coquitlam, Port Coquitlam, Langley, Maple Ridge, Port Moody, etc.) are not allowed to	The Adaptive Management Framework protocols require members to monitor water quality, and provide guidance to help members to continuously improve and adapt their Intetgrated Watershed Management Plan actions should the monitoring results indicate that current IWMP actions need improvement.

				discharge storm or rain water that would negatively impact fish and their habitat.	
86	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Call for emergency review of 6PPD under CEPA (without leading to it just being replaced by another toxin). Improve tire manufacture to address issues with 6PPD.	As of June 24, 2024, Health Canada has added 6PPD as a priority for assessment to the proposed Plan of Priorities being developed under Section 73 of the *Canadian Environmental Protection Ac*t for consultation. Substance name: 1,4-Benzenediamine, N-(1,3-dimethylbutyl)-N'-phenyl- (6PPD). File Number - CAS RN: 793-24-8 (https://www.canada.ca/en/health-canada/services/chemical-substances/canada-approach-chemicals/request-assess-substance-canadian-environmental-protection-act-1999.html#a4). Proposed Action 4.1 in this LWMP commits to taking source control actions on priority contaminants using the CCME CWS-MMWE risk management decision framework. Actions may include education, advocating for increased provincial or federal regulations on the manufacturing and use of products with contaminants, and commits to working with First Nations on advocacy.
87	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Reduce the use of recycled tires for rubber crumb in artificial turf, tracks and playground surfaces around the Lower Mainland, and determine other environmentally friendly options to recycle tires. The municipalities of North Vancouver, Burnaby, Coquitlam, Port Moody, West Vancouver, and Vancouver all plan to install additional artificial fields. In Vancouver, the use of artificial turf fields is planned to increase between 2019 and 2022.	Proposed Action 4.1 in this LWMP commits to taking source control actions on priority contaminants using the Canadian Council of Ministers of Environment Canada-wide Strategy for Management of Municipal Wastewater (CCME CWS-MMWW) risk management decision framework. Actions may include education, advocating for increased provincial or federal regulations on the manufacturing and use of products with contaminants, and commits to working with First Nations on advocacy.
88	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draftAll projects to incorporate stormwater (and sediment) interception and treatment measures, and at the very least, oil-water separators.	This type of action is addressed by members within Integrated Watershed Management Plans. First Nations will be invited to participate in IWMP review and development, which can include actions such as these. Proposed Actions 10.2, 11.2 commit members to update and review IWMPs with input from First Nations, and review, update, and harmonize rainwater bylaws to better support these kinds of actions.
89	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Encourage adequate controls for runoff and erosion from urban development to prevent soil that may be highly contaminated (e.g. with arsenic from historical uses, and pesticides) from entering Burrard Inlet.	Concerns regarding rainwater run-off and erosion from urban development are partially addressed through proposed actions in the LWMP, as well as through municipal stormwater bylaws. For example, proposed action 10.4 commits members to align land-use planning and development with IWMPs to ensure development decisions support watershed health objectives, including protecting riparian areas and agricultural areas. Proposed action 10.2 includes First Nations in the development of IWMPs with members, providing the opportunity for plans to address runoff and erosion that may be highly contaminated (e.g. with arsenic from historical uses, and pesticides.)
90	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Environmental monitoring plans must include monitoring and mitigation for storm-water runoff.	Stormwater monitoring is addressed under proposed actions 10.1, 10.2, 10.3, and 10.4

91	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Regulate urban stormwater discharges by senior regulatory agencies.	The regulation of stormwater discharges is beyond Metro Vancouver's mandate and rests with other orders of government, while the management of stormwater falls primarily under the jurisdiction of local municipalities. Local municipalities manage the impact of stormwater pollutants on local waterways through their Integrated Watershed Management Plans. Municipalities will continue to monitor waterways using the Adaptive Management Framework, and update their Integrated Watershed Management Plans as necessary to mitigate pollutants, and explore treatment options. The Adapative Management Framework monitoring program has water quality targets which can be reviewed and enhanced with First Nations input during the development and updating of IWMPs - proposed action 10.1
92	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Require, for example through inclusion in ISMPs, for regular cleanout of catch basins and testing of the material for leachability.	This kind of municipal best management practice will be incorporated within Integrated Watershed Management Plan actions. Proposed actions 10.1, 10.2, 11.2 address this feedback.
93	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Increase adoption of source controls and design criteria that provide water quality treatment for stormwater runoff prior to discharge to Burrard Inlet, for example regular clean-out of catch basins, implementation of green infrastructure, and requirement for stormwater mitigations for new projects.	The use of green infrastructure is a key focus of the next LWMP and several proposed actions support the the enhanced use of green infrastructure. Action 10.5 Members will expand the use of green infrastructure, blue infrastructure, and other practices to mimic natural watersheds, reduce runoff and discharge, improve water quality and increase climate resilience. Action 11.2 requires members to update rainwater policies, programs, and bylaws in a harmonized manner. Metro Vancouver will coordinate the development of a guidance document to aid members in harmonizing rainwater policies, programs, and bylaws. Action 11.4 seeks to update the Master Municipal Construction Documents (MMCDs) such that green infrastructure guidelines become standards. The other approaches mentioned (catch basins, stormwater mitigations) would be incorporated within Integrated Watershed Management Plans best management practices and First Nations will have the opportunity to work with members to review and develop IWMPs,a as well as update the IWMP template (action 10.1 and 10.2)
94	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Invest in improved and new waste management infrastructure to deal with plastic wastes, and prevent microplastics from entering the Inlet.	Enhanced source control, including advocacy on improved composition of consumer and industrial products which create microplastics, is a focus in the updated LWMP. When considering level of treatment at wastewater treatment plants, Metro Vancouver follows the risk assessment approach established by the Canadian Council of Ministers of the Environment (CCME) Canada-wide Strategy for Management of Municipal Wastewater (CWS-MMWE) to determine effluent discharge objectives and meet National Performance Standards. Through ongoing monitoring and assessment programs this prescribed process can lead to actions to address microplastics such as source control initiatives, treatment process optimization and treatment plan improvements and upgrades: see proposed action 13.1 The release of untreated wastewater through CSOs and SSOs also contributes microplastics to the environment. The LWMP requires that all CSOs be eliminated by 2050 for the Vancouver Sewerage Area and 2075 for the Fraser Sewer Area. There are a number of proposed actions to monitor and address CSOs and SSOs: 7.1, 7.3, 7.4, 7.5, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.9, 9.3, 9.5
95	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Prioritize the implementation of source controls to reduce the volume, and improve the quality, of stormwater being discharged into Burrard Inlet.	Source control actions with respect to stormwater include actions 10.5 (increased use of green infrastructure) and 12.1 (updated rainwater interagency group Terms of Reference, to include the mandate to lead local research and advocate to regulators)
96	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draftReduce the frequency, duration, and magnitude of CSOs and SSOs (such as attenuation tanks, inflow & infiltration reduction measures, and other sanitary volume reduction measures).	Metro Vancouver is working with members on inflow and infiltration (I&I) reduction, through policies such as wet weather pricing (where members with more I&I pay more for their use of the regional system) as a means to incentivize action on I&I. MV and members are working on actions to reduce inflow from private side pipes, which is a significant contributor to the problem (i.e. more than 50% of I&I comes from private pipes), through public education campaigns. Members with combined sewer overflows are also working towards 100% sewer separation, as required in the LWMP, with the target of eliminating CSOs. Proposed actions to take action on I&I and CSOs include: 5.1, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3, 6.4, 7.1, 7.3, 7.4, 7.5, 8.2, 8.5, 8.6, 8.7, 9.1, 9.2, 9.3, 9.4, 9.6

97	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Clean paved surfaces with vacuum assisted dry sweepers to remove debris that can sorb zinc in runoff and prevent this debris from entering the stormwater system.	The use of vacuums to clean paved surfaces has been noted as a best management practice for improving stormwater runoff quality. This practice can be included in IWMPs, and First Nations will be able to take part in IWMP development, review, and update as part of the next plan. Proposed actions 10.1 and 10.2.
98	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Given that PCBs are frequently detected in stormwater, increased implementation of stormwater source controls, including green stormwater infrastructure such as swales, rain gardens, and tree trenches is needed.	The use of green infrastructure is a key focus of the next LWMP and several proposed actions support the the enhanced use of green infrastructure. These measures would generally be supported under IWMPs. Proposed actions that incoporate and/or support this feedback: 10.5, 11.4
99	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Implement green infrastructure measures, plant-based bioretention and other upland improvements to reduce entry of contaminants into marine waters via stormwater. For example, reduce impervious surfaces, require stormwater mitigations as part of new projects, ensure land use planning includes improvements to rainwater management such as plant based bio-filtration and other green infrastructure to improve rainwater quality as a goal for all urban areas, and regular cleanout of catch basins and testing of the material for leachability, for example through inclusion in ISMPs.	The use of green infrastructure is a key focus of the next LWMP and several proposed actions support the the enhanced use of green infrastructure. These measures would generally be supported under IWMPs. Proposed actions: 10.5, 11.4
100	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Revisit recommendations from 2019 Burrard Inlet Science Symposium: stormwater edition.	Metro Vancouver staff will review the recommendations from the 2019 Burrard Inlet Science Symposium: stormwater edition. Proposed action 12.4 proposes that Metro Vancouver and members host a forum at regular intervals to report progress on IWMPs and LWMP rainwater actions, and to foster collaboration and knowledge sharing among members, First Nations, and interested parties. This forum could offer the oppportunity for recommendations like these to be discussed and advanced.
101	Review of Metro Vancouver's Holistic Stormwater Discussion Paper	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 9, 2023	Re: Management Options Related to Stormwater from səlilwətaɬ (Tsleil-Waututh Nation) WQOs Technical Reports - HOLISTIC STORMWATER MANAGEMENT, 4 November 2022 draft Separate the combined sewers that connect to the Heather Street, Balaclava, Brockton Point, and Clark Drive CSOs.	All regional and municipal combined sewers in the Vancouver Sewerage Area must be separated by 2050 as required in the LWMP. Metro Vancouver, in collaboration with City of Vancouver, has developed sewer separation plans for areas tributary to the Heather and Balaclava CSO outfalls. Completion of sewer separation plans for the Clark Drive CSO and others without finalized separation plans is a requirement in the LWMP. Brockton's catchment is fully separated and is awaiting the redevelopment of a few remaining combined properties such as St. Paul's Hospital campus. Proposed actions in the LWMP that address and/or incorporate this feedback include 9.1, 9.2, 9.3, 9.4

102	səlilwətaɬ (Tsleil-Waututh Nation) LWMP Meeting #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 11, 2023	Request for a detailed description of Metro Vancouver's governance structure, technical advisory committees, and how decisions are made.	The following materials provide an overview of Metro Vancouver's governance and corporate structure:Metro Vancouver Handbook for Board and Committee Members (https://metrovancouver.org/boards/documents/BoardCommitteeOrientation%20Booklet.pdf) 2023 Board Orientation PresentationThe following Boards and Committees, comprised of elected officials, provide direction, and ultimately will approve the new Liquid Waste Management Plan (LWMP):Boards and CommitteesMetro Vancouver Regional Board (MVRD), or the Greater Vancouver Sewerage and Drainage District (GVS&DD): oversees and monitors the implementation of projects and plans Liquid Waste Committee (LWC): provides advice and recommendations to the Board on policies, bylaws, plans, programs, budgets and issues related to liquid waste managementThe following technical/corporate advisory committees, comprised of regional and municipal staff, have input on the content of the Liquid Waste Management Plan (LWMP) through the engagement process:Technical/Corporate Advisory CommitteesRegional Administrative Advisory Committee (RAAC): comprised of Chief Administrative Officers or City Managers from MV and each member jurisdiction, reviewing and discussing significant regional corporate actions and initiativesRegional Engineers Advisory Committee (REAC): comprised of utility General Managers and City Engineers from MV and each member jurisdiction, reviewing and discussing significant regional utility actions and initiativesRegional Financial Advisory Committee (RFAC): comprised of Chief Financial Officers from MV and each member jurisdiction, reviewing and discussing regional financial actions and initiativesREAC-Liquid Waste Subcommittee (REAC-LWSC): comprised of engineers from MV and member jurisdictions, discussing and workshopping regional utility actions and initiatives. Reports to REACEnvironmental Monitoring Committee (EMC): comprised of scientific and technical representatives from MV, University of British Columbia, Simon Fraser University , Ministry of Environment and Climate Change Strategy, Ministry of Agriculture, Fraser Health Authority, Vancouver Coastal Health, Environment and Climate Change Canada, Fisheries and Oceans Canada, Indigenous Services Canada, Vancouver Fraser Port Authority, Vancouver Sewerage Area, Fraser/Lulu Sewerage Area, and North Vancouver Sewerage Area. The committee identifies environmental concerns, proposes changes to liquid waste management practices, and provides advice on MV's environmental initiatives, and monitoring and assessment programsStormwater Interagency Liaison Group (SILG): comprised of representatives from MV and member jurisdictions, Ministry of Environment and Climate Change Strategy, Ministry of Agriculture, Environment and Climate Change Canada, and Fisheries and Oceans Canada. The committee provides technical advice on stormwater and urban runoff management and its integration into municipal growth strategies, and the development of standards and best practicesCombined Sewer Overflow Elimination Working Group (CSOE-WG): comprised of regional engineers from MV and member jurisdictions, working to support the elimination of CSOs and the separation of combined sewersIn general, periodic LWMP updates are provided to the regional sub-committees for their input on behalf of the member jurisdictions. LWMP updates are brought to the Metro Vancouver committees and Board at key points during the engagement process when higher-level input is sought, typically closer to the end of each phase of engagement.Once the next LWMP is approved by the Metro Vancouver Board, it will go to the Ministry of Environment and Climate Change Strategy (MOECCS). Plans are reviewed and approved by the Ministry, sometimes with amending conditions – and then they'll set the course for the future of liquid waste management in the region for roughly the next decade.
103	səlilwətaɬ (Tsleil-Waututh Nation) LWMP Meeting #1BB106	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 11, 2023	Request for Metro Vancouver to note in comment/response tables where səlilwətaɬ (Tsleil-Waututh Nation) feedback will be incorporated into the plan, or to include a rationale as to why it won't be, as well as how the feedback might be addressed by Metro Vancouver outside of the LWMP (if out of scope), where applicable.	Each of the Nation's comments will be responded to and summarized in the engagement summary that will be provided to the Ministry at the conclusion of Phase 2 engagement, and posted on the MV website. Metro Vancouver will also note where feedback has been incorporated into the draft plan at the end of Phase 2. Once the plan has been drafted, the Phase 3 engagement summary will note where feedback was incorporated and where out of scope feedback could be addressed. In the meantime, MV has continued to develop interim responses for review and feedback by səlilwətaɬ (Tsleil-Waututh Nation) as ongoing 1-1 meetings have continued.
104	səlilwətaɬ (Tsleil-Waututh Nation) LWMP Meeting #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 11, 2023	Request for staff to take a tour of a wastewater treatment plant.	A tour of Annacis Island Wastewater Treatment Plant, along with a second meeting on the LWMP, was held with səlilwətaɬ (Tsleil-Waututh Nation) on May 4, 2023.
105	səlilwətaɬ (Tsleil-Waututh Nation) LWMP Meeting #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 11, 2023	Request for information about Metro Vancouver's Youth4Action program, and whether First Nation schools, and specifically the səlilwətaɬ (Tsleil-Waututh Nation)'s high school, have been involved.	Information about the Youth4Action program was sent to səlilwətaɬ (Tsleil-Waututh Nation) staff on January 12, 2023 including information about First Nations' participation in the program to date.

106	səlilwətaɬ (Tsleil-Waututh Nation) LWMP Meeting #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 11, 2023	Request for information about the LWMP Phase 2 engagement Board report and what it will entail.	The following information was provided to səlilwətaɬ (Tsleil-Waututh Nation): The report will include a comment/response table of all feedback received from səlilwətaɬ (Tsleil-Waututh Nation) and others, as well as consolidated recommendations for the next plan, for the Board's consideration and direction. The report and the comment/response tables will be posted on the MV website, and provided to the Ministry of Environment and Climate Change Strategy.
107	səlilwətaɬ (Tsleil-Waututh Nation) LWMP Meeting #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 11, 2023	Request for an outline of the process to update the LWMP, and the plan going forward.	Metro Vancouver provided information on the process to update the plan and the plans for Phase 3 engagement, as well as an engagement work plan specifically created for səlilwətaɬ (Tsleil-Waututh Nation).
108	səlilwətaɬ (Tsleil-Waututh Nation) LWMP Meeting #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 11, 2023	Question about how the content for the LWMP technical workshop discussion papers was decided on.	Discussion papers were based on priority topics heard through engagement during Phase 1, from the MVRD Board, MoECCS, First Nations, member jurisdictions, Public Advisory Committee, the public, and others. Identified gaps from the previous plan also informed the development of the discussion papers, e.g. where situations, priorities, or understandings have evolved.
109	səlilwətaɬ (Tsleil-Waututh Nation) LWMP Meeting #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 11, 2023	Question about whether səlilwətaɬ (Tsleil-Waututh Nation)'s comments would be included in the public report or had been included in the past. The Nation is open to having their comments posted, but wants MV to share for review before posting.	Yes, as per direction received from the Province, First Nations comment/response tables are included in the publicly available Board report and provided to the Province, as a record of engagement. For Phase 1, all comments received, including those from səlilwətaɬ (Tsleil-Waututh Nation) (page 101 of PDF) were publicly posted and responded to: Liquid Waste Committee Agenda Package - April 13, 2022 (metrovancouver.org). The same process will occur for Phase 2 and Phase 3.
110	səlilwətaɬ (Tsleil-Waututh Nation) LWMP Meeting #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 11, 2023	Noted that the Nation wants to be a co-developer of the LWMP. Noted that Phase 2 seems late in the LWMP engagement process to start detailed conversations with the Nation – Phase 1 was completed without active feedback from səlilwətaɬ (Tsleil-Waututh Nation) Also asked why Metro Vancouver has been meeting with the LWMP Public Advisory Committee since fall 2021, without meaningful engagement with səlilwətaɬ (Tsleil-Waututh Nation) to date.	The following information was provided to səlilwətaɬ (Tsleil-Waututh Nation): MV has sought a government-to-government approach for First Nations' input on the LWMP. One-on-one meetings are being held (or offered to) with individual First Nations to focus solely on First Nations priorities and their detailed input on the content for the next LWMP. We are still in the early stages of drafting the content on which the plan will be based, and there are many opportunities to integrate the Nation's priorities into the draft content for the plan. We welcome any comments from səlilwətaɬ (Tsleil-Waututh Nation) on how to enhance our engagement process. The LWMP scope of work outlines engagement opportunities for Phase 2. We can revise this scope of work to include additional meetings and engagement activities. A separate scope of work will be developed for Phase 3 engagement, anticipated to start in late 2023. The LWMP engagement process follows the provincially-approved engagement strategy and subsequent Board direction, which includes concurrent engagement with First Nations, member jurisdictions, technical advisory committees, and the Public Advisory Committee (PAC). Public Advisory Committee meetings have been used to bring public participants up to speed on the regional and municipal wastewater system and the Liquid Waste Management Plan — what it does, why it exists, and why it needs to be updated. The PAC receives the same draft content for feedback as that provided to First Nations and Metro Vancouver's member jurisdictions. More information can be found under the "Public Advisory Committee" tab on the Liquid Waste Management Plan Update webpage. Following is a record of MV outreach and communication with səlilwətaɬ (Tsleil-Waututh Nation) ahead of and during Phase 1: Notification Phase July 17, 2020: MV letter to səlilwətaɬ (Tsleil-Waututh Nation) before the LWMP update begins Sept 14, 2020: səlilwətaɬ (Tsleil-Waututh Nation) CAO letter about interest in increasing the Nation's involvement in Metro Vancouver's plans and processes, in particular the LWMP Dec 3, 2020: MV CAO and səlilwətaɬ (Tsleil-Waututh Nation) CAO meet to discuss various agenda items, including the LWMP update Phase 1 Engagement Oct 27, 2021: MV letter about the four phases of LWMP engagement; an invitation to meet; and to participate in an upcoming webinar and survey, on the vision and guiding principles Oct 29, 2021: səlilwətaɬ (Tsleil-Waututh Nation) letter about being directly involved in the next LWMP, in technical committees and working groups working on the update. The need for capacity funding to take part in these activities was also noted

					Jan 20, 2022: MV letter notifying səlilwətaɬ (Tsleil-Waututh Nation) of the availability of funding to support participation in the LWMP update
111	səlilwətaɬ (Tsleil-Waututh Nation) LWMP Meeting #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 11, 2023	Request for an explanation of how First Nations feedback will be addressed by Metro Vancouver. The Nation may choose to provide a separate submission to the Province, sharing their feedback and noting whether the Nation feels their comments have been adequately addressed by the next plan.	Metro Vancouver intends to develop a plan that integrates First Nations' priorities, including səlilwətaɬ (Tsleil-Waututh Nation)'s priorities. The Province needs to be satisfied that Metro Vancouver has appropriately engaged with First Nations, and has adequately addressed or incorporated their feedback. Metro Vancouver understands the Nation's right to provide a separate submission to the Province.
112	səlilwətaɬ (Tsleil-Waututh Nation) LWMP Meeting #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 11, 2023	Request to confirm whether the Province had delegated procedural aspects of the consultation process on the LWMP to Metro Vancouver.	Yes, the Province confirmed delegation of procedural aspects of the LWMP consultation to Metro Vancouver. Metro Vancouver is responsible for information-sharing and engagement, and will be providing the Province with its engagement records.
113	səlilwətaɬ (Tsleil-Waututh Nation) LWMP Meeting #1	səlilwətaɬ (Tsleil-Waututh Nation)	Jan 11, 2023	Request that Metro Vancouver staff review the water quality technical reports for the Burrard Inlet Water Quality Objectives (BI WQO) to be used in the development of the LWMP. Noted that rich data analysis has been done, that may be specific to the Burrard Inlet, but could be used to develop similar metrics or objectives for other water bodies. Further, ask that the vision and values guiding the BI WQO, and the 120 recommendations, be used to help develop the LWMP.	Metro Vancouver's Burrard Inlet Receiving Environment Monitoring Programs are designed to evaluate attainment of the Burrard Inlet Water Quality Objectives, and will continue to do so with the updated BIWQOs developed by the Province and səlilwətaɬ. Proposed strategies and actions that reference the Canadian Council of Ministers of the Environment (CCME) Canada-wide Strategy for the Management of Municipal Wastewater Effluent (CWS-MMWE) Environmental Risk Management Framework incorporate relevant water quality objectives such as the BIWQOs. In the specific case of the Burrard Inlet Water Quality Objectives vision and values, we will aim to add a description to the LWMP of səlilwətaɬ's work on the BIWQOs and how Metro Vancouver is using the objectives. We would like to work with səlilwətaɬ on to develop this content (whether it is added as a 'call-out box' or in some other form).
114	kʷikʷəƛ̓əm (Kwikwetlem First Nation)-MV Technical Working Group Meeting	Brown & Oakes Archaeology	Feb 7, 2023	Comment: Thank you for presentation; appreciate integration of concerns/comments. This helps continue productive conversation moving forward.	Metro Vancouver was pleased to provide an LWMP update at the kʷikʷəƛ̓əm (Kwikwetlem First Nation)-Metro Vancouver Technical Working Group meeting.

115	kʷikʷəƛ̓əm (Kwikwetlem First Nation)- MV Technical Working Group Meeting	Brown & Oakes Archaeology	Feb 7, 2023	Comment: 1:1 meetings would be helpful and these will be coordinated off-line. Adequate capacity funding supports good discussion/engagement.	Metro Vancouver invited kʷikʷəƛ̓əm (Kwikwetlem First Nation) comments and participation in Phase 2 of the LWMP update. 1-1 meetings with kʷikʷəƛ̓əm (Kwikwetlem First Nation) were held in July 2023 and September 2024 and are ongoing. Metro Vancouver can work with kʷikʷəƛ̓əm (Kwikwetlem First Nation) to develop a similar scope of work for the future Phase 3 that includes kʷikʷəƛ̓əm (Kwikwetlem First Nation)'s preferred engagement activities.
116	q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation) Meeting #1 Response Table	q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation)	Mar 7, 2023	Noted that there is strained capacity to respond to high number of referrals.	Metro Vancouver understands there is strained capacity and many projects and plans for q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation) to consider and participate in. We are happy to work with q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation) to create an engagement approach that works for the Nation. Metro Vancouver can work with q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation) to develop a similar scope of work for the future Phase 3 that includes Kwantlen's preferred engagement activities.
117	q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation) Meeting #1 Response Table	q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation)	Mar 7, 2023	Question about whether the LWMP incorporates environmental monitoring and enforcement, including the inspection and maintenance of facilities.	Metro Vancouver has an Environmental Management and Quality Control (EMQC) division that has a number of programs related to environmental management, comprised of environmental monitoring, environmental assessments including toxicological, human health and ecological risk assessments, environmental simulations, modelling and forecasting, monitoring of collection system, operation of wastewater treatment plants and discharges from the liquid waste system as well as environmental health of recieving waters. Key reports are available here: https://metrovancouver.org/services/liquid-waste/reports-and-resources Metro Vancouver also has an Environmental Regulation and Enforcement (ERE) Division. ERE is tasked with issuing authorizations for discharges into the wastewater collection system, enforcing regional environmental regulations, bylaws, and policies for Metro Vancouver, and working with the member jurisdictions to coordinate enforcement at the municipal level. The updated LWMP will incorporate actions to enhance environmental monitoring as well as regulation and enforcement. Proposed actions that incoporate and/or address this feedback are: 13.1, 13.2, 13.3, 13.4, 19.1, 19.2, 19.3, 20.1
118	q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation) Meeting #1 Response Table	q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation)	Mar 7, 2023	There has been a rapid decrease in salmon stock over the last 10 years due to water quality impacts. To effect change, it will be necessary to have a plan in place that has actions to improve water quality that can be managed and enforced. It can be cheaper for companies to just pay a fine in some cases. The next plan needs more enforceable penalties, more action to enforce.	While the LWMP includes a number of actions from MV and its members to address stormwater quality (see proposed actions under Strategies 10, 11, and 12), industries that discharge directly to the receiving environment are under provincial jurisdiction.
119	q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation) Meeting #1 Response Table	q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation)	Mar 7, 2023	q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation) has concerns about the constant expansion of infrastructure, including roads and bridges, and the lack of effective groundwater management, all while climate change contributes to higher water flows and reduces water quality. More and more impermeable surfaces are being created, with a lack of green infrastructure and bioswales to filter contaminants and mitigate climate change. Noted that municipal developers also contribute to the problem, with piecemeal work on developments affecting fish, streams, and groundwater.	The next plan will incorporate actions to better manage and support the implementation of green infrastructure management in the region, working to help municipalities use it to limit peak flow and improve water quality. The LWMP also aims to improve the development and implementation of municipal Integrated Watershed Management Plans, which lay out actions to help address the impacts of development on water quality in the region, as well as to address groundwater management. Other proposed actions aim to align land use planning and development with Integrated Watershed Management Plans to ensure development decisions support watershed health objectives, including protecting riparian areas. Proposed actions that incorporate and/or address this feedback: 10.1, 10.2, 10.3, 10.4 10.5, 11.3, 11.4, 12.2, 12.3
120	q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation) Meeting #1 Response Table	q̓ʷɑ:ńƛ̓əń (Kwantlen First Nation)	Mar 7, 2023	Noted that another major concern is flooding, citing the Sumas flooding during the November 2021 atmospheric river. All reserve lands are in compromised locations in low flood plains. It isn't possible to only use dykes to solve the problem – water will find its way. Suggestion to develop more wetlands as a flood water management strategy, improving biodiversity and ecosystems, and providing a place for water to go.	To address this feedback, members will expand the use of green infrastructure (action 10.5), including bioswales to help address water quantity (flooding) and quality. Green infrastructure implementation actions can be considered within IWMPs. Proposed actions that incorporate and/or address this feedback: 10.3, 10.4

121	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	The last paragraph refers to engagement strategy. What is the engagement strategy? It is also mentioned that the process includes robust First Nations engagement, but we have not yet been informed what the First Nations engagement strategy is. It is up to the First Nations themselves to determine whether the process is robust or not. At this point, we can see that efforts are being made, but we cannot say that it is robust. Stating that the intention is to include robust First Nations engagement would be a useful statement, and would give room to make improvements and integrate First Nations' required and requested consultation processes.	The engagement strategy, approved by the Ministry of Environment and Climate Change Strategy, is available online here: https://metrovancouver.org/boards/GVSDD/SDD_2020-Oct-2_AGE.pdf#search=%22GVSDD%22, page 14 of 116 It is Metro Vancouver's intention to include robust First Nations engagement, and, as səlilwətaɬ (Tsleil-Waututh Nation) notes, it will be up to First Nations to say whether the process has achieved that. In response to this feedback, Metro Vancouver developed an engagement workplan specifically for səlilwətaɬ and for the Nation's input. Subsequent monthly meetings on the LWMP have been held with səlilwətaɬ (Tsleil-Waututh Nation) since April 2024.
122	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Overall, the intent sounds positive and encouraging. A lot of useful information and interesting and encouraging ideas were also shared at the March 29th meeting. It was very helpful to learn about the current processes and research initiatives from Metro Vancouver staff - First Nations should be looped into those discussions earlier.	Metro Vancouver is committed to meaningful engagement, dialogue, and collaboration with First Nations on our plans, programs and projects, as outlined in Metro Vancouver's Board Strategic Plan, 2022-2026. We also continue to build and strengthen respectful and reciprocal relationships with First Nations, guided by the principles of UNDRIP "as a standard of achievement to be pursued in a spirit of partnership and mutual respect." Metro Vancouver will continue to work to improve our engagement and collaboration practices, working with First Nations.
123	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	It contains critical resources, such as water, energy, heat, and nutrients	The new LMWP continues a number of actions promoting the recovery of water, energy, heat, and nutrients from wastewater (Strategy 16 - *Implement proven resource recovery technologies* and Strategy 17 - *Research and pilot innovative technologies to advance the circular water economy*).
124	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Not only regulatory but also Indigenous and other community needs	Metro Vancouver is committed to meaningful engagement, dialogue, and collaboration with First Nations on our plans, programs and projects, as outlined in Metro Vancouver's Board Strategic Plan, 2022-2026. We also continue to build and strengthen respectful and reciprocal relationships with First Nations, guided by the principles of UNDRIP "as a standard of achievement to be pursued in a spirit of partnership and mutual respect." Metro Vancouver is working closely in particular with the Province and First Nations to better understand its role in advancing UNDRIP.
125	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Meet or exceed Indigenous and regulatory requirements … from unexpected and evolving requirements, protect water bodies, and minimize cumulative effects on waterways	This comment was in relation to the draft Strategy #2 in the 2023 "Source Control Wastewater Treatment and Resource Recovery Discusion Paper": *Meet or exceed regulatory requirements for wastewater treatment plants, including effluent quality biosolids quality, and building codes, to meet regional needs including optimized efficiency, climate resilience, and enhanced health of local waters.* Metro Vancouver has sought to address these concerns throughout the LWMP within proposed actions in Strategy 7 - Minimize impacts of sanitary sewer overflows on human health and environment, Strategy 8: Assess combined sewer overflows' impact on receiving environment, Strategy 10: Manage rainwater and development for watershed health, Strategy 13 - Treat wastewater so effluent meets or surpasses regulatory requirements, Strategy 14: Operate and maintain wastewater treatment plants to meet or surpass regulatory requirements, and Strategy 20: Collaborate on regional environmental management initiatives.

126	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Minimizing greenhouse gas emissions and preventing re-entry of contaminants into aquatic systems or food webs	Minimizing greenhouse gas emissions and preventing contaminants from entering the environment are included in proposed actions: 14.3 (report on wastewater treatment plant bypass conditions), 15.3 (explore technologies that convert sludge to low carbon fuel), 16.1 (recover and put to use energy from liquid waste), 18.1 (track GHG emissions from the liquid waste system), 18.2 (develop and implement programs to reduce GHG emissions from teh liquid waste system).
127	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Regarding the polluter pay approach - Also integrate mechanisms to ensure that people/industries aren't simply enabled to pay to pollute.	Metro Vancouver's *Sewer Use Bylaw* regulates the discharge of contaminants and maintains lists of prohibited and restricted wastes. Discharge of these wastes are monitored and regulated, to protect human health, the environment, and our wastewater infrastructure and treatment processes. The pollutor pay approach refers to mechanisms to hold polluters responsible if they pollute, but the primary objective is to avoid discharging waste in the first place. This approach is supported in source control proposed actions: 4.1 and 4.2.
128	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	The document overall is reflecting a Eurocentric, post-colonial viewpoint; this needs to be addressed at a fundamental level in the process, and with respect to language and framing in written works. For example, the paragraph starting with "In the past, society..." is not reflective of the past from an Indigenous perspective. This statement is very specific to post-European settlement and western colonial society. The circular economy may be a term in current use, but the concept predates the linear economy espoused by the colonial/settler society. It should be explicitly acknowledged that there is much to be learned from Indigenous societies and Indigenous ways that predate the imposition of the linear economy. Acknowledging this learning opportunity up front will better enshrine the need to work closely with First Nations in the update of the LWMP.	This comment was in reference to the 2023 "Source Control Wastewater Treatment and Resource Recovery Discusion Paper". Metro Vancouver has made revisions to the draft LWMP based on this feedback and has endeavoured to reflect this feedback in more representative language throughout the draft LWMP. The draft LWMP will be shared with First Nations for their feedback on language and content.
129	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Good to see recognition of, and direct reference to, the BI WQOs here. Along with stating the challenges in this paragraph, it is important to acknowledge that all of these jurisdictions have been brought together (by səlilwətaɬ (Tsleil-Waututh Nation)) as part of the Burrard Inlet Water Quality Roundtable. Similar structures can be created by others around other water bodies and around this plan.	A key principle in the development of the updated LWMP is to be collaborative across jurisdictions. This approach is taken across many proposed actions throughout the plan. Proposed actions 20.1 and 20.2 specifically commit Metro Vancouver to participating in relevant collaborative environmental programs for regional water bodies; and, to continue to participate in the Ministry's processes to review and establish water uses and water quality objectives for specific water bodies within Metro Vancouver (such as Burrard Inlet WQOs).
130	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Regarding Indigenous perspectives being heard - Indigenous Nations must be more than heard; they must be consulted as per their own processes, and on a government to government basis, which may require that the plan be co-developed with Indigenous Nations upon their request.	The Liquid Waste Management Plan (LWMP) seeks to honour the Board's commitment to reconciliation with Indigenous Peoples and includes a proposed goal about collaborating with First Nations in regional liquid waste management: First Nations are actively involved in regional liquid waste management. Strategies and solutions reflect First Nations' priorities and respect Indigenous Knowledge and the rights of Indigenous Peoples while collaborating on areas of shared significance. The strategies and solutions in the plan reflect key themes heard during engagement with First Nations. Metro Vancouver aspires to reflect First Nations' priorities, incorporate Indigenous Knowledge, and prioritize collaborating on areas of shared significance. The Plan: • Acknowledges that liquid waste management has impacts on First Nations communities and lands • Outlines a commitment to work with First Nations to increase their influence on the projects and plans that affect their rights and interests • Recognizes First Nations have an important role in stewardship of the region's land, water, and air • Seeks to incorporate Indigenous Knowledge and actively involve First Nations in regional liquid waste management. Metro Vancouver commits to engaging with First Nations on a government-to-government basis. Under the Province's commitment to the *Declaration on the Rights of Indigenous Peoples Act* working together on the Plan and incorporating səlilwətaɬ input will

					be vital to successful development, approval, and implementation of the Plan. As the LWMP is a regulatory document that Metro Vancouver and its member jursidcations are responsible for implementing and managing, Metro Vancouver must remain its sole author, however, we will continue to collaborate with səlilwətaɬ to develop a plan that meaningfully incorporates the Nation's feedback and priorities into the Plan. This included the development of an engagement work plan for səlilwətaɬ's involvement in the LWMP update, regular monthly meetings on agreed topics of interest, and full review of the draft LWMP prior to submission to the province.
131	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Regarding stronger interest - Broader interest? Or interest from federal, provincial and local government regulators? The interest would have always been there from First Nations and other forward-thinking parties.	This comment was in reference to the 2023 "Source Control Wastewater Treatment and Resource Recovery Discusion Paper". Metro Vancouver has endeavoured to reflect this feedback in more representative and clearer language in the draft LWMP. The draft LWMP will be shared with First Nations for their feedback on language and content.
132	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Regarding the value of resource recovery, and climate change adaptation - Better use of wastewater as a resource would also support water conservation measures and reduce stresses on aquatic systems during periods of drought. Conservation measures aimed at volume reductions will also result in greater affordability at the treatment plant level, and strengthen the business case for improved wastewater systems and action at household and institutional levels. Increased frequency and intensity of storm events will also lead to more CSOs and pollution in waterways if fundamental water flow/use/management issues are not addressed.	Proposed actions in Strategy 3 - 'Use demand side management to reduce flows and loadings', incorporate this feedback on conservation measures and subsequent reductions in flow volumes resulting in greater affordability at the treatment plant level. Proposed actions in Strategy 5 - 'Reduce rainfall-derived inflow and infiltration into private lateral sewers' help to keep sanitary sewer and treatment plant capacity for sewage (deferring the need for expansions), reduce overflows, and increase the system's resilience to storm events. In support of this feedback, proposed action 6.4 requires a review of wet weather pricing to incentivize actions that make sanitary sewers more water-tight. Better use of wastewater as a resource is incorporated into proposed actions 16.2, 16.4, 17.1 and 17.2 which include both continuing existing programs to recover energy or other materials from wastewater; and, piloting innovative technologies that could extract more resources.
133	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Regarding "the need for increased collaboration" - The 3 statements in this paragraph are somewhat related, but not really. The Coastal Marine Strategy is not a prime example of collaboration, for example, as there have been issues with that process. And the 3rd statement is too vague to be useful.	This comment was in reference to the 2023 "Source Control Wastewater Treatment and Resource Recovery Discusion Paper". Metro Vancouver has endeavoured to reflect this feedback in more representative and clearer language in the draft LWMP. The draft LWMP will be shared with First Nations for their feedback on language and content.
134	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Source control needs to be vastly improved across the board. See our Burrard Inlet WQOs technical documents for examples. Chemicals are coming onto the market faster than regulations are keeping up. The bureaucracy around source control is unsustainably complex compared to the urgency of the problem and how easily contaminants can enter systems. The data are showing that some 700 chemicals have been recorded in Burrard Inlet, for example, and there is currently very little understanding of what is entering the system via stormwater. We have not been provided information on metrics or evaluations pertaining to source control, wastewater treatment and resource recovery, so it has not been made possible for us to comment on what is working well.	Metro Vancouver has and will continue to closely follow scientific developments when it comes to constituents of environmental concern (CECs) and makes its monitoring data available to senior government agencies and other parties involved in the development of water quality objectives and guidelines. For many years, Metro Vancouver has been participating in Environment and Climate Change Canada's monitoring programs, which provide data and input into the Chemicals Management Plan. Metro Vancouver monitoring programs and initiatives continue to be refined and modified based on new scientific advancements, to ensure that they are up to date and forward-looking. Metro Vancouver's monitoring, modeling, and risk assessment work will continue in the future. Metro Vancouver advocates to other orders of government to encourage expanded research and regulation for CECs, and has provided data on per- and polyfluoroalkyl substances (PFAS) and other constituents of interest. As with other liquid waste management operators in the country, Metro Vancouver focuses on substances for which Environmental Quality Guidelines exist. Metro Vancouver and members will share data with First Nations. Proposed action 4.1 lends support to this feedback, as well as action 10.1.,10.2, and 12.1

135	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Has a thorough evaluation of this been done to determine effectiveness and gaps?	Metro Vancouver takes a risk-based approach to managing contaminants and focuses efforts on what's causing greatest harm to receiving ecosystems. Source control strategies are continuously improved based on needs, with Metro Vancouver dedicating resources to addressing acute issues as they arise. Longer-term planning is also done to proactively prevent and reduce source concerns where possible. Part of continuous improvement efforts are to examine effectiveness and gaps, so that we can continue focusing efforts where needed, adapt based on lessons learned, and alter or enhance approaches where needed.
136	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	How effective have these been? Will industry change their practices based on a guide? Regulations are needed to change industrial behaviour.	Metro Vancouver has found that education and awareness programs can be very effective. For example, the annual Unflushables campaign has resulted in measurable decreases in de-ragging (clearing clogs caused by unflushable items) needs at MV pump stations. Metro Vancouver tracks analytics on its campaigns, and will often follow-up with post-campaign surveys to assess their efficacy. For example, the fall 2022 Switch to Cold, Our Ocean Thanks You campaign: - generated 14 million impressions from digital tactics and billboards - the public service announcement (PSA) video aired 1,870 times on Telus and Shaw, reaching an estimated 911,000 residents, while radio ads aired 1,653 times - The campaign reached 266,000 residents through digital channels - Video ads received over 1 million views through Facebook, Instagram, YouTube, and digital TV placements - Social media generated 125 engagements (likes, shares, saves, comments) - 3,900 people visited the webpage (switchtocold.ca) from September 12 to October 30The post-campaign survey of 504 adults showed that: - 29% of parents recalled seeing at least one campaign ad - 22% of parents talked to others about the campaign's message - Of those who saw the advertising while it was in market, 42% said they are washing more loads in cold water - Most people surveyed found that the campaign reinforced the importance of washing in cold water (87%) and that they learned something new about the impacts of microfibre shedding (63%Key considerations for successful education and awareness strategies are to understand what the public or industries are currently doing and why, what motivates them, and ways to make it easier for people to engage in habits that are better for the wastewater system and environment. For industrial behaviour change, education and regulations go hand in hand. Many residents and businesses want to do the right thing, but we also need to have rules and consequences in place for violations. Regulations and incentives are also effective source control approaches. Proposed actions in Strategy 3 and 4 propose multiple actions in this area, such as improving regulations, fees, bylaws, and educational materials to reduce discharges from residential, commercial and industrial sectors.
137	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Such as what, and by whom?	Strengthening source control programs is an ongoing initiative for MV. Existing examples of source control campaigns and advocacy include: • Campaigns: microfibres, unflushables (pharmaceuticals, wipes) microplastics, surfactants https://metrovancouver.org/services/liquidwaste/Pages/campaign-materials.aspx • Assessing entry pathways/sources of CECs (pharmaceuticals, PFAS, flame retardants, pesticides) • Ongoing advocacy to other orders of government for policy approaches that hold producers (i.e., manufacturers of consumer goods) accountable for the downstream environmental impacts of their products • Input to Ministry of Environment and Climate Change Canada's approach to addressing PFAS as a class of compounds • Input to province on amendment to Recycling Regulation • Participation in Canada Plastics Pact Proposed actions in Strategy 4 address this səlilwətaɬ feedback. Specifically, proposed action 4.1 (Metro Vancouver will prioritize contaminants for source control using the Canadian Council of Ministers of Environment (CCME) Canada-wide Strategy for Management of Municipal Wastewater Effluent (CWS-MMWE) Risk Management Decision Framework. Metro Vancouver will take further source control actions such as educating target sectors to reduce discharges, advocating for increased provincial and federal regulations on the manufacturing and use of products with contaminants, and updating Metro Vancouver's bylaws for industrial and commercial dischargers. Metro Vancouver will work with First Nations as desired on advocating for increased provincial and federal regulations on the manufacturing and use of products with contaminants.)

138	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Point 2: What kind of infrastructure?	This was a question about what kind of infrastructure was being referenced in the 2023 "Source Control Wastewater Treatment and Resource Recovery Discusion Paper" on page 8 (was referring to protecting liquid waste infrastructure from fat from residential and commercial sources that can build up and cause damage and overflows). Proposed actions in Strategy 3 aim to expand education to residents, work with businesses to prevent grease from entering sewers, and pursue reductions in industrial wastewater flow and loading.
139	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Question 1: See our list of prioritized parameters for the Burrard Inlet Water Quality Objectives (we can provide you an updated list upon request, as we are building on it over the course of the next several months). There is a need to address a wide range of contaminants of emerging concern, endocrine disruptors, carcinogens. Start with the most toxic and most pervasive? This also requires a systemic shift to precautionary principle before contaminants are allowed into the system - reverse the bureaucracy so that entry of contaminants faces roadblocks and regulations and elimination of contaminants becomes a simplified process. Local and regional governments must advocate and call on provincial and federal governments to do better. You have the opportunity of multi-jurisdictional support behind calls for other jurisdictions to take the upstream action required to enable environmental protection by Metro Vancouver at end of pipe - multi-jurisdictional, collective statements can be very powerful and carry a lot of weight.	In the updated LWMP, proposed Strategy 4 incorporates this feedback. Specifically, proposed action 4.1 includes plans to advocate for increased provincial and federal regulations on the manufacturing and use of products with contaminants and to work with First Nations on advocating for increased provincial and federal regulations.
140	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Question 2: Make direct links to human health. Be clear on what is in an individual's control, particularly someone with few resources. Regulators should take action on a higher level for pollutant reduction.	Metro Vancouver's education campaigns aim to engage residents on actions they can take to improve water quality. Metro Vancouver will continue to find ways to add to and enhance its public education on source control. This feedback is incorporated in the LWMP in proposed action 4.2 that commits Metro Vancouver and members to continue public education and outreach programs and work with First Nations on such outreach and education. In proposed action 4.1, Metro Vancouver commits to take further source control actions such as educating target sectors to reduce discharges, advocating for increased provincial and federal regulations on the manufacturing and use of products with contaminants, and updating Metro Vancouver's bylaws for industrial and commercial dischargers. Metro Vancouver will work with First Nations on advocating for increased provincial and federal regulations on the manufacturing and use of products with contaminants.
141	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Point 1: And ensure that effluent water quality meets the Burrard Inlet Water Quality Objectives in order to minimize cumulative effects	Proposed actions in strategy 13 and proposed action 14.1 explain how Metro Vancouver meets regulatory requirements for wastewater treatment plants. The Canadian Council of Ministers of the Environment (CCME) Canada-wide Strategy for Management of Municipal Wastewater (CWS-MMWE) process sets site-specific effluent discharge objectives for all national (including Metro Vancouver) wastewater treatment plants. These are based on meeting all applicable water quality objectives and guidelines for the specific receiving water body, such as the Burrard Inlet Water Quality Objectives. When the federal or provincial governments review these water quality objectives and guidelines, First Nations are invited by the presiding government to provide input, and can provide direct feedback for specific receiving waters. Through ongoing monitoring and assessment programs this prescribed process may lead to actions such as source control initiatives, treatment process optimization and treatment plant improvements and upgrades. We will aim to add a description to the LWMP of səlilwətaɬ's work on the BIWQOs and how Metro Vancouver is using the objectives. We would like to work with səlilwətaɬ on to develop this content (whether it is added as a 'call-out box' or in some other form).

142	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Question 1: Indigenous rights and priorities	Metro Vancouver is and will continue working with First Nations to ensure that their priorities and interests are reflected when determining regional needs for wastewater treatment beyond current regulations. Metro Vancouver will engage with First Nations on planned wastewater treatment upgrades using a newly created Wastewater Treatment Plant Upgrade and Expansion Schedule. This is described in proposed action 13.4 b.
143	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Question 3: Source control at municipally managed and regulated properties. Better support of and work with First Nations upon whose territories they are.	This was referencing a question in the 2023 "Source Control Wastewater Treatment and Resource Recovery Discusion Paper": "What can member jurisdictions do to support wastewater treatment and protect the environment?" Reducing flows and loads at the source are important actions member jurisdictions can take to support effective wastewater treatment and protect the environment. This feedback is incorporated and/or addressed in proposed actions under Strategy 3, 4, 5, 7, 8, 9, 10, 11, 12, and 20.
144	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Question 4: Whole system approach, including habitat. Volume reductions at the source via infrastructure change and incentives/disincentives.	The following proposed actions address growth, reducing demands on the liquid waste system at the source, managing inflow and infiltration, ensuring no new combined sewers are constructed, and removing extraneous flows (such as from creeks, lakes, etc.) from combined or sanitary sewers: 1.2, 3.1, 3.2, 3.3, 3.5, 5.1, 5.2, 5.3, 5.4, 5.5, 6.4, 9.1, 9.6
145	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	The linear model associated with post-colonial-settlement (this model is not "traditional" from an Indigenous lens)	This feedback informed language used to describe the 'circular economy' and 'circular water economy' in the draft LWMP to avoid use of the word 'traditional' to describe linear models.
146	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	There is a lot of repetition in this paper	Comment was based on 2023 "Source Control Wastewater Treatment and Resource Recovery Discusion Paper". We have sought to make the draft LWMP and other materials less repetitive.
147	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Question 2: High heat destroys bacteria, but what other contaminants are found in biosolids (e.g. pharmaceuticals) and are they eliminated prior to reuse? If not, then biosolids are a possible means of reentry of contaminants into the food web/aquatic systems. During the March 29 meeting it was mentioned that the concentration of ibuprofen is far below the concentration in a single pill, but what about the concentrations of other pharmaceuticals, microplastics or other contaminants of emerging concern, and how do they compare to soil, sediment, water and tissue	Proposed actions 4.1 and 4.2 address CECs. As a best practice, Metro Vancouver informs First Nations of biosolids applications within their traditional territories.

				benchmarks? First Nations need to be informed of these data, in advance of these products being applied within their traditional territories.	
148	səlilwətaɬ (Tsleil-Waututh Nation) Source Control Wastewater Recovery Comment Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2023	Question 1: Report out as per requests by First Nations; assume that First Nations want to know early enough in the process so that adaptive management can reflect their priorities and concerns. Evaluation metrics should be designed with First Nations so that they are inherently designed to meet First Nation needs. Success of Lions Gate/North Shore WWTP = effluent meets or is better than Burrard Inlet WQOs (which are being designed to protect collectively articulated values, founded on Indigenous values).	Proposed action 13.2 commits Metro Vancouver to continue to monitor the quantity and characteristics of wastewater treatment plant effluent discharges and assess effluent quality in accordance with the Canadian Council of Ministers of Environment Canada-wide Strategy for Management of Municipal Wastewater (CCME CWS-MMWW) which includes consideration of the relevant water quality objectives for each receiving environment, and in the case of Burrard Inlet, these are the BIWQOs. Proposed action 20.2 includes Metro Vancouver and members participating in the Ministry's processes to review and establish water uses and water quality objectives for specific water bodies within Metro Vancouver. We will aim to add a description to the LWMP of səlilwətaɬ's work on the BIWQOs and how Metro Vancouver is using the objectives. We would like to work with səlilwətaɬ on to develop this content (whether it is added as a 'call-out box' or in some other form).
149	səlilwətaɬ (Tsleil-Waututh Nation) Meeting #2 LWMP Follow-up Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 4, 2023	səlilwətaɬ (Tsleil-Waututh Nation)continues to have concerns about the level of engagement on Phases 1 and 2 of the LWMP review and update.	As a result of this feedback, Metro Vancouver developed an engagement workplan specifically for səlilwətaɬ (Tsleil-Waututh Nation), entered into an engagement agreement with the Nation, and commenced monthly meetings on the content for the draft LWMP in April 2024.
150	səlilwətaɬ (Tsleil-Waututh Nation) Meeting #2 LWMP Follow-up Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 4, 2023	What guarantees are there from MV that First Nations input will be incorporated in a meaningful way into the next plan? Where will space be made for input and decision-making, when səlilwətaɬ(Tsleil-Waututh Nation) is not in the decisionmaking structure at MV?	Metro Vancouver seeks to engage meaningfully with First Nations on the Liquid Waste Management Plan by facilitating dialogue and incorporating input into the Plan to the greatest extent possible. Engagement is tailored to each First Nation's unique needs and preferences. We work with First Nations, as government partners and rights-holders, in a collaborative manner on the Plan and value their input in the following ways:• Metro Vancouver takes time to properly consider and discuss how to best reflect First Nations' input in the Plan• First Nations' input is prioritized by being presented directly to senior management for consideration • Metro Vancouver reports back to First Nations with a summary of how feedback was incorporated into the Plan and reasons for not including certain feedback• First Nations are able to present thoughts or recommendations on the Plan directly to the Metro Vancouver Liquid Waste Committee and/or Board as a delegation. • First Nations engagement is a regulatory requirement of the Liquid Waste Management Plan. The Province will review Metro Vancouver's records of engagement with First Nations, including what we have heard from First Nations, and what we are doing to address their specific concerns and to reflect their priorities in order to approve the Plan.Metro Vancouver supported the Nation's interest in deep engagement on the LWMP and have been meeting monthly with səlilwətaɬ (Tsleil-Waututh Nation) on the LWMP update, sharing draft strategies and actions for their input since April 2024.
151	səlilwətaɬ (Tsleil-Waututh Nation) Meeting #2 LWMP Follow-up Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 4, 2023	səlilwətaɬ (Tsleil-Waututh Nation) wants more opportunities to be actively involved in the development of content for the next plan. The Nation does not want to just receive a draft of the plan for input in Phase 3.	As a result of this feedback, Metro Vancouver developed an engagement workplan specifically for səlilwətaɬ (Tsleil-Waututh Nation), entered into an engagement agreement with the Nation and commenced monthly meetings on the content for the draft LWMP in April 2024.
152	səlilwətaɬ (Tsleil-Waututh Nation) Meeting #2 LWMP Follow-up Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 4, 2023	Some of the things səlilwətaɬ (Tsleil-Waututh Nation)are suggesting as part of LWMP feedback will be challenging – if input isn't easy to address, what happens then?	The LWMP is a regulatory document with a limited regional scope, and some input may not fall under the jurisdiction of the LWMP. Metro Vancouver welcomes the Nation's input on how to address input that is outside of the scope of the LWMP update.

153	səlilwətaɬ (Tsleil-Waututh Nation) Meeting #2 LWMP Follow-up Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 4, 2023	How exactly will the Burrard Inlet Water Quality Objectives be incorporated into the plan? Standards need to be applied or benchmarks provided so there will be an obligation for the region/municipalities to meet them. We are looking to have the objectives enshrined into the system more effectively.	Proposed action 13.2 commits Metro Vancouver to continue to monitor the quantity and characteristics of wastewater treatment plant effluent discharges and assess effluent quality in accordance with the Canadian Council of Ministers of Environment Canada-wide Strategy for Management of Municipal Wastewater (CCME CWS-MMWW) which includes consideration of the relevant water quality objectives for each receiving environment, and in the case of Burrard Inlet, these are the BIWQOs. Proposed action 20.2 commits Metro Vancouver to continue to participate in the Ministry's processes to review and establish water uses and water quality objectives for specific water bodies within Metro Vancouver. We will aim to add a description to the LWMP of səlilwətaɬ's work on the BIWQOs and how Metro Vancouver is using the objectives. We would like to work with səlilwətaɬ on to develop this content (whether it is added as a 'call-out box' or in some other form).
154	səlilwətaɬ (Tsleil-Waututh Nation) Meeting #2 LWMP Follow-up Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 4, 2023	Request for information on how Metro Vancouver (MV) sets up its matching system for the beneficial use of biosolids.	Metro Vancouver provided the following response to səlilwətaɬ (Tsleil-Waututh Nation): Metro Vancouver has a Standing Request for Expressions of Interest posted on its bids and tenders page. This is a standing open call for anyone with a project idea to propose a biosolids management solution. This is a more recent approach (over the last seven years). In the past, the vast majority of projects were developed by creating connections with mines, contractors, and municipalities. Metro Vancouver attended industry conferences to find projects that would be a good fit, and developed relationships over time. Often new projects would be born out of old projects or connections made by existing contacts. MV staff would be happy to discuss further, if more information would be helpful.
155	səlilwətaɬ (Tsleil-Waututh Nation) Meeting #2 LWMP Follow-up Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 4, 2023	Request for MV to develop an LWMP engagement workplan for səlilwətaɬ (səlilwətaɬ (Tsleil-Waututh Nation)) input that outlines: 1. How First Nations feedback will be considered and integrated into the next plan 2. How decisions about the next plan will be made 3. Specific opportunities for First Nations engagement in Phase 2/Phase 3	As a result of this feedback, Metro Vancouver developed an engagement workplan specifically for səlilwətaɬ (Tsleil-Waututh Nation), incorporating the items noted. Metro Vancouver entered into an engagement agreement with the Nation and commenced monthly meetings on the content for the draft LWMP in April 2024.
156	səlilwətaɬ (Tsleil-Waututh Nation) Meeting #2 LWMP Follow-up Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 4, 2023	Request for a more detailed explanation of how the plan will be developed and how səlilwətaɬ (Tsleil-Waututh Nation)feedback will be incorporated into the plan.	As a result of this feedback, Metro Vancouver developed an engagement workplan specifically for səlilwətaɬ (Tsleil-Waututh Nation), which outlined the process for plan development. Metro Vancouver entered into an engagement agreement with the Nation and commenced monthly meetings on the content for the draft LWMP in April 2024, and through these discussions, meeting reponse tables, and this comment/response table, we have sought to explain how səlilwətaɬ feedback has been incorporated into the plan.
157	səlilwətaɬ (Tsleil-Waututh Nation) Meeting #2 LWMP Follow-up Response Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 4, 2023	Request for more details in comment-response tables, specifically requesting that more information be given than "Comment noted".	As a result of this feedback, Metro Vancouver has stopped responding with "comment noted" and sought to provide detailed responses to all comments.
158	Shared Waters Alliance - Roundtable Meeting Summary	Semiahmoo	Jun 29, 2023	The Roundtable was supportive of the proposed principle.	
159	Shared Waters Alliance - Roundtable Meeting Summary	Semiahmoo	Jun 29, 2023	It was noted in response to the LWMP plan updates, that Semiahmoo First Nation and many other First Nations do not have a formal seat at the table with Metro Vancouver with the current governance structure. This has resulted in poor or limited representation for First Nations' interests.	The Liquid Waste Management Plan (LWMP) seeks to honour the Board's commitment to reconciliation with Indigenous Peoples and includes a proposed goal about collaborating with First Nations in regional liquid waste management: First Nations are actively involved in regional liquid waste management. Strategies and solutions reflect First Nations' priorities and respect Indigenous Knowledge and the Rights of Indigenous Peoples while collaborating on areas of shared significance. The strategies and solutions in the plan reflect key themes heard during engagement with First Nations. Metro Vancouver aspires to reflect First Nations' priorities, incorporate Indigenous Knowledge, and prioritize collaborating on areas of shared significance. The Plan: • Acknowledges that liquid waste management has impacts on First Nations communities and lands

					• Outlines a commitment to work with First Nations to increase their influence on the projects and plans that affect their rights and interests • Recognizes First Nations have an important role in stewardship of the region's land, water, and air • Seeks to incorporate Indigenous Knowledge and actively involve First Nations in regional liquid waste management
160	Shared Waters Alliance - Roundtable Meeting Summary	Semiahmoo	Jun 29, 2023	The challenges of the past and present for limited First Nations representation and engagement need to be overcome; a shift appears to have started through Metro Vancouver's recent leaders gathering, but more work is needed and better representation is important.	The Liquid Waste Management Plan (LWMP) seeks to honour the Board's commitment to reconciliation with Indigenous Peoples and includes a proposed goal about collaborating with First Nations in regional liquid waste management: First Nations are actively involved in regional liquid waste management. Strategies and solutions reflect First Nations' priorities and respect Indigenous Knowledge and the Rights of Indigenous Peoples while collaborating on areas of shared significance. The strategies and solutions in the plan reflect key themes heard during engagement with First Nations. Metro Vancouver aspires to reflect First Nations' priorities, incorporate Indigenous Knowledge, and prioritize collaborating on areas of shared significance. The Plan: • Acknowledges that liquid waste management has impacts on First Nations communities and lands • Outlines a commitment to work with First Nations to increase their influence on the projects and plans that affect their rights and interests • Recognizes First Nations have an important role in stewardship of the region's land, water, and air • Seeks to incorporate Indigenous Knowledge and actively involve First Nations in regional liquid waste management Proposed actions across the LWMP aim to address this feedback: 1.3, 4.1, 9.2, 10.1, 10.2, 12.4, 13.4, 17.1
161	kʷikʷəƛ̓əm (Kwikwetlem First Nation) LWMP Meeting #1 Follow-Up Responses	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Jul 4, 2023	Support for a more streamlined Biennial Report on the actions of the Liquid Waste Management Plan, as long as it contains data that is meaningful and useful to kʷikʷəƛ̓əm (Kwikwetlem First Nation) and other end users. Noted that the detailed data in the Biennial Report, if it can show trends over time, would still be useful for those interested in doing a deeper dive into the information. Question about what a performance dashboard might look like.	The proposed approach for reporting is described in the 'Monitoring and Reporting' section of the LWMP. It proposes to annually report, via an 'LWMP Dashboard', a list of Performance Metrics (as shown in Appendix B). It also indicates there will be a streamlined annual report that will contain an annual 'Action Status Table' and additional context and insights to report on Metro Vancouver and members' progress on all LWMP actions (i.e., 'Complete'; 'In Progress'; or 'Not Started'). Additionally, proposed actions 6.1 and 6.2 commit members to the creation of inflow and infilration dashboards that will be updated annually and reported publicly; and, proposed action 11.3 commits members to the implementation of rainwater dashboards with rainwater management and watershed health performance metrics that will be shared online.
162	kʷikʷəƛ̓əm (Kwikwetlem First Nation) LWMP Meeting #1 Follow-Up Responses	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Jul 4, 2023	Question about what type of wastewater contaminant data Metro Vancouver currently shares.	Metro Vancouver's wastewater treatment plant influent and effluent data and receiving environment monitoring reports and Environmental Management and Quality Control (EMQC) Annual Reports for the last five years can be found at: https://metrovancouver.org/services/liquid-waste/reports-and-resources. In the updated LWMP, Metro Vancouver and members commit to reporting on LWMP Performance Indicators, Appendix B, via an 'LWMP Dashboard' (see 'Monitoring and Reporting' section). Several proposed actions commit to sharing data publicly: see proposed actions 6.2 (members will publicly report I&I dashboard data), 8.5 (changes in receiving environment due to measures taken on CSOs will be reported in the EMQC Annual Report), 11.3 (members will implement online rainwater dashboards), 13.1-13.4 (Performance Indicators: influent and effluent quantity and characteristics will continue to be reported in the EMQC Annual Report), and 19.2 (share seasonal beach monitoring information with municipal beach operators and local Health Authorities).
163	kʷikʷəƛ̓əm (Kwikwetlem First Nation) LWMP Meeting #1 Follow-Up Responses	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Jul 4, 2023	Question about who is responsible for sewer separation work. Request that First Nation's archaeology and cultural heritage be addressed before ground disturbance.	Separation of combined sewers is the responsibility of system owners - Metro Vancouver and member jurisdictions with combined sewers (Cities of Burnaby, New Westminster and Vancouver). In conjunction, separation of combined service connection on individual properties is also required. Archeological considerations are outside the scope of the LWMP, however, as a standardized practice, Metro Vancouver considers archaeology on all projects and initiatives which involve ground-disturbing works.

164	kʷikʷəƛ̓əm (Kwikwetlem First Nation) LWMP Meeting #1 Follow-Up Responses	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Jul 4, 2023	Question about what work is happening at or near the outflows of combined sewer overflows (CSOs) to reduce contaminants entering the water while sewer separation work is underway.Request for green infrastructure methods to be considered near overflows or outfalls that could help filter out contaminants before they enter either the combined sewer system, or receiving waters.	Currently CSOs are not treated. The overall strategy of combined sewer separation (see proposed actions in Strategy 9) should drastically reduce the amount of stormwater in the system, which is a significant cause of combined sewer overflows. Metro Vancouver and its member municipalities with combined sewers are working to eliminate combined sewer overflows that occur as a result of wet weather through combined sewer separation. In the interim,while sewers are not yet fully separated, proposed actions in Strategy 8 will help to assess, reduce, and mitigate the impacts of CSOs on receiving environments. Green Infrastructure (GI), as a complement to grey infrastructure (e.g. pipes and sewers), can help to improve stormwater quality and quantity. Proposed actions that incorporate green infrastructures are 10.5, 11.4, and 12.3.
165	kʷikʷəƛ̓əm (Kwikwetlem First Nation) LWMP Meeting #1 Follow-Up Responses	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Jul 4, 2023	Request for public education, particularly around the importance of protecting storm drains (e.g. from household and landscaping chemicals) and source control actions, to be included in the next plan.	Metro Vancouver has several source control education initiatives already in place https://metrovancouver.org/services/liquid-waste/campaign-materials. We know that education is a key component to improving water quality in the region and the following proposed actions lend support to this feedback: 3.1, 4.2, 5.1, 12.1
166	kʷikʷəƛ̓əm (Kwikwetlem First Nation) LWMP Meeting #1 Follow-Up Responses	kʷikʷəƛ̓əm (Kwikwetlem First Nation)	Jul 4, 2023	Support for continuing to use current engagement methods (1-1 meetings with kʷikʷəƛ̓əm (Kwikwetlem First Nation), feedback on written materials, and workshops with member jurisdictions and others) for engagement on Phase 3 (developing content for the next plan).	Metro Vancouver will continue to provide 1-1 meetings and provide the draft plan for written feedback as part of continued engagement on the next LWMP. Metro Vancouver will develop a similar scope of work and funding for Phase 3 engagement (on the draft plan) and send to kʷikʷəƛ̓əm (Kwikwetlem First Nation) for their input.
167	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) written response to LWMP discussion papers	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Nov 7, 2023	We are pleased to see the sustainability and healthy water considerations laid out in these strategies. The Nation would like to see Metro Vancouver take a stronger stance on creating and enforcing regulations related to source control and stormwater/liquid waste discharge.	Metro Vancouver's source control regulatory abilities are for sanitary wastewater. Regulatory oversight in regards to stormwater is within the jurisdiction of other orders of government (i.e federal, provincial, municipal). Proposed actions related to source control that lend support to this feedback are: 3.1, 3.2, 3.3, 4.1, 4.2 Metro Vancouver will continue and increase efforts as a regional convener on stormwater issues and encourage municipalities to take action on stormwater management under strategies 10, 11, and 12.
168	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) written response to LWMP discussion papers	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Nov 7, 2023	A few things we felt were missing include: -Strong regulation for industry, public, and private sectors on source control including microplastics and other emerging contaminants.	Proposed action 3.1 commits Metro Vancouver to pursue reductions in residential wastewater flow and loading through improving education and awareness, starting with encouraging less food waste disposal down drains. Proposed actions 3.2, 3.3, 3.4 address the regulation and reduction of wastewater discharges from businesses, industry and restaurants. Proposed action 4.1 commits Metro Vancouver to prioritize contaminants for source control using the Canadian Council of Ministers of Environment (CCME) Canada-wide Strategy for Management of Municipal Wastewater Effluent (CWS-MMWE) Risk Management Decision Framework. Metro Vancouver will take further source control actions such as educating target sectors to reduce discharges, advocating for increased provincial and federal regulations on the manufacturing and use of products with contaminants, and updating Metro Vancouver's bylaws for industrial and commercial dischargers. Metro Vancouver will work with First Nations on advocating for increased provincial and federal regulations on the manufacturing and use of products with contaminants.
169	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) written response to LWMP discussion papers	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Nov 7, 2023	The plan needs strong regulation at outfalls of storm system to minimize all contaminants into downstream receiving environments, future storm system upgrades should ensure full treatment at or before discharge point, and MV should require all municipalities to upgrade existing discharge points for full treatment (as well as to ensure downstream flows are managed to pre-development levels in all scenarios)	The regulation of stormwater discharges rests with senior levels of government, while the management of stormwater falls, for the most part, under the jurisdiction of local municipalities. These kinds of actions would best be led by individual municipalities, as the local authority that would have to design, plan, operate, and fund them. In the LWMP, local municipalities have the option to include treatment options within their Integrated Watershed Management Plans (IWMPs). The updated LWMP recognizes green infrastructure as an a important aspect of rainwater management as it mimics natural watersheds, reduces runoff and discharge, improves water quality and increases climate resilience. Proposed Actions 10.5 and 11.4 encourage the expanded use of green infrastructure.

170	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) written response to LWMP discussion papers	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Nov 7, 2023	All treatment plans need to ensure advanced odour control especially near Capilano reserve as there are continued complaints from residents	Metro Vancouver understands that odour is a concern for community members living near wastewater treatment plants. After hearing from Sḵwx̱wú7mesh Úxwumixw and meeting with the Nation's Emergency Planning and Response team, Metro Vancouver has committed to the following, in addition to existing odour control programs:• An automatic odour assessment by a consultant for the Lions Gate wastewater treatment plant on receipt of any future odour complaints from Sḵwx̱wú7mesh Úxwumixw or surrounding community. Results of the assessments can be shared with the Nation. For awareness, vital maintenance work on the plant must occur annually, and must be done when the water flows are low in the summer. The maintenance work takes approximately one week and involves scrubbing and cleaning the tanks, which can increase the odours in the area. To minimize the impact of this work to the Sḵwx̱wú7mesh Úxwumixw community, Metro Vancouver has agreed with Sḵwx̱wú7mesh Úxwumixw to schedule a follow-up meeting in spring 2024 to share the 2024 maintenance schedule, and for Sḵwx̱wú7mesh Úxwumixw to provide a schedule of their large events or ceremonies in the surrounding area, so that the timing of maintenance work can be considered. Metro Vancouver takes Sḵwx̱wú7mesh Úxwumixw concerns seriously and as a result, the design of the North Shore Wastewater Treatment Plant includes containment of odours by physical covers, 2-stage treatment of these odours (via biotowers and activated carbon polishing units), and dispersion of treated air from a stack to further minimize impacts to the community.Proposed action 18.5 commits Metro Vancouver to the continuation of these types of activities into the future (Metro Vancouver will continue odour management programs at wastewater treatment plants and targeted facilities in the regional sewer system. These programs are driven by community acceptance and industry best practices, and are designed to: establish the current odour levels through monitoring; set targets for future odour levels through modelling; and, identify and implement the steps to achieve the targets through mitigation.)
171	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 1: Stormwater* Consider treatment options at outfalls and further upstream	The regulation of stormwater discharges rests with senior levels of government, while the management of stormwater falls, for the most part, under the jurisdiction of local municipalities. These kinds of actions would best be led by individual municipalities, as the local authority that would have to design, plan, operate, and fund them. Local municipalities already have the option to include treatment options within their Integrated Watershed Management Plans (IWMPs). The updated LWMP recognizes green infrastructure as an a important aspect of rainwater management as it mimics natural watersheds, reduces runoff and discharge, improves water quality and increases climate resilience. Proposed Actions 10.5 and 11.4 encourage the expanded use of green infrastructure.
172	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 1: Stormwater* Make sure member jurisdictions are held to the highest possible standards on stormwater outfalls	Prescriptive provincial or federal thresholds for stormwater discharge quality have yet to be developed, and it would be the Province's responsibility to set them for BC's regional districts and municipalities. Should the Province establish stormwater discharge thresholds, Metro Vancouver will ensure that the region and member jurisdictions align their policies and bylaws with those regulations. Meanwhile, both Metro Vancouver and members are striving to improve stormwater quality through the development and implementation of Integrated Watershed Management Plans, and monitoring and improving the outcomes of IWMP actions through the Adaptive Management Framework.Proposed actions: 10.1, 10.2, 10.4, 11.3, 12.1, 12.4 aim to expand the use of IWMPs, the AMF, municipal land use planning, and a regional rainwater interagency liaison group to improve watershed health within the scope of the LWMP.
173	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 1: Stormwater* Prioritize highly valued locations/outcomes relevant to community members (Capilano River, Seymour River, Burrard Inlet)	Proposed rainwater management action 10.2a incorporates this feedback, proposing that members prioritize watersheds within Integrated Watershed Management Plan development with First Nations, using AMF criteria and additional criteria co-developed with First Nations that consider cultural significance and Aboriginal rights and interests.
174	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 1: Stormwater* In reference to the Liquid Waste Management Plan requiring members to engage with affected First Nations on the development or update of their Integrated Stormwater Management Plans (ISMPs) – support for this, but due to limited capacity, funding would need to be provided for First Nation participation	We have heard that First Nations capacity is stretched due to the high number of project referrals each year. We understand that many municipalities are already offering engagement funding for First Nations to take part in projects and plans that affect their communities, and all municipalities are aware that First Nations engagement funding is an increasingly common and best practice. Metro Vancouver will continue to share the message with member jurisdictions that engagement funding for First Nations involvement in Integrated Watershed Management Plans will be an important component of participation. Proposed Actions lend support to this feedback: 10.2 and 12.4

175	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting : What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) Nation	Jan 31, 2024	*Theme 2: Updating stormwater/sewer infrastructure* Metro Vancouver is doing a good job at building new infrastructure but community members are concerned about the existing sewer system. Prioritize upgrading parts of the system that impact fish bearing streams and Burrard Inlet. Members also fish in the Capilano, Seymour, and Fraser Rivers.	Metro Vancouver takes an ecological and human health risk-based approach when considering upgrading or replacing parts of the existing system. Also considered are other factors such as remaining lifespan of the infrastructure, population growth and the need for expanded sewer capacity. Proposed action 1.1 commits Metro Vancouver and members to maintain the condition and performance of the sewerage system to serve a growing population in a changing climate.
176	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting : What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 3: Wastewater treatment*The Sḵwx̱wú7mesh Úxwumixw community's priority is the output of clean water. Community members want to see the highest level of treatment (i.e. tertiary)	Metro Vancouver follows the nationally developed and accepted risk assessment approach established by the Canadian Council of Ministers of Environment Canada-wide Strategy for Management of Municipal Wastewater (CCME CWS-MMWW) to determine effluent discharge objectives and meet National Performance Standards. This prescribed process may lead to actions such as source control initiatives and/or wastewater treatment plan improvements/design criteria for upgrades. Sḵwx̱wú7mesh Úxwumixw can influence wastewater treatment discharge quality by participating in federal and provincial reviews of Water Quality Objectives and Guidelines (WQO/WQG) when they occur. The CCME CWS-MMWE process sets the site specific effluent discharge objectives that Metro Vancouver wastewater treatment plants aim to meet. These are based on meeting the relevant receiving water WQO/WQGs. When the federal or provincial governments review these WQO/WQGs, First Nations are invited by the presiding government to provide input, and can provide direct feedback on water quality objectives for specific receiving waters.We have heard that level of treatment and advanced wastewater treatment processes are of key importance to Sḵwx̱wú7mesh Úxwumixw. In response, the next LWMP includes a schedule of major wastewater treatment plant upgrades and associated regulatory authorizations, which will increase transparency and improve the engagement process for First Nations provide input on wastewater treatment plant upgrades. Proposed actions in the LWMP that describe how wastewater treatment plants will be designed, operated, maintained, upgraded, and effluent and receiving environment monitored are: 13.1, 13.2, 13.3, 13.4, 14.1, 14.2.
177	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting : What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 3: Wastewater treatment* Suggestion to explore other funding models, including examples from other jurisdictions, to achieve higher levels of treatment (i.e. recouping some costs from developers)	Metro Vancouver's Finance Committee, responsible for the development of financial polices (see Terms of Reference) are continually looking for additional sources of revenue to fund improvements to the wastewater system. Finance Committee - Terms of Reference (https://metrovancouver.org/boards/Documents/FIN_TOR.pdf) Our current funding model (sources of revenue) includes several examples of "user pay" initiatives such as: • Development Cost Charges recovered from developers for new housing units that will be serviced by the Greater Vancouver Sewerage & Drainage District (GVS&DD) • Fees and charges to industrial dischargers under the Sewer Use Bylaw • Charges for customers discharging trucked liquid waste into GVS&DD sewers and facilities In addition to this, Metro Vancouver seeks equitable funding and cost-sharing agreements with the federal and provincial governments through applications to programs, such as the Investing in Canada Infrastructure Program and the Disaster Mitigation and Adaptation Funds, and commitments, such as the Province's 2023 investment of $250 million to Phase 1 of the Iona Island Wastewater Treatment Plant Project.

178	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting : What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) Nation	Jan 31, 2024	*Theme 4: Wastewater treatment plant odour* Include strong language in the next plan related to odour control. Odour is a daily issue for Capilano community members, particularly during hot weather	Metro Vancouver understands that odour is a concern for community members living near wastewater treatment plants. After hearing from Sḵwx̱wú7mesh Úxwumixw and meeting with the Nation's Emergency Planning and Response team, Metro Vancouver has committed to the following, in addition to existing odour control programs: • An automatic odour assessment by a consultant for the Lions Gate wastewater treatment plant on receipt of any future odour complaints from Sḵwx̱wú7mesh Úxwumixw or surrounding community. Results of the assessments can be shared with the Nation. For awareness, vital maintenance work on the plant must occur annually, and must be done when the water flows are low in the summer. The maintenance work takes approximately one week and involves scrubbing and cleaning the tanks, which can increase the odours in the area. To minimize the impact of this work to the Sḵwx̱wú7mesh Úxwumixw community, Metro Vancouver has agreed with Sḵwx̱wú7mesh Úxwumixw to schedule a follow-up meeting in spring 2024 to share the 2024 maintenance schedule, and for Sḵwx̱wú7mesh Úxwumixw to provide a schedule of their large events or ceremonies in the surrounding area, so that the timing of maintenance work can be considered. Metro Vancouver takes Sḵwx̱wú7mesh Úxwumixw concerns seriously and as a result, the design of the North Shore Wastewater Treatment Plant includes containment of odours by physical covers, 2-stage treatment of these odours (via biotowers and activated carbon polishing units), and dispersion of treated air from a stack to further minimize impacts to the community. Proposed action 18.5 commits Metro Vancouver to the continuation of these types of activities into the future (Metro Vancouver will continue odour management programs at wastewater treatment plants and targeted facilities in the regional sewer system. These programs are driven by community acceptance and industry best practices, and are designed to: establish the current odour levels through monitoring; set targets for future odour levels through modelling; and, identify and implement the steps to achieve the targets through mitigation.)
179	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting : What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) Nation	Jan 31, 2024	*Theme 5: Source control* Include stronger source control regulations and restrictions on industry in the next plan, especially related to pharmaceuticals and microplastics	Metro Vancouver takes a risk-based approach to managing contaminants and focuses efforts on what's causing greatest harm to receiving ecosystems. Source control strategies are continuously improved based on needs, with Metro Vancouver dedicating resources to addressing acute issues as they arise. Longer-term planning is also done to proactively prevent and reduce source concerns where possible. Part of continuous improvement efforts are to examine effectiveness and gaps, so that we can continue focusing efforts where needed, adapt based on lessons learned, and alter or enhance approaches where needed. These approaches apply to contaminants discharged by industry, as well as to contaminants such as pharmaceuticals and microplastics, which are primarily discharged from residences. Proposed actions 3.2, 3.3, 3.4 address regulations and reductions of wastewater discharges from businesses, industry and restaurants.
180	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting : What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) Nation	Jan 31, 2024	*Theme 5: Source control* Support for proposed source control actions shared in the meeting, however, suggest increasing fines for penalties	The Greater Vancouver Sewerage and Drainage District (GVS&DD) Notice of Bylaw Violation bylaw No. 378, 2024 was recently adopted (May 2024) and gives Metro Vancouver the ability to issue penalties up to $500 per incident. Metro Vancouver continues to work with the Province on creating more ticketing abilities for GVS&DD to address issues of non-compliance with liquid waste regulatory bylaws.
181	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting : What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) Nation	Jan 31, 2024	*Theme 5: Source control* Interest in and support for stronger restrictions for issuing licenses for new construction, as well as when permits and licences need to be renewed for businesses, restaurants, industries	Waste Discharge Permits are required for high volume discharges and/or restricted wastes as defined in the regional *Sewer Use Bylaw*. Metro Vancouver promotes compliance through source control efforts and inspections of permitted and regulated facilities, and enforcement of the *Sewer Use Bylaw* when needed. Discharge limits and permit conditions for new permits and permit amendments are made based on recommendations from subject matter experts, who take risk and current best practices into account. Metro Vancouver can require additional permit conditions at any time. Proposed actions in the LWMP that address regulations and reductions of wastewater discharges from businesses, industry and restaurants are actions 3.2, 3.3, 3.4

182	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) Nation	Jan 31, 2024	*Theme 5: Source control* Education campaigns/information for businesses, industry, and individual households that are free, easy to find, and include consequences to receiving environment should help make education campaigns more successful	Metro Vancouver will work to continue to improve and expand on our education campaigns, and can consider a greater focus on consequences to receiving environment, such as in the Our Ocean Thanks You campaign (https://metrovancouver.org/services/liquid-waste/campaign-materials?TermStoreId=3a6ffa4a-86cb-4ceb-8bd3-9be3deff9313&TermSetId=65e462b2-ef54-4f5c-8475-a957ae802e0e&TermId=9b21a0b7-a4d7-4df1-acdd-d4e997c7a981). This feedback is addressed in the LWMP in proposed action 4.2 (Metro Vancouver and members will continue to motivate residents and businesses to take actions that protect wastewater operations, infrastructure, and the environment. a) Metro Vancouver will continue outreach programs that include youth education programs. b) Members will continue to promote and support Metro Vancouver's regional outreach and education efforts. c) Metro Vancouver will work with First Nations as desired on such outreach and education.)
183	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) Nation	Jan 31, 2024	*Theme 6: Metrics and reporting* Consider including the following metrics: • Area that each river covers and tributaries; which rivers act as connecting body to ocean • Cultural significance to Nations • List of species in Fraser River • Salmon spawning, and note actual migrating season • Water quality • Population of fish • If river is prone to climate flooding, what is displacement/effects on breeding ground/spawning displacement • Are there any invasive species	Based on this Sḵwx̱wú7mesh Úxwumixw feedback and other First Nations' feedback, the co-development of metrics for watershed health is a proposed action in the LWMP (see action 10.2 Members will continue to develop, review and update Integrated Watershed Management Plans (IWMPs): a) Members will prioritize watersheds for IWMP development with First Nations that have chosen to participate, using AMF criteria and additional criteria co-developed with First Nations that consider cultural significance and Aboriginal rights and interests.)
184	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 6: Metrics and reporting* Funding efforts should be prioritized based on the richness of species in an area.	Biodiversity is considered when funding for capital projects is evaluated, along with public protection, other environmental considerations, feasibility, and affordability.
185	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) Nation	Jan 31, 2024	*Theme 7: Sḵwx̱wú7mesh Úxwumixw engagement* Concern that comments provided during engagement could be lost once the next plan is developed, especially with staff changes. The Liquid Waste Management Plan is a high-level plan so how will specific actions be captured?	This comment/response table contains all of the comments from Sḵwx̱wú7mesh Úxwumixw and will be shared with Metro Vancouver's Board and the Province. The project team has reviewed and considered all of the comments received during engagement and used the comments to inform the development of the draft strategies and actions. This response table aims to show how Sḵwx̱wú7mesh Úxwumixw recommendations have been integrated into the next plan or if they were not included, why not.
186	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) Nation	Jan 31, 2024	*Theme 7: Sḵwx̱wú7mesh Úxwumixw engagement* It might be helpful for Sḵwx̱wú7mesh Úxwumixw to create a values document for Metro Vancouver project teams to consider for every project, as much feedback from the community would have similar themes across many projects.	Metro Vancouver would welcome a guiding values document from Sḵwx̱wú7mesh Úxwumixw.
187	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 7: Sḵwx̱wú7mesh Úxwumixw engagement* Questions about the engagement funding and invoicing process for participating in the development of the next Liquid Waste Management Plan.	Metro Vancouver met with referrals staff from Sḵwx̱wú7mesh Úxwumixw on March 8, 2024 to discuss engagement opportunities. Meeting participants agreed on an approach for future engagement on the plan.

188	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 8: Climate Change* Suggestion to prioritize green infrastructure – "work with the environment rather than against it".	The use of green infrastructure is a key focus of the next LWMP and several proposed actions support the the enhanced use of green infrastructure. Action 10.5 Members will expand the use of green infrastructure, blue infrastructure, and other practices to mimic natural watersheds, reduce runoff and discharge, improve water quality and increase climate resilience. Action 11.2 requires members to update rainwater policies, programs, and bylaws in a harmonized manner. Metro Vancouver will coordinate the development of a guidance document to aid members in harmonizing rainwater policies, programs, and bylaws. Action 11.4 seeks to update the Master Municipal Construction Documents (MMCDs) such that green infrastructure guidelines become standards. The expanded use of green infrastrucure is a emphasized in the new LWMP. Action 12.3 requires members and Metro Vancouver to conduct a cost-benefit analysis to quantify the benefits and associated operation and maintenance costs of green infrastructure.
189	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 8: Climate Change* Climate projections vary by municipality and it would be helpful for Sḵwx̱wú7mesh Úxwumixw if Metro Vancouver could take a centralized role in preparing these projections (e.g. sea level rise).	Based on this feedback from Sḵwx̱wú7mesh Úxwumixw and others, proposed action 2.1 commits Metro Vancouver and members to collaborate with other jurisdictions and organizations to share climate data and to regularly update regional climate projections, to improve understanding of the future climate for infrastructure planning. Metro Vancouver has taken a lead role on behalf of its members in developing climate projections. See links to these reports on our website. (https://metrovancouver.org/services/liquid-waste/Documents/climate-change-2050-adjusted-idf-curves-2009.pdf) Climate Projections For Metro Vancouver (https://metrovancouver.org/services/air-quality-climate-action/Documents/climate-projections-for-metro-vancouver-2016.pdf#search=climate%20projections%20for%20metro%20vancouver)
190	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 8: Climate Change* Metro Vancouver's Drinking Water Management Plan and Liquid Waste Management Plan both impact fish habitat. Connect the dots between these two plans and ensure solutions do not block stormwater from downstream environments.	The LWMP team and DWMP team are exploring all opportunites to harmonize the plans.
191	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 8: Climate Change* Some climate risk assessments become redundant; need to look at what value assessments are bringing. In many cases, one risk assessment could extrapolate to other projects. Suggestion that Metro Vancouver play a role in developing best practice guides and recommendations for climate solutions that could apply to multiple projects.	We are currently updating climate adaptation plans for the sewerage areas. In the updated LWMP, proposed action 2.2 commits Metro Vancouver to conduct climate change and natural hazard vulnerability assessments and prepare adaptation plans for Metro Vancouver infrastructure, assets, and operations in each sewerage area to enhance resilience to future climate conditions. Based on Sḵwx̱wú7mesh Úxwumixw feedback, we can continue look at improved ways of working with our members to improve our regional approach to climate change.
192	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)	Jan 31, 2024	*Theme 9: Resource Recovery* Need to reuse stormwater and implement gray water systems to conserve drinking water.	Metro Vancouver has published the Non-Potable Water Systems Guidebook (https://metrovancouver.org/services/water/Documents/non-potable-water-systems-guidebook-2022.pdf) to support an increase in the use of stormwater and greywater in the region, to conserve drinking water. Greywater systems (also referred to as 'non-potable water systems') are not in scope for the LWMP so there are no actions associated with these systems being proposed in the LWMP. However, Metro Vancouver's Water Services department has explored this issue and included an action in the 2011 Drinking Water Management Plan (DWMP) to evaluate alternatives to potable water for specific purposes. The DWMP is currently being updated and more information about this process is available here: https://metrovancouver.org/services/water/drinking-water-management-plan
193	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation)Meeting: What We Heard Summary Table	Sḵwx̱wú7mesh Úxwumixw (Squamish Nation) Nation	Jan 31, 2024	Sḵwx̱wú7mesh Úxwumixw asked that Metro Vancouver next engage by sharing the draft plan with Sḵwx̱wú7mesh Úxwumixw when complete, during Phase 3 engagement on the LWMP, and noted that they were satisfied with their feedback on LWMP materials in Phase 2.	Metro Vancouver will share the draft plan with Sḵwx̱wú7mesh Úxwumixw for formal input when complete, during Phase 3 engagement on the LWMP.

194	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	Theme 1: BiosolidsDiscussion about scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) and Metro Vancouver's biosolids programs. Wetter versus drier biosolids; Class A versus Class B; the need to compost scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) biosolids first to attain Class A and the challenge that presents.	Metro Vancouver would be happy to discuss the pros and cons of the different approaches to biosolids and lessons learned. This more detailed discussion falls outside the scope of the LWMP, however, Metro Vancouver has provided Metro Vancouver staff contact information to scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) to discuss further as desired.
195	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	Theme 1: Biosolids scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) asked about waste-activated sludge and whether it could be sent to Metro Vancouver facilities in the event of an emergency at the scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) plant. scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) has applied for non-domestic waste permits which are expensive.	Metro Vancouver will work with scəẇaθən məsteyəxʷ (Tsawwassen First Nation) and strive to identify emergency options. Longer-term contingency options could be more challenging for Metro Vancouver to consider. Operational requests such as these fall outside of the scope of the LWMP as they are immediate and addressed on a case-by-case basis. However, we are open to learning how we can help. scəẇaθən məsteyəxʷ (Tsawwassen First Nation) was provided Metro Vancouver operations staff contacts to discuss further.
196	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	Theme 1: Biosolids scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) expressed support for the recommended options to advance and enhance biosolids use in the region, as presented.	Metro Vancouver has incorporated five proposed actions under Strategy 15 "Diversify options to beneficially use Nutrifor biosolids" that include growing the land application program, increasing public outreach and education, including to First Nations, building a regional biosolids dryer and generating pellets that will meet regulations and can be used as a low carbon fuel or fertilizer product, exploring technologies that displace the production of Nutrifor biosolids, and members continuing to use Nutrifor landscaping soil in municipal projects when feasible.
197	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	Theme 2: Resource Recovery scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) expressed support for the recommended options to advance and enhance resource recovery use in the region, as presented.	Strategies 16 and 17 address this feedback, advancing actions to promote a circular water economy.
198	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	Theme 3: Stormwater scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) noted that stormwater management is becoming increasingly more important, with stormwater runoff and pollution going unchecked into rivers and the ocean. scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) noted that they are monitoring streams more often and are looking at stormwater management plans. Question about what Metro Vancouver's Integrated Stormwater Management Plan entails.	Metro Vancouver agrees about the increasing importance of stormwater management to improve river and ocean water quality and will continue to work at the regional level and with member jurisdictions to advance actions that better manage stormwater and improve water quality. As such, the new plan proposes that members continue to develop, review and update Integrated Watershed Management Plans (IWMPs) and prioritize watersheds for IWMP development working with First Nations, using Adaptive Management Framework criteria and additional criteria co-developed with First Nations that consider cultural significance and Aboriginal rights and interests. Proposed actions 10.1 and 10.2.
199	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	Theme 3: Stormwater Discussion surrounding the following recommendation for the next LWMP: - Require members to engage affected First Nations when developing or updating Integrated Stormwater Management Plans scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) noted that rivers and watersheds cross municipal boundaries, so while scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) is surrounded by the City of Delta, the effects of Integrated Stormwater Management Plans in other municipalities would have an affect on stormwater quality in scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)).	Metro Vancouver will continue and increase efforts as a regional convener on stormwater issues to help increase intra-watershed collaboration (proposed action 12.1 and 12.4). Proposed action 11.2 will require members to update rainwater policies, programs, and bylaws in a harmonized manner to resolve rainwater policy conflicts and barriers. Proposed action 10.2 proposes that members will prioritize watersheds for Integrated Watershed Management Plan development with First Nations, using Adaptive Management Framework criteria and additional criteria co-developed with First Nations that consider cultural significance and Aboriginal rights and interests. As part of First Nations participation in IWMP development, monitoring, and review, Nations can share information about their respective land use plans as appropriate.

200	scəẃaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẃaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	Theme 3: Stormwaterscəẃaθən məsteyəxʷ (scəẃaθən məsteyəxʷ (Tsawwassen First Nation)) expressed support for the following recommended options to include in the next LWMP:- Introduce a harmonized approach to stormwater policies, bylaws, and programs- Advocate to upgrade green infrastructure(GI) guidelines to standards in the Master Municipal Construction Document (MMCD), e.g. GI design standards and infiltration rate standardsscəẃaθən məsteyəxʷ (scəẃaθən məsteyəxʷ (Tsawwassen First Nation)) noted specific support for green infrastructure standards in the MMCD so that contractors and developers have strict, clear standards and everyone is working within the same requirements.	This feedback is incoporated in proposed actions 11.2, 11.4.
201	scəẃaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẃaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	Theme 3: Stormwater scəẃaθən məsteyəxʷ (scəẃaθən məsteyəxʷ (Tsawwassen First Nation)) requested that water quality data be included on the proposed online stormwater data dashboard. Starting with some baseline data would be helpful so that member jurisdictions have numbers they can improve on.	Metro Vancouver publishes spreadsheets with Adaptive Management Framework data that is reported by members, however, comparing water courses or watersheds can be challenging, as two creeks may be close geographically, but have different water quality and different water sources. Proposed action 11.3 lends support to this feedback, coordinating the development of a template for an online rainwater dashboard for members to report on Integrated Watershed Management Plan progress and indicators of watershed health (e.g., per cent impervious area, length of daylighted waterways, etc.). Metro Vancouver will work with members, and consider engagement feedback such as this, to determine meaningful baseline data to report.
202	scəẃaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẃaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	Theme 3: Stormwater Overall, scəẃaθən məsteyəxʷ (scəẃaθən məsteyəxʷ (Tsawwassen First Nation)) expressed support for the proposed stormwater management recommendations for the next plan.	Incorporationg this feedback, Metro Vancouver will work with its members and First Nations to implement the stormwater management actions under strategies 10, 11, and 12.
203	scəẃaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẃaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	Theme 4: scəẃaθən məsteyəxʷ (scəẃaθən məsteyəxʷ (Tsawwassen First Nation)) priorities for the next Liquid Waste Management Plan scəẃaθən məsteyəxʷ (scəẃaθən məsteyəxʷ (Tsawwassen First Nation)) noted that some of their key interests for the next Liquid Waste Management Plan (LWMP) include: - Effluent quality and its impact on the environment, both short-term and longterm - Stormwater - Overflows - Climate change scəẃaθən məsteyəxʷ (scəẃaθən məsteyəxʷ (Tsawwassen First Nation)) noted that the impacts of all of these areas affect their rights and title.	We have sought to includeproposed strategies and actions in the updated LWMP that address scəẃaθən məsteyəxʷ (scəẃaθən məsteyəxʷ (Tsawwassen First Nation)) priorities including: - Effluent quality and its impact on the environment, both short-term and longterm (see proposed Strategy 4 - Prevent and reduce pollution at the source; Strategy 13 - Treat wastewater so effluent meets or surpasses regulatory requirements; Strategy 19 - Environmental monitoring to protect public health and the environment; Strategy 20 - Collaborate on regional environmental management initiatives. - Stormwater (see proposed Strategy 10 - Manage rainwater and development for watershed health; Update and harmonize municipal tools for rainwater management; Strategy 12 - Enhance interagency collaboration to improve watershed health across the region) - Overflows (see proposed Strategy 7 - Minimize impacts of sanitary sewer overflows on human health and environment; Strategy 8- Assess combined sewer overflows' impact on receiving environment; and Strategy 9 - Separate combined sewers to eliminate CSOs) - Climate change (see proposed Strategy 1 - Provide services for a growing population in a changing climate; Strategy 2 - Improve resilience of wastewater system to climate change and natural hazards; Strategy 18 - Minimize impacts of liquid waste management on the atmosphere and air quality.)
204	scəẃaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẃaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	*Theme 5: Environmental Management* Request for Metro Vancouver's background/ambient environment monitoring data	Metro Vancouver environmental monitoring programs and results are summarized and published in the Liquid Waste Environmental Management & Quality Control Annual Reports and other Program Summary Reports. These can be accessed on Metro Vancouver's website. https://metrovancouver.org/services/liquid-waste/reports-and-resources Several proposed actions commit to sharing environmental data: see proposed actions 8.5 (changes in receiving environment due to measures taken on CSOs will be reported in the EMQC Annual Report), 11.3 (members will implement online rainwater dashboards), and 19.2 (share seasonal beach monitoring information with municipal beach operators and local Health Authorities.)

205	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	Theme 6: Climate Change scəẇaθən məsteyəxʷ (scəẇaθən məsteyəxʷ (Tsawwassen First Nation)) noted that the Province is working on a standard climate change hazard risk assessment at the provincial level, and which will be rolled out to the regional level.	Proposed action 2.2 commits MV to completion of vulnerability assessments and preparing adaptation plans for Metro Vancouver infrastructure, assets, and operations in each sewerage area to enhance resilience to future climate conditions. We will reference the Province's work to ensure alignment and identify complementary components.
206	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)Meeting: What We Heard Summary Table	scəẇaθən məsteyəxʷ (Tsawwassen First Nation)	Mar 15, 2024	*Theme 6: Climate Change* What is Metro Vancouver doing to mitigate heat risk to wastewater treatment plants, specifically theeffects of heat domes, which affect the efficiency of plant processes, more strain on power grid, and safety of staff working outdoors.	Metro Vancouver is currently in the process of completing a detailed risk assessment plan for the Annacis Island Wastewater Treatment Plant, and, based on its outcomes, will prepare plans for the remaining regional plants in the future.The following proposed actions address impacts from climate change such as heat domes: 1.1c (maintain condition and performance of the sewerage system to serve a growing population in a changing climate); 2.2 (conduct climate change and natural hazard vulnerability assessments and prepare adaptation plans for Metro Vancouver infrastructure, assets, and operations in each sewerage area to enhance resilience to future climate conditions.); 2.3 (plan, locate, design, and adapt infrastructure, assets, and operations to address identified hazards, risks, and vulnerabilities, including climate change impacts); 13.1 (plan, design, operate and maintain wastewater treatment infrastructure...to incorporate risks associated with climate change.); 14.2 (update and implement asset management plans to enhance the operational efficiency of wastewater treatment plants, maintain the reliability of the existing infrastructure and equipment for wastewater treatment plants that address risks including climate change and seismic events, and maintain performance in wet weather.)
207	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2024	*Theme 1: Biosolids* Questions about the regulations for biosolids in the province and the effectiveness of source control programs in keeping contaminants out of biosolids.	Biosolids fall under BC's *Organic Matter Recycling Regulation* (OMRR). This regulation covers treatment processes, criteria for Class A and Class B biosolids, requirements for compost and biosolids growing mediums, and limits for pathogen and metal levels. There are no regulations for CEC levels because of how new they are, however, Metro Vancouver monitors CEC levels. Metro Vancouver will continue to address CECs through source control. As new contaminants are identified, Metro Vancouver will invest in research, partner with academic institutions, and add additional monitoring as needed. The team is currently looking at a suite of different contaminants. Metro Vancouver also works with different levels of government to ban specific products or chemicals so they do not make it into wastewater. We completed a biosolids risk assessment, which looked at select CECs that are commonly found in biosolids and are representative of a large suite of chemicals believed to have human health impacts. The report is available on Metro Vancouver's website and the results suggested the presence of investigated CECs in biosolids were unlikely to result in adverse health effects for the exposed individuals - https://metrovancouver.org/services/liquid-waste/Documents/biosolids-risk-assessment-2017.pdf Proposed source control actions include 4.1 (how contaminants will be prioritized and addressed) and 4.2 (Metro Vancouver and members commitments to public education and outreach and to work with First Nations on the development of outreach). Proposed biosolids actions include 15.1 (grow the land application program and increase public outreach and education including to First Nations on how Nutrifor biosolids are used safely and responsibly as fertilizer and as an ingredient to build healthy soil.); and 15.2 (beneficial use of dried Nutrifor biosolids pellets.).
208	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2024	*Theme 1: Biosolids* Questions about beneficial uses of biosolids, especially related to agriculture.	Metro Vancouver has beneficially used 100% of the region's biosolids for the past three years in land application programs and have beneficially used 97% of our biosolids, safely and responsibly in land application, for over 30 years. Proposed action 15.1 commits Metro Vancouver to grow the land application program and increase public outreach and education, including to First Nations, on how Nutrifor biosolids are used safely and responsibly as fertilizer and as an ingredient to build healthy soil.

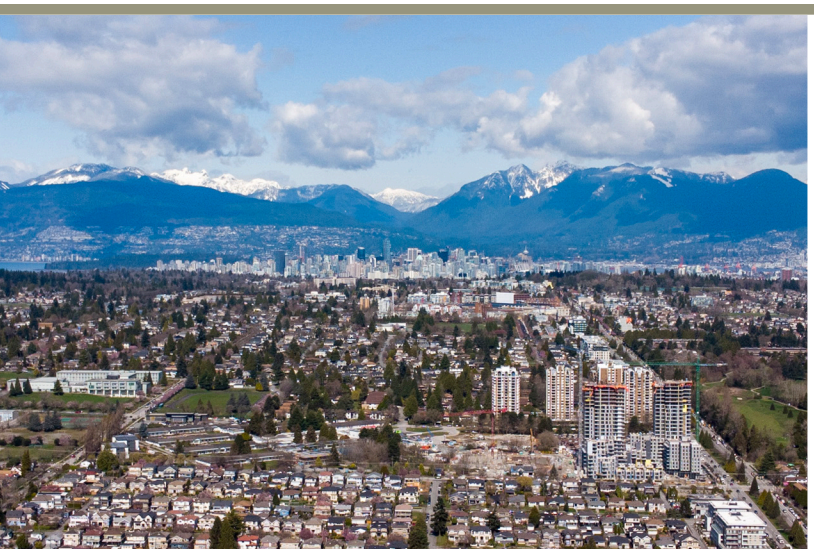
209	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2024	*Theme 1: Biosolids* Questions about monitoring of waterways in areas where Nutrifor has been applied, specifically near Burrard Inlet. səlilwətaɬ would like to look at water quality objectives and compare with the sample monitoring results.	BC's *Organic Matter Recycling Regulation* (OMRR) has specific requirements for both biosolids application and the quality of landscaping soil made with biosolids. These requirements are designed to be protective of water bodies, human health and the environment and, as such, the regulation does not require water quality monitoring following biosolids use. Even though it is not required by the OMRR or the accompanying Best Management Practices guidelines, Metro Vancouver has chosen to monitor the water quality near two sites in the Fraser Valley where a soil containing biosolids was applied (Aldergrove Regional Park and Surrey Bend Regional Park). These locations were chosen because they receive high rainfall, are in ecologically sensitive areas and neighbours use groundwater wells. The results of this water quality monitoring have not showed any evidence of biosolids-related impacts on the ground or surface water. MV has not conducted water quality monitoring on sites that have received Nutrifor Landscaping Soil in the area surrounding the Burrard Inlet. There has been research on using biosolids soils in green infrastructure to prevent contaminants in runoff from roadways and stormwater from entering waterways. This is an area that MV is interested in further exploring. Metro Vancouver would be open to working with səlilwətaɬ to complete water quality monitoring at a future Nutrifor Landscaping Soil application site or partnering to study biosolids effectiveness in preventing contaminants in road runoff from entering waterways.
210	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2024	*Theme 1: Biosolids* Question about whether MV is a leader in biosolids management or if there are other jurisdictions in the region or around the world that MV looks to.	Every region is unique in how they manage biosolids. Metro Vancouver is connected with other biosolids industry groups such as Northwest Biosolids, which is a biosolids association. Metro Vancouver is aware of what other regions are doing and hearing about what is going well and opportunities to learn from each other. In some areas, Metro Vancouver is leading but what is more important is being well connected to the industry. An example of where Metro Vancouver is leading is our work on hydrothermal processing of wastewater sludge into a low carbon fuel, which is innovative for the industry. We are also leading in monitoring for CECs and participating in research. For example, see proposed action 15.2 that commits Metro Vancouver to building a regional biosolids dryer to produce granular pellets that can be used as a low carbon fuel and as a fertilizer product; and 15.3, committing Metro Vancouver to exploring technologies that displace production of Nutrifor biosolids.
211	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2024	*Theme 2: Resource Recovery* Suggestion that MV show the amount of less sustainable fuels that are being displaced because of resource recovery as a metric.	Metro Vancouver agrees that telling the story of how the energy generated displaces an equivalent amount of fossil fuels could be beneficial for public education. This feedback is incorporated into Strategy 16, Implement Proven Resource Recovery Technologies, the proposed performance indicator 16A is: Amount of energy recovered from liquid waste system (gigajoules). This intends to be the sum of energy from all energy types (e.g., biogas, sewer heat, biocrude), recovered by Metro Vancouver or members, for use by any end customer.
212	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2024	*Theme 2: Resource Recovery* Request for greywater resources.	Metro Vancouver has published a Non-Potable Water Systems Guidebook (https://metrovancouver.org/services/water/Documents/non-potable-water-systems-guidebook-2022.pdf) to support greywater use in the region, along with a Companion Document (https://metrovancouver.org/services/water/Documents/non-potable-water-systems-companion_document.pdf) to provide further guidance to those involved in the non-potable water field, as well as background information for general readers. Greywater systems (also referred to as 'non-potable water systems') are not in scope for the LWMP so there are no actions associated with these systems in the LWMP. However, Metro Vancouver's Water Services department has explored this issue and included an action in the 2011 Drinking Water Management Plan (DWMP) to evaluate alternatives to potable water for specific purposes. The DWMP is currently being updated and more information about this process is available here: https://metrovancouver.org/services/water/drinking-water-management-plan
213	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2024	*Theme 2: Resource Recovery* Suggestion that MV connect with the səlilwətaɬ school to see if they would be interested in site tours or internships to learn about resource recovery and other wastewater innovations.	Metro Vancouver has a number of school and youth leadership programs that provide opportunities for teachers and youth to explore how Metro Vancouver is working to create a sustainable region by engaging meaningfully with local priority issues through place-based experiential learning. Metro Vancouver would be pleased to connect with educators from səlilwətaɬ to discuss engagement opportunities. To this end, the LWMP also includes a proposed action 17.1 for Metro Vancouver to research, develop, and pilot new methods to expand the recovery and use of energy, nutrients, water and other emerging resources from the liquid waste system, by conducting public outreach and education about resource recovery, including to First Nations.
214	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2024	*Theme 2: Resource Recovery* Suggestion that səlilwətaɬ could get involved in MV research and pilot projects by having səlilwətaɬ partner companies included in MV's procurement process.	Proposed action 17.1 incorporates this feedback by committing Metro Vancouver to research, develop. and pilot new methods to expand the recovery and use of energy, nutrients, water and other emerging resources from the liquid waste system by collaborating with First Nations on pilot projects.

215	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2024	*Theme 3: Growth* Recommendations should acknowledge the importance for growth planning to align with First Nations plans and priorities. Question about if there is a direct connection between MV and səlilwətaɬ land planning team. Staff from the public works and land planning teams may be interested in commenting on growth recommendations.	Metro Vancouver agrees that it is important to understand First Nations plans related to growth planning. Usually, member jurisdictions will reach out directly to impacted First Nations for input on plans before presenting them to Metro Vancouver. Action 1.3, the development of Master Sewer Servicing Plans, will include engagement with First Nations which should help to align sewer servicing plans for growth with First Nations plans and priorities, however, regional planning coordination with First Nations is out of scope for the LWMP and will be best addressed through discussions with Metro Vancouver's regional planning department. Metro Vancouver would be interested in hearing from the səlilwətaɬ land planning team. We would also be pleased to coordinate meetings with səlilwətaɬ and member jurisdictions to discuss planning for the future. Please let us know when might be a good time to discuss this topic.
216	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2024	*Theme 3: Growth* Question about what MSSPs (Master Sewer Servicing Plans) include.	A Master Sewer Servicing Plan (MSSP) is another level of detail compared to the LWMP. It typically identifies service gaps in the sewer system and determines the timing and location of capital improvement projects to meet anticipated demands, as well as, maintain and operate the utility over the 20-yr, 50-yr or longer term of the plan. Proposed action 1.3 commits Metro Vancouver and members to creating and updating MSSPs and ensuring that First Nations are engaged appropriately.
217	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Apr 17, 2024	*Theme 4: Meeting format and materials* The meeting format worked well. Continue sending meeting materials in advance as this allows səlilwətaɬ to consider the information and come prepared with questions. Virtual meetings work well but also happy to meet in person.	Metro Vancouver will continue to provide the meeting materials in advance. Metro Vancouver will ask if səlilwətaɬ prefers to meet in-person or virtually before each meeting.
218	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 15, 2024	*Theme: Coordination* Stormwater is very important to səlilwətaɬ. With the LWMP update, there is an opportunity for MV to do better with coordination at a regional scale to handle all the different aspects of stormwater. This includes with members and with other organizations like the Port Authority.	Improved coordination for stormwater management is one of the key focuses for the next LWMP. Some examples of actions, new and continuing from the last plan to address this include: • Members will work with First Nations to prioritize watersheds for Integrated Watershed Management Plan (currently known as Integrated Stormwater Management Plan) development, monitoring, and review, by considering both watershed health and cultural significance. • Members will update rainwater policies, programs, and bylaws in a harmonized manner • Metro Vancouver will coordinate the development of a template for an online rainwater dashboard for members to report on IWMP progress and indicators of watershed health. • Metro Vancouver will coordinate, with members, an approach for seeking to update the Master Municipal Construction Documents (MMCDs) such that green infrastructure guidelines become standards. • Metro Vancouver will coordinate a revision of the interagency group's terms of reference, to operate as a sub-committee under the Regional Engineer's Advisory Committee (REAC), to lead local research on rainwater management, to be the primary regional advocate with regulators, and to coordinate region-wide accountability on IWMP actions.SILG will host a biennial "State of Regional Stormwater Management" forum to foster collaboration and knowledge-sharing among First Nations and watershed interest groups. • Members and Metro Vancouver, as the interagency group, will host a forum at regular intervals to report progress on IWMPs and LWMP rainwater actions, and to foster collaboration and knowledge sharing among members, First Nations and watershed stakeholders. The Port Authority is a member of the Environmental Monitoring Committee where water quality issues are reviewed. This feedback is incorporated and/or addressed in proposed actions 10.1, 10.2b, 11.2, 11.3, 11.4, 12.1, 12.4 for the above examples and strategies 10, 11, 12 for the other stormwater actions.

219	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 15, 2024	*Theme: Actionable and Measurable LWMP* In order for the LWMP to be effective, it must be actionable and measurable. səlilwətaɬ staff have observed new developments without stormwater management infrastructure and regulatory barriers to green infrastructure at the municipal level. This means that the actions in the previous LWMP aren't being implemented properly. This plan needs to have actions that can be clearly implemented.	In the case of stormwater management, creating actionable and measurable LWMP strategies and actions includes some of the following:• Setting timeframes for actions to be completed (all actions that can be timebased)• Continuing to improve metrics and have key performance indicators• Creating dashboards to report on progress, including development of a template for an online rainwater dashboard for members to report on IWMP progress and indicators of watershed health (proposed action 11.3)• Assigning actions to members (all actions)• Establishing dedicated municipal funding to ensure consistent and reliable service delivery for rainwater management (proposed action 11.1)•Improved forums for progress checks and discussions on LWMP actions
220	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 15, 2024	*Theme: Monitoring and measurability* Stormwater quality monitoring is limited. How is measurability being incorporated—how will the region reach measurable water quality improvement?	One of the conditions of the BC Minister of Environment and Climate Change Strategy's approval of the 2011 Integrated Liquid Waste Resource Management Plan required that municipalities, with the coordination of Metro Vancouver, develop a monitoring and adaptive management framework for assessing watershed health and the effectiveness of ISMPs. To meet this requirement, Metro Vancouver formed a technical working group composed of members of the regional Stormwater Interagency Liaison Group, the regional Environmental Monitoring Committee, as well as the BC Ministry of Environment. The group produced a Stormwater Monitoring and Adaptive Management Framework (AMF) for monitoring stormwater, assessing the effectiveness of ISMPs, and recommending adaptive management practices. Metro Vancouver and its members use the AMF to monitor watershed health and the effectiveness of ISMPS. The AMF uses a multiple lines of evidence approach which includes chemical, bacteriological, hydrological and benthic invertebrate monitoring. There are measurement regimes recommended for each type of stream or piped system, as well as evaluation criteria and guidance on adaptive management practices. Since the AMF was developed in 2014, most municipalities are on their second round of analysis so follow-up actions in their ISMPs have been limited. As more data and analysis occurs, more understanding of the correct mitigations will advance. Proposed actions that incoporate and/or support this feedback: 10.1, 10.2, 11.3, 12.1
221	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 15, 2024	*Theme: Collaborating with səlilwətaɬ on Stormwater* When asked "How would səlilwətaɬ like to collaborate on IWMP development, monitoring, and review?" səlilwətaɬ responded with this feedback: səlilwətaɬ has limited capacity. Metro Vancouver and members must consider when it would be most strategic and worthwhile within the IWMP process for səlilwətaɬ to provide feedback. səlilwətaɬ finds that they are often saying the same things at different tables, sometimes with limited implementation of feedback. It would be ideal for səlilwətaɬ to provide their high level input on watersheds, stormwater management, and water quality at key, strategic points during the process, at one table. səlilwətaɬ does not have the capacity to meet with multiple jurisdictions on the same topic over and over, when there are often common themes that would be shared. Suggested that providing feedback on strategic plans, such as the LWMP, is a starting place for the provision of this strategic, higher level feedback. It was also noted that səlilwətaɬ has not seen many IWMP-related (currently referred to as ISMP) referrals coming to səlilwətaɬ for input.	This feedback is incorporated into proposed Strategy 12 (coordinating with First Nations to work with First Nations in a manner that is most timely and strategic for First Nations) and 12.4 (a regular forum on rainwater management progress with members, First Nations, and others) as well as proposed action 10.1 a) which provides the opportunity for First Nations to take part in the update of the Integrated Watershed Management Plan template. In addition, members will work with First Nations to prioritize watersheds for IWMP implementation and to develop and review IWMPs (proposed action 10.2)

222	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 15, 2024	*Theme: Monitoring and measurability* When asked about the draft actions under Strategy #2: Enhance collaboration by revitalizing the Stormwater Interagency Liaison Group səlilwətaɬ provided this response: The actions under this strategy lack measurability. They are about knowledge-sharing and exploration, which are important, but for them to be effective, the actions should be tied to measurable actions and improvements. All actions should be linked to targets for measurable improvements in water quality.	The Interagency Group will be responsible for coordinating the implementation of the rainwater management actions within the LWMP. While it is difficult to measure the success of a coordination group, performance indicators can measure specific actions within the LWMP. Proposed action 11.3 will develop a template for a rainwater management dashboard to track and report on the progress of Integrated Watershed Management Plans across the region. Performance indicators under Strategies 10 and 11 will also lend support to this feedback.
223	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 15, 2024	*Theme: Collaborating with səlilwətaɬ on Stormwater*In response to this draft action: “In collaboration with First Nations, members will prioritize watersheds for IWMP development, considering both watershed health and cultural significance. First Nations will be invited to participate in IWMP development, monitoring, and review” səlilwətaɬ had the following feedback:səlilwətaɬ would like to see stronger language in the LWMP actions than “collaboration” and “invited to participate”. Would like to see language such as “ensure Indigenous rights are protected”, “consent” language, and language that reflect the principles of the *United Nations Declaration on the Rights of Indigenous Peoples*.	Wording within the LWMP has been revised based on this feedback, including proposed strategies 10, 11, and 12. We will continue to work to use language that reflects Metro Vancouver's commitment to meaningful engagement, dialogue, and collaboration with First Nations on our plans, programs and projects, as outlined in Metro Vancouver’s Board Strategic Plan, 2022-2026.
224	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 15, 2024	*Theme: Collaborating with səlilwətaɬ on Stormwater* səlilwətaɬ would like to provide feedback on the IWMP template to ensure that səlilwətaɬ priorities and requirements are embedded into the templates. There needs to be more accountability for members to uphold Indigenous rights.	This feedback has been incorporated into proposed action 10.1 (First Nations to provide input on the Integrated Watershed Management Plan template).
225	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 15, 2024	*LWMP Strategy #3: Update and harmonize municipal tools* Support expressed for the draft actions under Strategy 3#: Update and harmonize municipal tools (referenced above under the theme Monitoring and Measurability). Support was expressed as these actions are the most actionable and measurable, leading to clear outcomes for water quality. Specific support expressed for dedicated funding for stormwater.	This feedback is being advanced through the proposed actions under Strategy 11.
226	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	May 15, 2024	Request for Metro Vancouver to share https://səlilwətaɬ (Tsleil-Waututh Nation)ation.ca/stormwater/ as part of it’s LWMP public engagement outreach.	Metro Vancouver shared the link to this webpage within its Phase 2 public engagement survey (which was promoted and available to the public from June 13 to July 15 2024), as part of the stormwater section, and will continue to look for ways to share this content.

227	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Jun 19 2024	Integrating Burrard Inlet Water Quality Objectives A desire to understand exactly how the updated Burrard Inlet Water Quality Objectives (BIWQOs) are and will be used by Metro Vancouver.	All of Metro Vancouver's Receiving Environment Monitoring Programs (REM) for Burrard Inlet include an evaluation of attainment of BIWQOs. If a particular program has been in place for a number of years, periodic program reviews include temporal evaluation of attainment of the objectives in the context of discharges from the Metro Vancouver liquid waste management system. If a statistically significant increasing concentration trend is observed, Metro Vancouver looks at actions that may be implemented to address it, which include modifications of wastewater treatment plant processes or appropriate source control actions. Metro Vancouver REM programs are designed to evaluate attainment of the water quality objectives, and will continue to do so with the updated BIWQOs developed by the Province and səlilwətaɬ. We will aim to add a description to the LWMP of səlilwətaɬ's work on the BIWQOs and how Metro Vancouver is using the objectives. We would like to work with səlilwətaɬ on to develop this content (whether it is added as a 'call-out box' or in some other form).
228	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Jun 19 2024	Environmental Monitoring and Data Collection Metro Vancouver collects a high volume of important water quality data that would be useful to others if shared in a more approachable way. The breadth of data was very useful in developing the updated BIWQOs.	Metro Vancouver and members acknowledge that they generate a high volume of data. Wastewater treatment plant influent and effluent data and receiving environment monitoring reports can be found at: https://metrovancouver.org/services/liquid-waste/reports-and-resources. In addition, this web page contains links to Environmental Management and Quality Control (EMQC) Annual Reports for the last five years. Metro Vancouver and members will be reporting on LWMP Performance Indicators, Appendix B, via an 'LWMP Dashboard' (see 'Monitoring and Reporting' section). Several proposed actions commit to sharing data publicly: see proposed actions 6.2 (members will publicly report I&I dashboard data), 8.5 (changes in receiving environment due to measures taken on CSOs will be reported in the EMQC Annual Report), 11.3 (members will implement online rainwater dashboards), 13.1-13.4 (Performance Indicator: influent and effluent quantity and characteristics will continue to be reported in the EMQC Annual Report), and 19.2 (share seasonal beach monitoring information with municipal beach operators and local Health Authorities).
229	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Jun 19 2024	Working CollaborativelyHow can we advance the work that everyone is doing to improve water quality in the Burrard Inlet? How can we better use the BIWQOs, and the related body of research, and make it more coordinated across jurisdictions to produce better, faster results, ultimately resulting in a return to shellfish harvesting in Burrard Inlet?	Metro Vancouver has been an active and engaged participant in the process of the development of the updated BIWQOs. We are willing to participate in any future efforts related to the augmentation of the scientific knowledge – and specifically related to the interaction of the regional liquid waste utility system – with the receiving environment of Burrard Inlet.To this end, proposed actions 8.6, 8.7, 8.8 aim to mitigate the impacts of CSOs on the receiving environment by implementing system optimization or mitigation measures that reduce sanitary sewage in overflows. Additionally, the LWMP includes actions 20.1 (Metro Vancouver will participate in relevant collaborative environmental program(s) for regional water bodies (i.e., Fraser River, Burrard Inlet, Strait of Georgia) along with other interested parties, including members, First Nations, senior government and stakeholders) and 20.2 (Metro Vancouver will continue to participate, and members may participate, in the Ministry's processes to review and establish water uses and water quality objectives for specific water bodies within Metro Vancouver.)
230	səlilwətaɬ (Tsleil-Waututh Nation) Monthly LWMP Meeting: What We Heard Summary Table	səlilwətaɬ (Tsleil-Waututh Nation)	Jun 19 2024	Working Collaboratively səlilwətaɬ is in conversation with the Province and other municipalities. MV is in conversation with its member municipalities. It would be good for MV and səlilwətaɬ to work together to address gaps and opportunities across jurisdictions, to improve water quality in the region.	Metro Vancouver would be glad to further our collaboration with səlilwətaɬ and other jurisdictions and look at future opportunities to work together on the improvement of environmental quality in Burrard Inlet. In the LWMP, this is reflected in proposed actions: 12.1 (update the rainwater management and watershed health interagency group terms of reference to include the coordination of when it would be most strategic, efficient and worthwhile within IWMP processes for First Nations to provide feedback to multiple members and Metro Vancouver, and verify the implementation of feedback), 20.1 (Metro Vancouver will participate in relevant collaborative environmental program(s) for regional water bodies (i.e., Fraser River, Burrard Inlet, Strait of Georgia) along with other interested parties, including members, First Nations, senior government and stakeholders), 20.2 (Metro Vancouver will continue to participate, and members may participate, in the Ministry's processes to review and establish water uses and water quality objectives for specific water bodies within Metro Vancouver.)



From Source to System to Sea

Public Advisory Committee Recommendations for Metro Vancouver's Liquid Waste Management Plan

Indigenous Territorial Acknowledgement

Metro Vancouver acknowledges that the region's residents live, work, and learn on the shared territories of many Indigenous peoples, including 10 local First Nations: q̓i̓c̓əy̓ (Katzie), q̓ʷɑ:ƛ̓əƛ̓əm (Kwantlen), kʷikʷəƛ̓əm (Kwikwetlem), máthxwi (Matsqui), xʷməθkʷəy̓əm (Musqueam), qiqéyt (Qayqayt), Semiahmoo, Sḵwx̱wú7mesh Úxwumixw (Squamish), scəẃaθən məsteyəxʷ (Tsawwassen) and səlilwətaɬ (Tsleil-Waututh).

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

About Metro Vancouver

Metro Vancouver is a diverse organization that plans for and delivers regional utility services, including water, sewers and wastewater treatment, and solid waste management. It also regulates air quality, plans for urban growth, manages a regional parks system, provides affordable housing, and serves as a regional federation. The organization is a federation of 21 municipalities, one electoral area, and one treaty First Nation located in the region of the same name. The organization is governed by a Board of Directors of elected officials from each member jurisdiction.

Front cover: (clockwise from top left) Looking north from 59th Avenue and Cambie Street; Iona Island Wastewater Treatment Plant; Pacific Spirit Regional Park.

4515 Central Boulevard, Burnaby, BC, V5H 0C6
metrovancouver.org
November 2024

Introduction

Metro Vancouver is located where the mighty Fraser River meets the Salish Sea. The river and its lower watersheds, with hundreds of creeks and streams, are now home to more than three million people, but are still alive with salmon and many other species.

The Liquid Waste Management Plan Public Advisory Committee ("the Committee") acknowledges the important role First Nations play in stewarding the region for millennia according to laws and customs that have historically ensured abundance, rich biodiversity, and sustainable economies, and further notes the necessary work of reconciliation and ensuring that First Nations title and Rights and inherent authority in their territories is recognized in land and water management in the Metro Vancouver region.

Clean, abundant water is vital for all of us in this region. Fish and wildlife are also highly dependent on the health of our local streams and rivers and coastal waters. We have a shared responsibility as a community to manage our impacts on this irreplaceable resource and source of life.

Guiding principles for these recommendations:

- Emphasize source control and pollution prevention
- Employ a holistic, watershed-based approach
- Ensure Specific, Measurable, Achievable, Relevant and Time-bound (SMART) metrics, leading to the improvement of water quality

The Liquid Waste Management Plan Public Advisory Committee

The Committee was convened in fall 2021 to advise Metro Vancouver on the review and update of the existing regional Liquid Waste Management Plan (LWMP, 2011). The Plan is required to meet the responsibilities of Metro Vancouver and its members under the BC Environmental Management Act. The updated Plan will set the course for how the region will manage wastewater and stormwater for the next 10 years and includes actions for Metro Vancouver and its members.

The Committee is made up of nine community members who bring a variety of perspectives to wastewater and stormwater issues, including technical and legal experts, wastewater management specialists, environmentalists, and business representatives. The Committee was formed to receive information, ask questions, provide recommendations, and engage in discussion concerning regional wastewater and stormwater management issues.

Deborah Carlson, Co-Chair
Staff Lawyer, West Coast Environmental Law

Dr. Peter Ross, Co-Chair
Senior Scientist & Director, Water Pollution, Raincoast Conservation Foundation

Matt Brown
Director, Western Watersheds, Swim Drink Fish Canada

Dr. Stephanie Chang
Professor, School of Community and Regional Planning, and Institute for Resources, Environment, and Sustainability, UBC

Russell Elliot
Campaigns Manager, Georgia Strait Alliance

Deborah Jones
Rain Gardens Coordinator, Cougar Creek Streamkeepers

Jacek Redlinski
Zone Director, Lower Mainland, Building Officials Association of BC

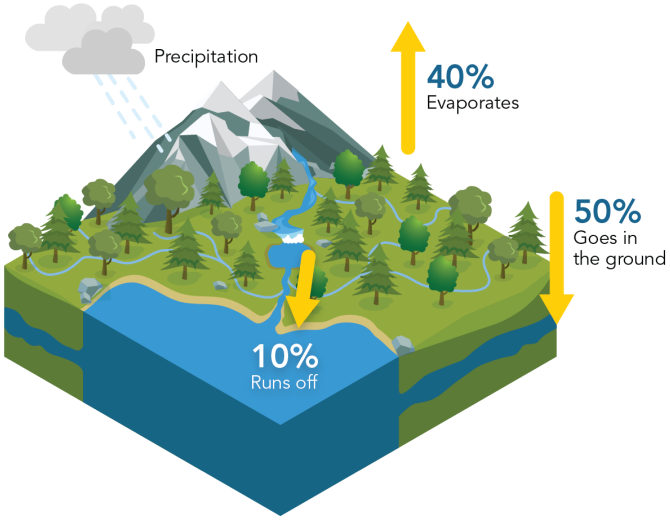
Dr. Chi Ho Sham
Independent Consultant; Former President, American Water Works Association

Graham With
Head Brewer, Parallel 49 Brewing Company

We'd also like to acknowledge the contributions of former Committee members Lucero Gonzalez Ruiz, formerly of Georgia Strait Alliance, and Lauren Brown Horner, formerly of Swim Drink Fish.

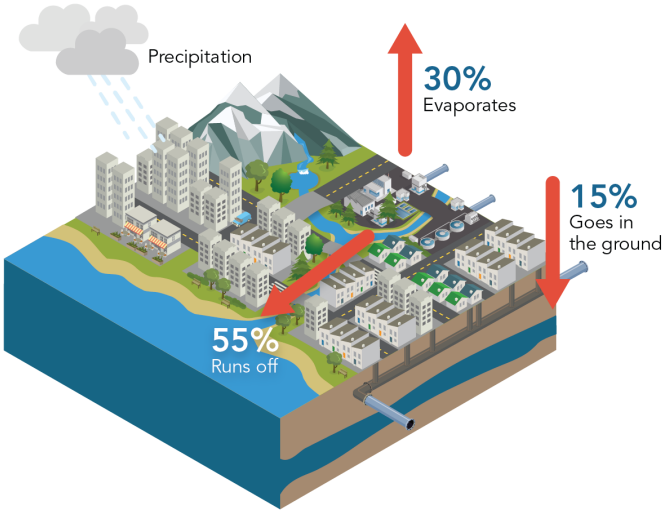
Guided by the journey of wastewater and stormwater in Metro Vancouver watersheds, from **source to system to sea**, the Committee worked over the past three years and generated a list of more than 50 recommendations, which have been refined into the following thirteen priority recommendations for the next Liquid Waste Management Plan.

The water cycle in a natural area



In nature, trees and earth help absorb rain slowly, breaking down pollutants, refilling groundwater aquifers, reducing flooding, and keeping waterways healthy.

The water cycle in an urban area



In urban areas, rainwater travels along paved surfaces to storm sewers rather than sinking into the ground. This means it bypasses groundwater aquifers, creates surges in waterflow that can cause flooding and alter stream channels, and picks up pollutants along the way which are harmful to plants, wildlife, and animals.

*Urban water cycle for areas with 75 – 100% impervious surface, from "Impervious Surface Coverage: The Emergence of a Key Environmental Indicator" Arnold and Gibbons, 1996.

Public Advisory Committee Recommendations for the LWMP:

To encourage everyone to take action to **improve the quality** and **reduce the quantity** of wastewater and stormwater at their sources:

RECOMMENDATION	
1	Engage and educate all producers of wastewater (residents, business, industry, institutions, governments) to recognize the impact their actions have on the health of local waters and their role in reducing the pollutants entering our wastewater, and the overall quantity of water entering the wastewater management system.
2	Encourage water conservation to reduce the need for moving larger volumes of wastewater, the demand for additional wastewater treatment capacity, the cost of wastewater management, and greenhouse gas (GHG) emissions associated with the pumping and treatment of wastewater.
3	Investigate and identify best practices to intercept pollutants in stormwater (urban run-off) before they reach streams and waterways, and support restoration initiatives and studies across the region with a focus on fish-bearing streams.
4	Create a list (e.g., "Top Ten") of priority pollutants in stormwater and wastewater, and monitor progress to reduce them across Metro Vancouver.
5	Cooperate with researchers to advance understanding of impacts on aquatic species and ecosystems from stormwater and wastewater pollution, and develop effective prevention measures.
6	Engage all levels of government to identify, regulate, enforce, and incentivize the reduction or elimination of pollutants at the source.

Result: This will make our local waters healthier and reduce the cost to treat wastewater and manage stormwater for the region's taxpayers.

To **improve the performance** of region's wastewater and stormwater systems through **more holistic, strategic and transparent approaches**:

RECOMMENDATION	
7	Continue to increase the implementation of green infrastructure across the region, in alignment with the Climate 2050 Roadmap for Nature and Ecosystems, and the Regional Green Infrastructure Network: Invest in the maintenance of green infrastructure and monitor and assess its outcomes for stormwater management in a changing climate, to constantly improve its success.
8	Monitor the implementation of Integrated Watershed Management Plan (formerly known as Integrated Stormwater Management Plans) objectives in land use practices across Metro Vancouver members. In particular, require Metro Vancouver members to monitor and report changes within each Integrated Watershed Management Plan area in: a. Effective impervious area, permeable surface, or effective permeable surface b. Tree canopy cover (riparian and non-riparian) c. Conditions for indigenous fish populations
9	Work to remove regulatory barriers (such as in the BC Building Code) to encourage the use of green infrastructure rather than restrict it. Green infrastructure and associated stormwater management practices that require regulatory update include: • Disconnection of roof downspouts from storm sewers • Authorization of stormwater diversion from one property to another, in safe circumstances (for example, school parking lot to municipal boulevard; municipal street to hospital landscaping; residential building roofs to adjacent parkland) • Increased protection of tree canopy • More use of bioswales, enhanced ditches (i.e., informally landscaped), green roofs, rain gardens
10	Invest in green infrastructure, in conjunction with appropriate grey infrastructure, as a response to climate and land use changes, and prioritize improvements in problematic stormwater catchment areas that convey the highest amount of pollutants to the most vulnerable receiving waters.
11	Create a regional map and dashboard that provide information and data on: • The types of pollutants that enter the systems and their sources (e.g. industry, homes, businesses) • Integrated Watershed Management Plan (IWMP) trends, indicators, measures for success, and outcomes • IWMP implementation • The sewage and stormwater systems, showing where wastewater enters and exits the system • All green infrastructure installations in the region • The progress of sewer separation • The annual number and volume of combined and sanitary sewer overflows • Environmental and ecological information • First Nations cultural sites and activities *An IWMP provides direction for future development plans and identifies infrastructure needs while better understanding the impacts of development on the environment. The goal is to balance land use planning, stormwater engineering, flood and erosion protection, and environmental protection.

Result: This will help protect the health of the region's rivers, streams, and coastal waters, and make wastewater and stormwater systems more effective and efficient.

To strengthen our knowledge and understanding of **local water quality** and **emerging and traditional pollutants:**

RECOMMENDATION	
12	Encourage the gathering of high-quality data and knowledge among First Nations, environmental and academic organizations, Metro Vancouver, member jurisdictions, and senior levels of government. Create a data clearing house to coordinate monitoring, data standards, data objectives, data quality, analytics, and study framework.
13	Facilitate a network to share and analyze data across the region.

Result: This will advance the region's ability to act strategically and effectively to protect local waterways.

Guidance for Implementing the Recommendations

Implementing these recommendations will require:

- Close collaboration among Metro Vancouver members and with provincial and federal agencies, and First Nations
- Tapping into complementary funding sources such as those allocated for salmon conservation, climate resilience and adaptation, and biodiversity protection
- Careful prioritization and optimization of recommended activities based on data analysis

Iona Beach Regional Park

Conclusion

As community members who bring interests, experience, and technical expertise in the areas of wastewater and stormwater issues, we appreciate the opportunity to offer our advice and guidance to the update of the Liquid Waste Management Plan.

The previous Plan laid the foundation for this update and it is critical that we continue to work collaboratively to adapt and prepare for the future in a period of rapid change.

By taking an integrated grey and green infrastructure approach to designing and managing the system, we will safeguard our communities and our ecosystems effectively and affordably.


metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

Liquid Waste Management Plan Update

Phase 2 Public Engagement Summary

2023 IMPAC5 Ocean Festival, Jack Poole Plaza, Vancouver

Acknowledgements

Thank you to everyone who provided input on the second phase of public engagement for the region's Liquid Waste Management Plan update. Metro Vancouver embraces collaboration and innovation to provide sustainable regional services that contribute to a livable and resilient region and a healthy natural environment for current and future generations. The purpose of this phase of engagement was to gather input on the focus areas within the scope of the plan update. This input was used to develop draft goals, strategies, and actions for Metro Vancouver and its members to continue to improve wastewater management in the region. We appreciate your time, and the insights and comments you shared with us during the second phase.

About Metro Vancouver

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metrovancouver.org

September 2024

Contents

About the Liquid Waste Management Plan

Every day, the millions of homes, businesses, and industries across the region create more than one billion litres of wastewater, which contains bacteria and contaminants that can be harmful to human health and the environment. Thousands of kilometres of underground sewer pipes carry this wastewater to Metro Vancouver's five wastewater treatment plants. There, it is treated and tested before being released into the region's rivers and ocean — home to a delicate and precious ecosystem of plants and animals that are increasingly threatened by the impacts of climate change, urban development, and human activity.

Everyone has a role to play when it comes to the health of our local waters. Part of Metro Vancouver's role is updating the **Liquid Waste Management Plan**. This long-term, regional plan is approved by the Province and allows Metro Vancouver and member jurisdictions to set out community-specific goals, strategies, and actions for wastewater management that help ensure the protection of human health and the environment, while using wastewater as a resource and minimizing costs. Liquid waste management plans are typically updated about every 10 years to reflect the emerging needs of the region — to address climate change, new contaminants of concern, changing societal and environmental needs, and reflect new science and technology.


White Rock

Executive Summary

Phase 1 – 2021
Vision and Guiding Principles

Phase 2 – 2022 – 2024
Goals, Strategies, Actions, and Draft Plan

Phase 3 – 2025
Plan Approvals

Engagement on the review and update of the Liquid Waste Management Plan started in 2021. In the first phase, Metro Vancouver reviewed the **current Liquid Waste Management Plan (2011)** and identified successes, opportunities for improvement, and gaps. Metro Vancouver engaged with the public and other interested parties, as well as member jurisdictions, to develop a draft vision and concepts for guiding principles for the updated plan. Metro Vancouver also engaged with First Nations to hear their input on the draft vision and guiding principles. The **Phase 1 Engagement Summary** includes details about what we heard from the public in the first phase.

In the second phase of engagement, Metro Vancouver has been working closely with member jurisdictions, First Nations, and the Liquid Waste Management Plan Public Advisory Committee to develop draft goals, strategies, and actions in the following focus areas that fall under regional and municipal jurisdiction:

- System resilience
- Source control
- Sanitary and combined sewer overflows
- Rainwater management
- Wastewater treatment
- Biosolids
- Circular water economy (resource recovery)
- Environmental management

To get input from the public on potential actions in these focus areas, Metro Vancouver held an online survey (400 respondents), a webinar (33 attendees) and attended the Water and Environment Student Talks Conference at the University of British Columbia (talked to 33 attendees) and the Concord Pacific Dragon Boat Festival (talked to 304 attendees).

Key themes noted through the second phase of engagement included:

- **Population Growth and Urban Density** – concerns about the regional and municipal wastewater systems' capacity to service increasing population growth and urban density in the region
- **Delivery of Major Projects** – concerns about cost increases on wastewater treatment plant upgrades, project oversight, and Metro Vancouver governance
- **Climate Change** – particularly focused on the need for the region's wastewater systems to be resilient to climate change and extreme weather
- **Stormwater Management** – support for increased use of green infrastructure and concerns about the effects of the pollutants in stormwater on marine life
- **Wastewater Treatment** – including both support (to further protect the environment) and opposition (to decrease costs) for increased levels of treatment
- **Combined Sewer Separation** – support for the acceleration of separating storm and sanitary sewers in combined sewer areas of Vancouver, New Westminster, and Burnaby
- **Affordability** – support for changes to Metro Vancouver's cost allocation for large projects, spreading costs across the region, support for investing in wastewater system upgrades now as costs will only increase, and for delivering wastewater management services in an economically sustainable way, now and in the future
- **Water Conservation** – support for increased water conservation measures, including water metering to reduce water use at the source

First Nations Engagement

Metro Vancouver is situated within the territories of many Indigenous Nations, including 10 local First Nations: q̓i c̓əy̓ (Katzie), q̓ʷɑ:ƛ̓ən (Kwantlen), kʷikʷəƛ̓əm (Kwikwetlem), máthxwi (Matsqui), xʷməθkʷəy̓əm (Musqueam), qiqéyt (Qayqayt), Semiahmoo, Sḵwx̱wú7mesh Úxwumixw (Squamish), scəẃaθən məsteyəxʷ (Tsawwassen), and səlilwətaɬ (Tsleil-Waututh).

This is important to note because any kind of long range plan that affects the region, such as the Liquid Waste Management Plan, will also affect these First Nations and their communities.

Throughout the second phase of engagement, Metro Vancouver has engaged with First Nations in a separate, government-to-government process, which included customized engagement approaches through ongoing one-on-one meetings. In addition, three technical workshops were held which brought First Nations, member jurisdictions, representatives from the BC government, and the Liquid Waste Management Plan Public Advisory Committee together to hear from one another and to share their input and perspectives on the updated plan.

We will continue to collaborate with First Nations as the update progresses so that their perspectives, priorities, and desired outcomes are well-represented in this plan.

Public Advisory Committee

A public advisory committee was formed in the first phase of engagement to provide expert knowledge and relevant experience on the plan update. It includes nine members from academia, environmental organizations, business, and technical experts. Throughout 12 meetings held across the first and second phases of engagement, the public advisory committee worked through the focus areas for the updated plan and developed a set of 13 recommendations to be presented to the Liquid Waste Committee in fall 2024 to inform the Liquid Waste Committee's decisions on the updated plan.

Sapperton Pump Station

What We Did and Who Participated

Engagement

The review and update of Metro Vancouver's Liquid Waste Management Plan includes technical analysis and policy development, along with engagement. Engagement is taking place over three phases and each phase includes engagement with First Nations, member jurisdictions, the public, and others.

Phase 1 Review and Consider	Phase 2 Draft Goals, Strategies, Actions, and Draft Plan	Phase 3: Engage on Final Draft Plan and Seek Approvals
In this phase, we reviewed the current plan and identified successes, opportunities for improvement, and gaps. Input informed the development of a draft vision and concepts for guiding principles.	In this phase, we sought input on focus areas within the scope of the Liquid Waste Management Plan, and used input to develop draft goals, strategies, and actions. A draft plan based on this phase of engagement was developed for Liquid Waste Committee feedback and direction.	In the last phase, we will finalize the draft plan based on the direction from the Liquid Waste Committee. We will share the final draft plan with First Nations, member jurisdictions, and the public for review and input. Final input will be considered, and where possible, incorporated into the updated plan. We will then submit the final draft plan to member jurisdictions for approval, before submitting it to the Province for its consideration. The Province will then either approve the plan, approve it with ministerial conditions, or return the plan for additional revisions before it can be approved.

The first phase of public engagement took place in fall 2021 and informed a draft vision and concepts for guiding principles. During the second phase of public engagement, from June 13 to July 15, 2024, staff gathered input on key areas of focus for the next plan to address (system resilience, source control, sanitary and combined sewer overflows, rainwater management, wastewater treatment, biosolids, circular water economy, and environmental management). Engagement opportunities included an online survey, two public events, a webinar, and email correspondence. This engagement summary provides an overview of what staff did and heard during the second phase.

Public Events

Staff attended the Fifth International Marine Protected Areas Congress (IMPAC5) Ocean Festival on February 3 and 4, 2023 and spoke to more than 200 attendees about the region's wastewater system and the work to update the Liquid Waste Management Plan. In 2024, staff attended the Water and Environment Student Talks (WEST) Conference at UBC on June 13, attended by students and faculty in the water and wastewater management field, and the Pacific Concord Dragon Boat Festival on June 22. Participants were invited to learn about the Liquid Waste Management Plan update as well as actions they could take in their homes and businesses to protect local waters. They were encouraged to take the online survey to further share their input on the plan update, and to attend the webinar. Across these two events in 2024, staff engaged with more than 330 participants. Opportunities for engagement included input from a focused audience (WEST Conference), and the general public (online survey), as well as events that were being held near the same local waterways that the Liquid Waste Management Plan affects.

Webinar

A webinar was held on June 26. It included a presentation about the Liquid Waste Management Plan and its key areas of focus, as well as a Q&A period. The Q&A was held in real-time with questions answered by a panel of subject matter experts from Metro Vancouver. It was open to the public and widely promoted to draw participation, hosting 33 participants.

Online Survey

An online survey was made available on the Metro Vancouver website from June 13 to July 15, and promoted via social media advertising and digital newspaper ads. The survey sought feedback on the key areas of focus for the updated plan. The survey received detailed feedback from 400 respondents.

Youth Groups

Staff met with youth groups to get their input on key focus areas for the next plan. Staff met with Metro Vancouver's Youth and Education Advisory Panel in November 2023 to discuss source control and keeping extra water out of the system, and in April 2024 to get the panel's feedback on the plan's draft goals. Staff also attended Metro Vancouver's Youth4Action Leadership Clinic in March 2024 to get feedback on solutions for sewer overflows and wastewater treatment.

Outreach and Promotion

Public engagement opportunities were promoted regionally. Communications for this phase focused on encouraging the public to take the online survey and attend the webinar to help shape the future of wastewater management in the region. Tactics and interactions included:

- Promoted social media posts reaching 48,699 residents, and gaining over 158,308 impressions (number of times viewed) and 1,425 likes, comments, and shares
- Digital newspaper ads in regional publications, for an estimated 178,990 impressions
- Three emails sent to the Liquid Waste Management Plan project email list of 872 subscribers
- Notice included in two wastewater treatment plant construction e-newsletters

Website

The online survey and webinar were promoted across several of Metro Vancouver's most viewed Liquid Waste Services webpages, and a dedicated project webpage highlighted information about the plan update, along with detailed information about the engagement approach and process, and how to provide feedback.

Social Media

Social media posts on public engagement opportunities were shared on Facebook, Instagram, and X (Twitter). In addition to organic social media posts, paid advertisements were also promoted on Facebook and Instagram.

Digital Newspaper Ads

Ads were published in Black Press and Glacier Media regional digital newspaper publications, resulting in 178,990 impressions, and 236 click-throughs to the webpage.

Outreach	
	**833 visits** to project webpage during public engagement period
	**158,308 impressions and 1,425 engagements** on Facebook, Instagram, and X (Twitter)
	**236 click throughs** on digital newspaper ads
	**3 emails** sent to 870+ email subscribers
	**3 e-newsletters** with information about the webinar and survey

Engagement Participation

The public was invited to provide feedback by completing an online survey. During the online engagement period, 400 participants provided feedback.

Metro Vancouver uses Civil Space (Zencity) for online engagement, providing opportunities for qualitative and quantitative input through preference-ranking open-ended and direct questions. While online engagement is an important component of a comprehensive engagement strategy, it does not provide statistically relevant data.

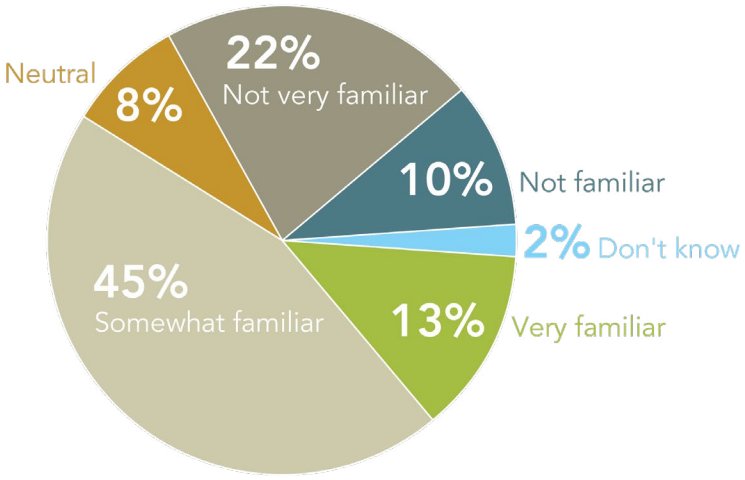
As part of the online survey, participants were asked where they lived. The highest number of respondents lived in Vancouver (39%), District of North Vancouver (10%), and Delta (8%). The majority of respondents indicated they owned their home (68%) and lived in a detached house (67%).

Engagement	
	**9 members** on the public advisory committee developing 13 recommendations for the next plan
	**3 technical workshops** attended by First Nations, member jurisdictions, public advisory committee members, and provincial government representatives
	**400 respondents** to the online survey
	**1,400+ comments** received
	**33 attendees** at webinar
	**500+ people** talked to at public events
Youth4 Action	**2 meetings** with Metro Vancouver's Youth and Education Advisory Panel and **1** Youth4Action Leadership Clinic about the plan update

Feedback Form Results

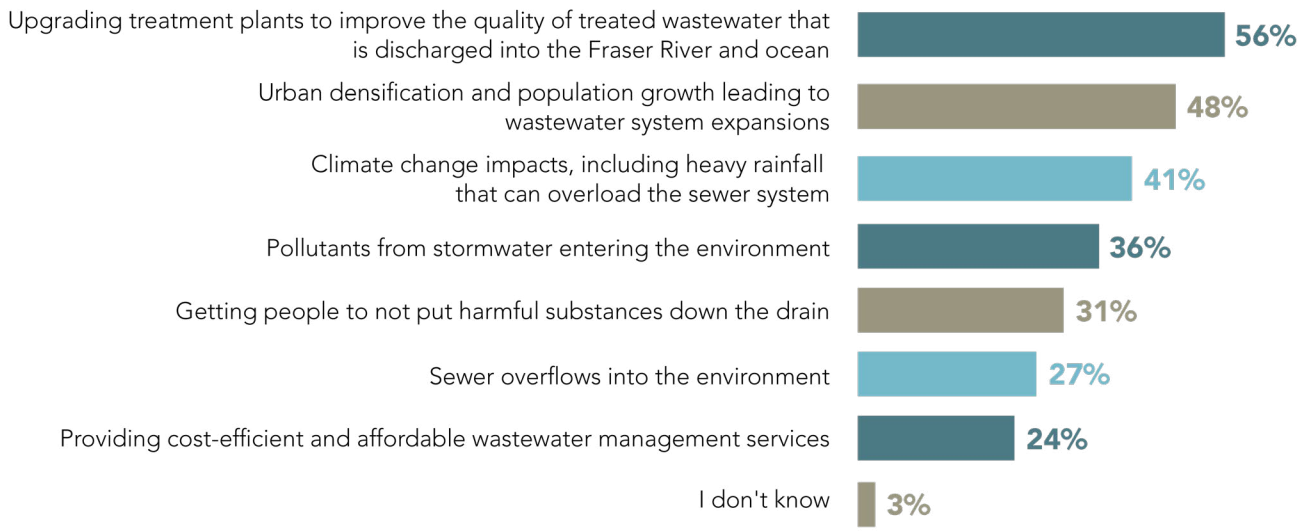
Throughout the online survey, participants were asked for feedback on key focus areas for the updated Liquid Waste Management Plan to address. The feedback on the survey questions is provided below, followed by a more fulsome description of the themes that emerged through the open questions in the survey, and comments shared during the webinar.

How familiar are you with Metro Vancouver's wastewater system?



Overall, the majority of people who took the survey considered themselves familiar in some way with the regional wastewater system (58%), while the rest (42%) were less familiar with the system.

What do you believe are the most critical challenges facing the wastewater system? (Select top three that apply.)

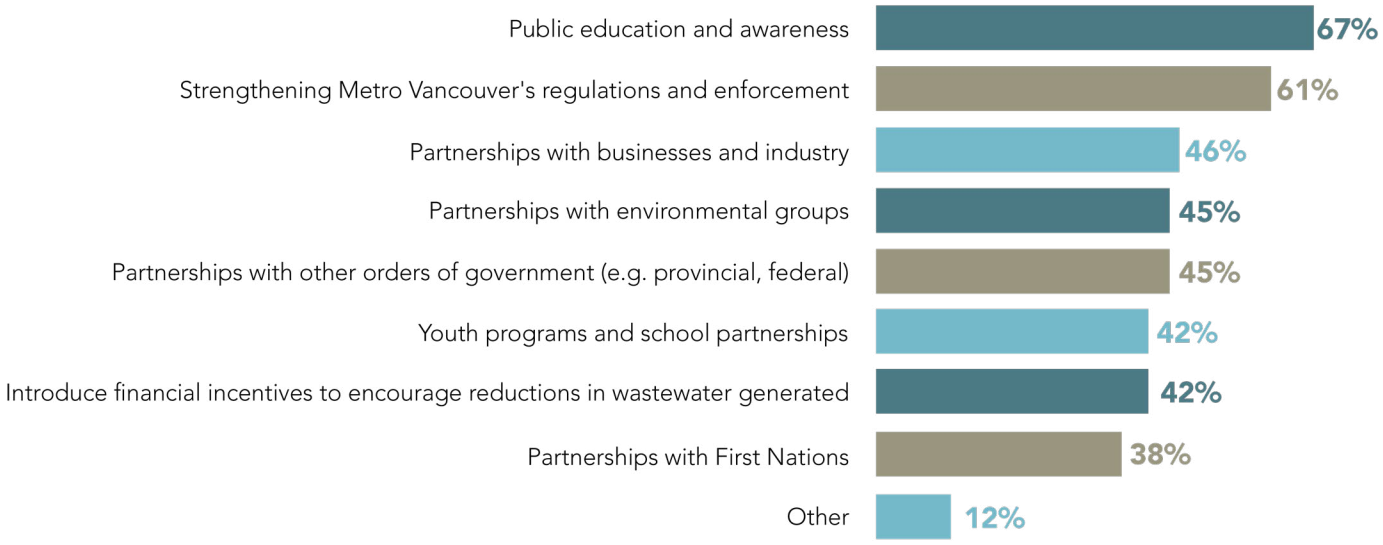


Residents ranked the top three challenges facing the wastewater system as:

1. Upgrading wastewater treatment plants to improve treated wastewater quality
2. Urban densification and population growth leading to the need for wastewater system expansions
3. Climate change impacts

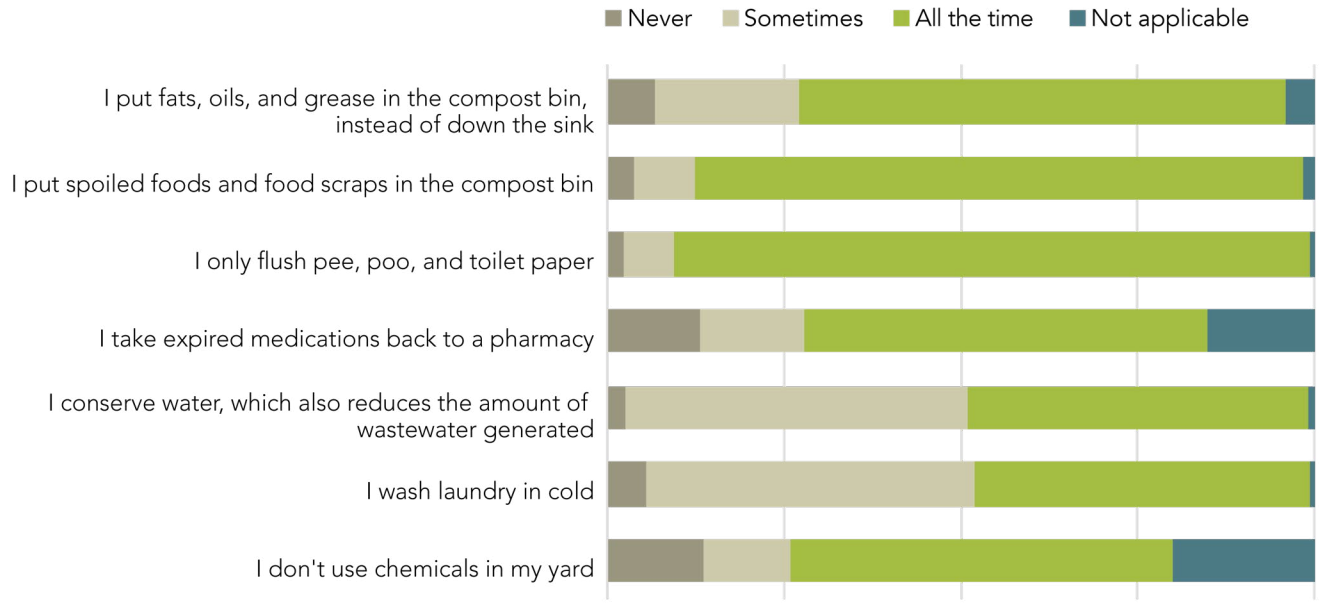
Participants noted additional challenges facing wastewater management in the region, including cost escalations and project oversight on wastewater treatment plant upgrade projects, removing plastics from wastewater, impacts of potential seismic events, outdated building and development standards standing in the way of improved stormwater management, and the need to upgrade aging infrastructure in municipalities across the region in a cost-effective way.

What actions should Metro Vancouver prioritize to help reduce or prevent pollutants from entering our wastewater system? (Select all that apply.)



More than half of participants felt that public education and awareness would be critical to help reduce or prevent pollutants from entering our wastewater system, followed by strengthening Metro Vancouver's regulations and enforcement, and partnerships with business and industry.

How often do you take the following actions to reduce harmful substances from entering the wastewater system?



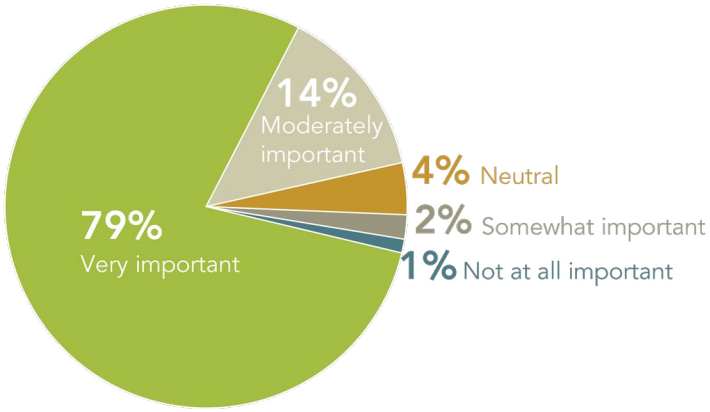
The top three actions that the majority of respondents take to keep harmful substances out of the wastewater system were:

1. Only flushing pee, poo, and toilet paper
2. Putting food scraps in the compost bin
3. Putting fats, oils, and grease in the compost bin

The least common action, conducted by less than half of participants, was washing laundry in cold.

Participants noted additional actions to reduce harmful substances from entering wastewater, including greater regional enforcement and tighter regulations on industrial polluters, continued and enhanced regional public education campaigns, as well as individual actions such as washing cars at facilities that recycle wastewater, keeping catch basins clean by not littering, using plant-based and biodegradable cleaning and personal care products, and recycling hazardous substances appropriately at the recycling depot.

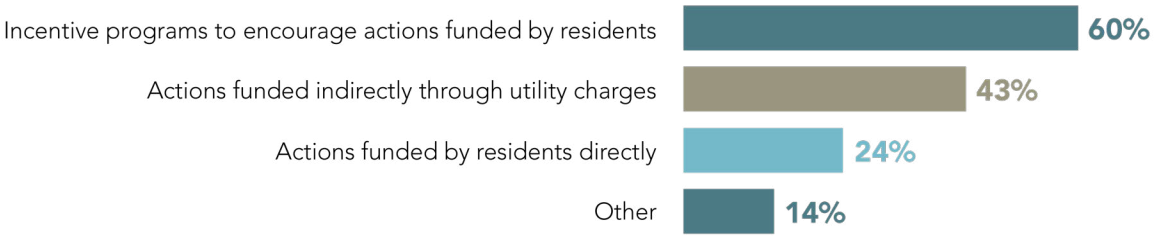
How important is it to you that Metro Vancouver and member municipalities invest in innovative solutions for stormwater management?



The vast majority of participants consider investing in innovative stormwater management solutions as very important (79%) or moderately important (14%) for the future of wastewater management in the region. Fewer than five per cent of participants considered this focus area for the next plan as less than important.

Participants noted additional areas for Metro Vancouver to consider in order to manage stormwater more effectively, including increased green infrastructure and tree canopy, continued sewer separation efforts, updated building and development standards to improve stormwater drainage and water quality, and continued and enhanced public education on the actions residents can take to improve stormwater quality.

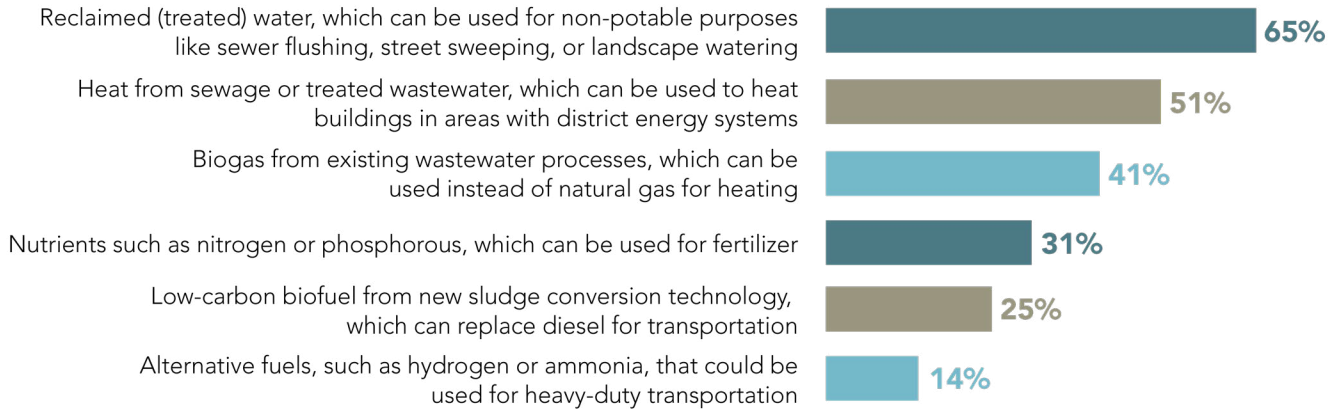
How do you think we should fund actions to keep extra water out of the system? (Select all that apply.)



More than half of respondents supported the development of incentive programs to encourage residents to take action on leaky plumbing in their homes or businesses (which contributes to extra water that overwhelms the system). The remainder supported actions funded through utility charges, or via residents themselves.

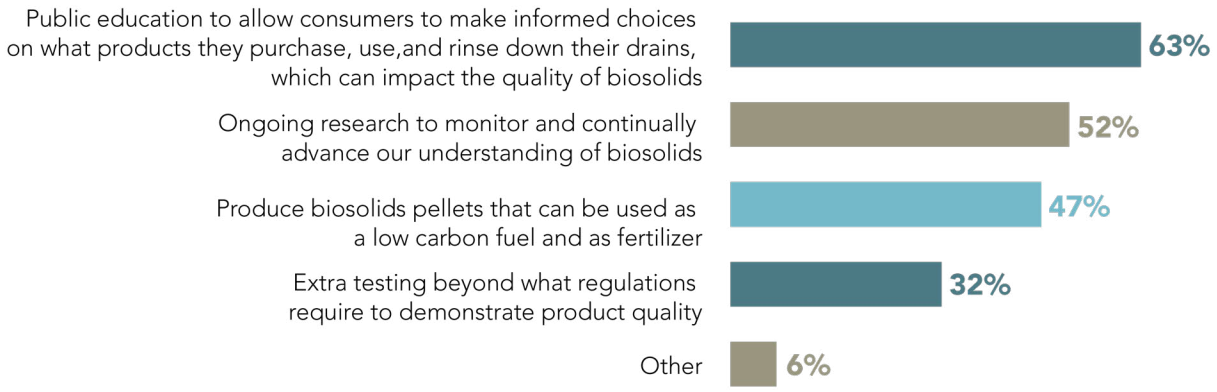
Other ideas included actions funded by business and industry, actions funded by developers, actions funded by other orders of government (provincial, federal), and grant programs.

Which of the following resources recovered from wastewater do you think Metro Vancouver should prioritize in the next plan? (Select top three.)



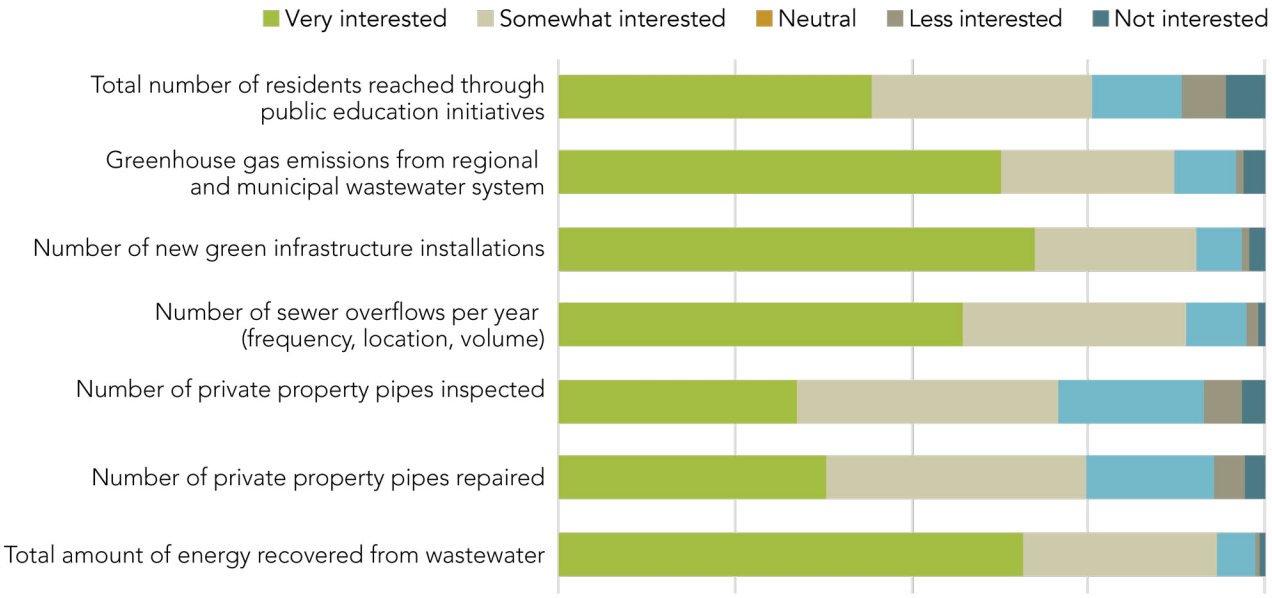
More than half of participants considered reclaimed, treated water as the top resource to be recovered, followed by heat, and biogas.

Metro Vancouver wants to put all of its biosolids to good use. What should Metro Vancouver prioritize to ensure high-quality biosolids continue to be used in the region? (Select all that apply.)



More than half of respondents considered public education a key solution to ensuring high-quality biosolids continue to be used in the region, followed by ongoing monitoring and research, and producing low carbon fuel/ fertilizer biosolids pellets.

How interested are you in seeing Metro Vancouver's progress in the following areas?



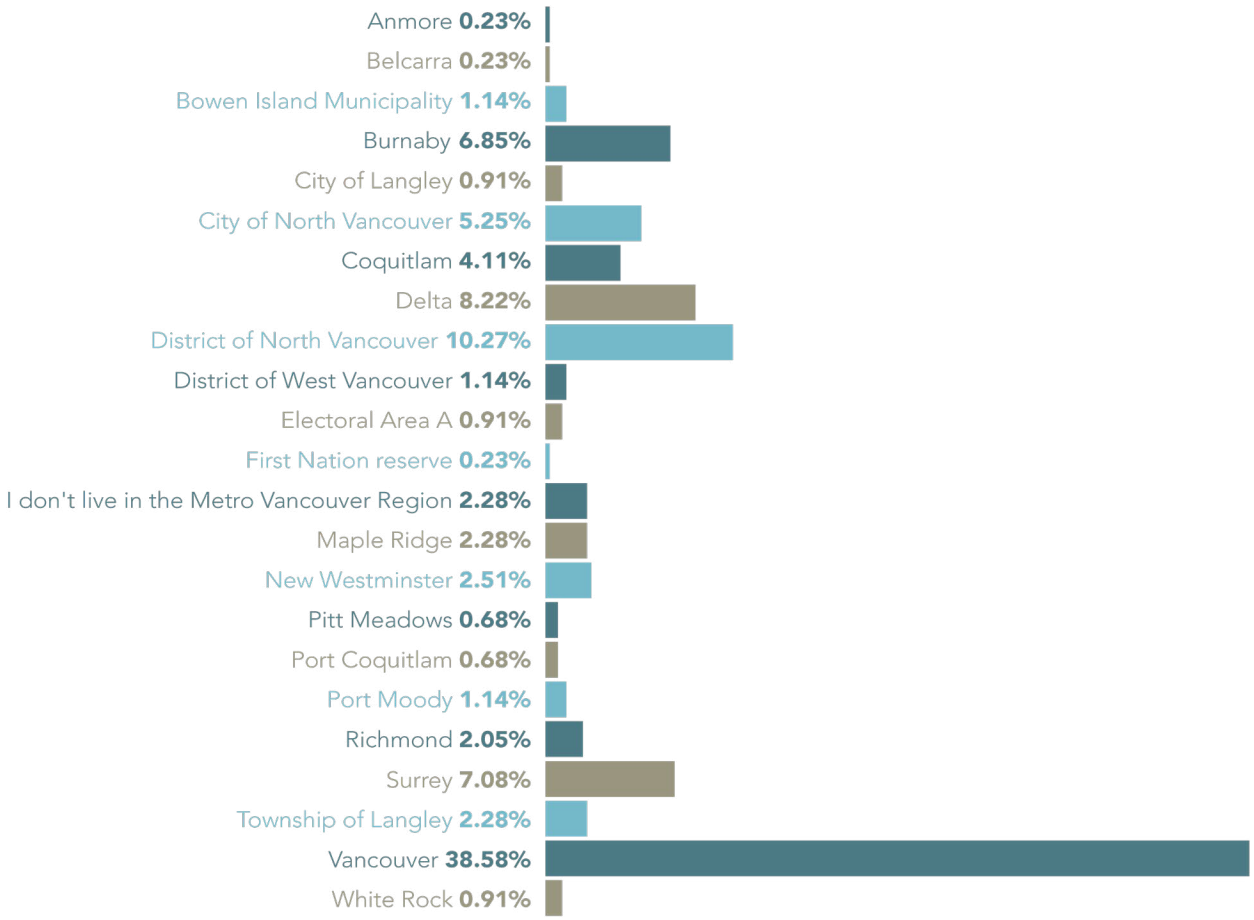
Respondents ranked the top three metrics for Metro Vancouver to continue to monitor progress on the strategies and actions in the updated Liquid Waste Management Plan:

1. Number of new green infrastructure installations in the region
2. Total amount of energy recovered from wastewater
3. Greenhouse gas emissions from regional and municipal wastewater systems.

Participants noted additional metrics they would like to see tracked, including:

- Project budgets and costs
- Oxygen content of creeks and streams
- Whether or not waterways are able to support life
- Contaminant levels in local waterways
- Fisheries and Oceans Canada (DFO) fines for overflows
- Stormwater flow measurements
- Shellfish health and harvesting opportunities
- Integrated Stormwater Management Plan implementation and mitigation measures
- Water use per capita
- Wastewater production per capita/per community
- Tree canopy cover and percentage of its increase/decrease
- Amount of energy consumption to treat wastewater
- Amount of debris/sediment removed from catch basins
- Total distance of new infrastructure built each year (pipes, pump stations)
- Reported incidents of pollutants in creeks
- Level of microplastics in wastewater
- Number of sewer cross-connections fixed
- Fish kill data from streams connected to storm drains
- Quality and volume of wastewater before and after treatment
- Potable water saved through conservation measures
- Biodiversity being restored
- Reductions on a priority list of harmful pollutants

Place of Residence



Feedback Form Results and How We're Responding

These are some of the key themes that we heard through open-ended comments in the online survey and the virtual webinar.

WHAT WE HEARD	HOW WE'RE RESPONDING
Population Growth and Urban Density	
Concerns about how increasing urban density and population growth, in part as a result of provincial housing legislation and federal immigration legislation, will impact the capacity of an already aging wastewater system.	Metro Vancouver updates regional and municipal population projections on a regular basis to guide land use and infrastructure planning. The updated Liquid Waste Management Plan will include strategies and actions to continue to provide services for a growing population in a densifying urban region. Some of the proposed actions for Metro Vancouver and members to address population growth and urban density include: • Creating and updating **Master Sewer Servicing Plans** to plan for and accommodate new and projected growth and development • Aligning and coordinating regional and municipal wastewater management services with the Metro 2050 **Regional Growth Strategy** and municipal **Official Community Plans**
Cost Escalation, Oversight, and Delivery of Major Projects	
Concerns about how cost escalations on the North Shore Wastewater Treatment Plant Program are resulting in significant tax and utility rate increases for affected residents. Calls for an independent review of the project and comments about Metro Vancouver's governance structure.	Metro Vancouver is acutely aware of the concerns around how the updated costs to deliver the North Shore Wastewater Treatment Plant Program will impact residents of this region. We take these concerns seriously. On July 24, 2024, Metro Vancouver's Board of Directors passed a resolution to confirm initiation of an independent performance audit of the North Shore Wastewater Treatment Plant Program. The performance audit will include retaining reputable, experienced external legal counsel to advise the Board on the performance audit. The external legal counsel will work with lawyers representing Metro Vancouver in ongoing litigation related to the North Shore project to develop and recommend a scope of work, terms of reference, and a process for selecting an independent and qualified reviewer. Metro Vancouver will provide updates as available.

WHAT WE HEARD	HOW WE'RE RESPONDING
Cost Escalation, Oversight, and Delivery of Major Projects (Continued)	
Comments about how regional projects are delivered and how costs are allocated. Suggestions to change cost apportionment bylaw to address how costs are allocated. Comments about the need to ensure a skilled workforce is in place to deliver major projects.	Over the course of three Board budget workshops in April and May 2024, the Board discussed the current model of four sewerage areas for Liquid Waste Services cost recovery, as well as the potential implications of moving to a single sewerage area. Under a single sewerage area, costs would be spread evenly across the entire region, rather than varying by location. Staff are planning to update the Board on implications of moving to a single sewerage area at next year's Board Budget Workshop, in spring 2025. Metro Vancouver provides vital services, including clean drinking water and wastewater treatment, to 2.8 million people. We take oversight and management of our projects very seriously. In 2020, we created a Project Delivery department to oversee major projects. We also implemented a new cost estimating framework to provide comprehensive estimates for project costs, and a standardized process to ensure there are regular points for progress reporting on large, multi-year projects. These procedures are consistent and robust and ensure elected officials and staff from Metro Vancouver's member jurisdictions, as well as the public, have insight into project management. The staff, consultants, and contractors working on our projects are selected through rigorous hiring and procurement processes, and are subject to ongoing performance monitoring.

WHAT WE HEARD	HOW WE'RE RESPONDING
Climate Change and Seismic Resilience	
Concerns about wastewater infrastructure being able to withstand and respond to climate change, including extreme weather and ocean acidification.	A key focus for Metro Vancouver as well as the updated Liquid Waste Management Plan is planning for and responding to the impacts of climate change. To protect regional and municipal wastewater infrastructure from the effects of climate change, the updated Liquid Waste Management Plan proposes to enhance **climate resilience** by: • Collaborating with other jurisdictions and organizations to share and analyze climate data in order to regularly update regional climate projections, ensuring that current and future infrastructure planning uses up-to-date climate data and information • Conducting **climate vulnerability assessments** and preparing **climate change adaptation** plans for regional infrastructure • Continuing to plan, locate, design, and adapt infrastructure, assets, and operations to address climate hazards, risks, and vulnerabilities • Conducting research trials at regional infrastructure locations to evaluate the potential of innovative technologies such as **ocean alkalinity enhancement** to remove carbon dioxide from water while mitigating **ocean acidification**, or **biorock** to protect shorelines and create habitat
Concerns about the seismic resilience of the wastewater system, including wastewater treatment plants.	Metro Vancouver designs its wastewater treatment plants to the highest level of seismic performance in the **BC Building Code**. The updated Liquid Waste Management Plan addresses seismic resilience by: • Continuing to plan, locate, design, and adapt infrastructure, assets, and operations to address hazards, risks, and vulnerabilities, including seismic events

WHAT WE HEARD	HOW WE'RE RESPONDING
Stormwater Management	
Concerns about pollutants in stormwater (e.g. road salt, sediment, metals, oils, 6PPD quinone from car tires) harming fish-bearing rivers and streams. Suggestions to increase monitoring and mitigation efforts and explore stormwater treatment options.	The regulation of pollutants in stormwater is beyond Metro Vancouver's mandate and rests with other orders of government, while the management of stormwater falls primarily under the jurisdiction of local municipalities. Local municipalities manage the impact of stormwater on local waterways through their **Integrated Watershed Management Plans**, formerly known as Integrated Stormwater Management Plans. Municipalities will continue to monitor waterways using the **Adaptive Management Framework**, and update their Integrated Watershed Management Plans as necessary to mitigate pollutants, and explore treatment options. Metro Vancouver and its member jurisdictions participate in a **Stormwater Interagency Liaison Group**, with a mandate to advise and work through technical stormwater issues with Metro Vancouver member jurisdictions and other government agencies. This group will be restructured as part of the Liquid Waste Management Plan update to lead local research on stormwater and act as the primary regional advocate with provincial and federal regulators to advance concerns about stormwater pollutants.
Comments supporting the use of green infrastructure. Suggestions for Metro Vancouver to support municipalities with these efforts.	A key focus for stormwater management in the updated Liquid Waste Management Plan is the enhancement and expansion of green infrastructure in the region.
Suggested actions to incentivize (or mandate, where possible) residents, industry, and businesses to manage stormwater effectively. Examples of such approaches include disconnecting downspouts, increasing tree canopy, installing permeable surface in developments, protecting and enhancing riparian areas, and installing rain gardens, bioswales, green roofs, natural lawns, detention ponds, and porous pavement.	Some proposed actions for Metro Vancouver and members include: • Member jurisdictions will expand the use of **green infrastructure, blue infrastructure**, and other practices to mimic natural watersheds, reduce runoff and discharge, improve water quality, and increase climate resilience. These approaches will also support the effectiveness of the region's **grey infrastructure** • Member jurisdictions will update and harmonize rainwater policies, programs, and bylaws, improving the implementation of green infrastructure across the region Metro 2050, the Regional Growth Strategy, also states that member jurisdictions will adopt **Regional Context Statements** that identify local ecosystem protection and tree canopy cover targets, and demonstrate how these targets will contribute to the regional targets

WHAT WE HEARD	HOW WE'RE RESPONDING
Stormwater Management (continued)	
Suggestions to update building and development standards with effective solutions to encourage green infrastructure.	The updated Liquid Waste Management Plan proposes that Metro Vancouver and members will seek an update to the **Master Municipal Construction Documents** so that green infrastructure guidelines become standards, helping to improve and expand green infrastructure implementation across the region.
Establish site-specific standards for on-site or adjacent public land infiltration of roof and pavement runoff to protect local streams by filtering out pollutants and decreasing flows during storms and flooding. Stormwater storage should also be considered for the same reason. Concerns about increased stormwater runoff that will result from increased urban density.	Expanding the use of green infrastructure is a key focus of the Liquid Waste Management Plan. Green infrastructure solutions mimic natural systems that slowly infiltrate rainwater into the ground, better filtering the runoff to help reduce pollutants and slowing down flows to help reduce flooding. The updated Liquid Waste Management Plan also proposes to seek an update to the Master Municipal Construction Documents so that green infrastructure guidelines become standards, which will allow developers to refer to a common set of approaches and instructions. As for stormwater storage, municipal Integrated Watershed Management Plans develop stormwater actions, which could identify areas for green infrastructure and stormwater storage where appropriate.
Comments about the importance of Metro Vancouver and municipalities collaborating to conduct watershed-scale stormwater management. Comments about the importance of aligning stormwater management and land use planning.	Land use planning and watershed health are inextricably linked, and must be considered holistically. Metro Vancouver and members use Integrated Watershed Management Plans to balance land use planning; stormwater engineering; flood and erosion protection; and environmental protection. The updated Liquid Waste Management Plan has actions to help member jurisdictions better align land-use planning and development with their Integrated Watershed Management Plans to ensure development decisions support watershed health objectives, including protecting riparian areas. Members in the same watershed will also collaborate with each other and with First Nations to develop and update Integrated Watershed Management Plans to ensure that watersheds are managed holistically. Metro 2050, the Regional Growth Strategy, also lays out actions to support the alignment of land use planning and stormwater management. (See action 3.2.7 in **Metro 2050**.)

WHAT WE HEARD	HOW WE'RE RESPONDING
Stormwater Management (continued)	
Suggestions to lobby other orders of government to regulate stormwater pollution.	Metro Vancouver and its member jurisdictions have a Stormwater Interagency Liaison Group, with a mandate to advise and work through technical stormwater issues with Metro Vancouver member jurisdictions and other government agencies. The updated Liquid Waste Management Plan includes an action to revise the group's terms of reference to lead local research on stormwater and act as the primary regional advocate with provincial and federal regulators.
Suggestions to increase street cleaning and catch basin maintenance. Suggestions for community "adopt a catch basin" programs.	Street cleaning and catch basin maintenance are municipal activities and some municipalities have programs similar to "adopt a catch basin." While these kinds of programs are up to the individual municipalities, the updated Liquid Waste Management Plan has several actions to enhance collaboration throughout the region on stormwater management, including hosting a regular forum on stormwater management practices among member jurisdictions, First Nations, and other interested parties, which could support the advancement of municipal programs like these.
Suggestions to implement a stormwater fee or utility to fund more stormwater management measures.	Dedicated funding will be critical to support effective stormwater management in the region. The updated Liquid Waste Management Plan will propose that members establish dedicated stormwater funding within three years to ensure consistent and reliable service delivery for stormwater management.
Suggestions to accelerate the daylighting of streams.	Daylighting streams is largely a municipal initiative and often included in their sewer separation or watershed management plans. Stream daylighting can also be explored and recommended in the municipal Integrated Watershed Management Plans. The updated Liquid Waste Management Plan proposes that a template be developed for an online stormwater data dashboard for member jurisdictions to publicly report on Integrated Watershed Management Plan progress and key indicators of watershed health. The length of daylighted waterways has been suggested as a potential metric, which would likely encourage more daylighting of streams.

WHAT WE HEARD	HOW WE'RE RESPONDING
Wastewater Treatment	
Comments about future-proofing wastewater facilities for population growth, climate change, and future regulations.	The updated Liquid Waste Management Plan proposes the following actions to continue to design and plan for population growth, climate change, and potential future regulation changes: • Continue to conduct climate change vulnerability assessments and prepare adaptation plans for Metro Vancouver infrastructure, assets, and operations in each sewerage area to enhance resilience to future climate conditions (updating existing ones and creating new ones where needed) • Create and update Master Sewer Servicing Plans to accommodate growth and development Metro Vancouver will continue to follow the risk assessment approach established by the **Canadian Council of Ministers of Environment Canada-wide Strategy for Management of Municipal Wastewater** (CCME CWS-MMWW) to meet regulatory requirements. Metro Vancouver will identify and pursue risk mitigation approaches including source control, treatment process optimization, and treatment upgrades. Metro Vancouver has planned wastewater treatment projects to improve effluent quality and accommodate a growing population.
Comments urging Metro Vancouver to address odour at wastewater treatment plants and across the wastewater system.	Metro Vancouver understands that odour is a concern for community members living near wastewater treatment plants. Wastewater treatment plants are designed to manage odour. New wastewater treatment plants and new treatment process units added to existing plants are designed to meet stringent, modern odour criteria. As such, all of Metro Vancouver's wastewater treatment plants are improving odour controls as plants are upgraded and improved.
Suggestions to consider small, decentralized wastewater treatment plants to improve water quality and reduce load on the large plants.	Previous studies that examined decentralized wastewater treatment plants have shown that this approach would not be feasible in the region due to land tenure, complexity, cost, and regulatory requirements. In addition, Metro Vancouver would still need to operate all five of its existing wastewater treatment plants to continue to meet the needs of the region. For this reason, decentralized wastewater treatment plants are not being considered at this time.

WHAT WE HEARD	HOW WE'RE RESPONDING
Wastewater Treatment (continued)	
Comments about the need to prioritize upgrades to all wastewater treatment plants to remove more pollutants, regardless of cost.	Metro Vancouver follows the Canadian Council of Ministers of Environment Canada-wide Strategy for Management of of Municipal Wastewater (CCME CWS-MMWW) Environmental Risk Management Framework to determine effluent discharge objectives and meet National Performance Standards. If this prescribed process identifies potential environmental risk, it may lead to actions such as source control initiatives, treatment process optimization, and wastewater treatment plant improvements and upgrades. When considering level of treatment for wastewater treatment plant improvements and upgrades, Metro Vancouver considers factors including funding availability, First Nations concerns, societal values, and stakeholder input from engagement on projects. The site-specific effluent discharge objectives are set for Metro Vancouver wastewater treatment plants based on relevant water quality guidelines, including site-specific water quality objectives where available. When the federal or provincial governments review these water quality objectives/guidelines, First Nations are invited by the presiding government to provide input, and can provide direct feedback on water quality objectives/guidelines. The CCME-CWS-MMWE process requires ongoing monitoring of wastewater and the receiving environment to verify that wastewater treatment plants are continuing to meet the receiving environment water quality objectives and guidelines and operating without an adverse effect on the environment.

WHAT WE HEARD	HOW WE'RE RESPONDING
Wastewater Treatment (continued)	
Comments about how Metro Vancouver should adhere to provincial and federal regulatory requirements and not upgrade wastewater treatment plants beyond these requirements, to reduce costs.	Metro Vancouver follows the Canadian Council of Ministers of Environment Canada-wide Strategy for Management of of Municipal Wastewater (CCME CWS-MMWW) Environmental Risk Management Framework to determine effluent discharge objectives and meet National Performance Standards. If this prescribed process identifies potential environmental risk, it may lead to actions such as source control initiatives, treatment process optimization, and wastewater treatment plant improvements and upgrades. When considering level of treatment for wastewater treatment plant improvements and upgrades, Metro Vancouver considers factors including funding availability, First Nations concerns, societal values, and stakeholder input from engagement on projects. The site-specific effluent discharge objectives are set for Metro Vancouver wastewater treatment plants based on relevant water quality guidelines, including site-specific water quality objectives where available. When the federal or provincial governments review these water quality objectives/guidelines, First Nations are invited by the presiding government to provide input, and can provide direct feedback on water quality objectives/guidelines. The CCME-CWS-MMWE process requires ongoing monitoring of wastewater and the receiving environment to verify that wastewater treatment plants are continuing to meet the receiving environment water quality objectives and guidelines and operating without an adverse effect on the environment.
Combined Sewer Separation	
Requests for Metro Vancouver and municipalities with combined sewers (Vancouver, New Westminster, and Burnaby) to accelerate separation of these sewers to prevent overflows.	Several proposed actions in the updated Liquid Waste Management Plan encourage and expedite combined sewer separation, including developing five-year intermediate targets for municipal and regional separation of prioritized combined **catchments**. Other actions focus on reducing **combined sewer overflows** and their impacts on the receiving environment, through system optimization and operational controls.

WHAT WE HEARD	HOW WE'RE RESPONDING
Combined Sewer Separation (continued)	
Comments about the importance of improving water quality through better management of stormwater and rainwater (and the pollutants its runoff carries) while sewer separation work is ongoing.	There are numerous proposed actions in the updated Liquid Waste Management Plan to mitigate the impacts to water quality while sewer separation efforts continue, including: • Continued and enhanced monitoring and analysis of combined sewer overflows' impact on the environment • Continued and enhanced wastewater system optimization to minimize the volume and sanitary sewage loading of sewer overflows • Initiatives to expand and enhance the use of green infrastructure to manage stormwater flows and pollutants
Aging Infrastructure	
Concerns that deferred maintenance and underfunding could lead to system failures and inefficiencies.	In the updated Liquid Waste Management Plan, proposed actions for Metro Vancouver and members to continue to maintain the condition and performance of the sewerage system include: • Inspecting sanitary sewers on a twenty-year cycle • Maintaining current maps of sewerage inspection, condition, and repairs • Continuing to develop and implement **asset management plans** that address risks, including climate change and seismic events, and target a 100-year replacement or rehabilitation cycle for sewerage infrastructure
Comments about the importance of considering all the costs assets will incur over their lifespans (life cycle costing) to determine where we need to invest to protect the environment for current and future generations.	Metro Vancouver integrates life cycle cost analysis into the capital planning process for new and upgraded infrastructure projects. In addition to financial considerations, we prioritize other factors including impacts to human health and the environment, to ensure responsible and sustainable infrastructure development. Metro Vancouver and its members are committed to the long-term stewardship of sewerage infrastructure. The updated Liquid Waste Management Plan includes an action for Metro Vancouver and member jurisdictions to continue to develop and implement asset management plans that target a 100-year replacement or rehabilitation cycle for sewerage infrastructure.

WHAT WE HEARD	HOW WE'RE RESPONDING
Affordability	
Comments about the importance of providing quality wastewater management in an economically sustainable way for current and future generations.	One of the goals of the updated Liquid Waste Management Plan is to reduce demands on the system. Reducing the inputs into the wastewater system – both volume of flow and loading of organic material – enables smaller infrastructure to serve a growing population. Lowering the demands on the system can defer expansions, which saves money in the long run and keeps the system affordable. Asset management practices such as the development of asset management plans will ensure that Metro Vancouver is maximizing the full value of regional assets over their lifecycle.
Suggestions to seek funding for wastewater treatment plant and system upgrades from the federal and provincial governments, as well as industry and developers.	Metro Vancouver derives funding from a number of sources, including federal and provincial contributions to major project upgrades. Developers contribute through **Development Cost Charges** for new residential and non-residential developments, which help pay for new sanitary sewer works expansions that are needed to deliver wastewater services to the future occupants of these buildings. These fees are defined in the Development Cost Charge Bylaw and new rates will be phased in over three years beginning January 1, 2025. Contributions from industry can take various forms, such as direct funding for mutually beneficial projects such as the pilot project with Parkland Fuel Corporation to investigate how to create biocrude oil from wastewater solids, or in-kind contributions to support project development.
Comments about the importance of investing in wastewater treatment now, as costs will only escalate in the future.	The last few years have seen an escalation in construction costs paired with a labour shortage that has caused significant cost increases in the industry. With the population expected to increase, it is vital that we invest in new infrastructure. In addition, much of the existing wastewater infrastructure is aging and in need of replacement. Delays to building new infrastructure carry environmental risk and potential for regulatory non-compliance. Metro Vancouver is aware of these factors and is continuing work to upgrade the system.
Suggestions to spread the costs to upgrade wastewater treatment plants and the wastewater system across the region, in conjunction with water metering.	Upgrade costs are allocated across the Metro Vancouver sewerage districts. All municipalities pay for the capital costs of new facilities, but those within a particular district pay a larger share for facilities in their district. Metro Vancouver's Board has directed staff to examine alternative options for cost allocation of major projects in the future.

WHAT WE HEARD	HOW WE'RE RESPONDING
Resource Recovery and Biosolids	
Comments about how Metro Vancouver should reuse treated wastewater, rather than returning it to the Fraser River and ocean.	Metro Vancouver's wastewater treatment plants already use treated effluent onsite for non-potable processes. We are working on ways to increase the use of treated wastewater in the region. Treated wastewater can be further treated to higher standards for use as reclaimed water. This includes outdoor and industrial uses such as sewer flushing, street sweeping, hydrovac excavation, landscape watering, and street-tree watering. Using reclaimed water helps conserve drinking water. Reclaimed water facilities with truck fill stations are being planned at the new North Shore, Northwest Langley, and Iona Island wastewater treatment plants.
Concerns that regardless of monitoring and treatment, harmful contaminants (e.g. PFAS, hormones, medicines, microplastics) are still present in biosolids. Concerns about biosolids being used around groundwater or public places and comments about the importance of stringent biosolids testing.	Because they are prevalent in our daily lives, compounds such as **per- and polyfluoroalkyl substances (PFAS)**, hormones, medicines, and microplastics are found in trace amounts in our bodies, our homes, our environment, our wastewater, and in biosolids. Studies show that our exposure to these compounds from common household products (e.g. soaps, shampoo, non-stick cookware) is far greater than our exposure to the trace amount found in biosolids. Provincial **biosolids** regulations have specific requirements for land application of biosolids and for the quality of soil that is made with biosolids. These requirements are designed to protect water bodies, human health, and the environment. Metro Vancouver follows a rigorous quality control program and performs thousands of tests every year to ensure that biosolids are high quality and always meet or surpass provincial and federal biosolids regulations. Metro Vancouver also tests its biosolids for unregulated parameters and partners with other organizations and research institutions to stay current with the available science to advance our understanding.

WHAT WE HEARD	HOW WE'RE RESPONDING
Water Conservation	
Comments about the importance of encouraging greywater use.	Metro Vancouver supports the concept of greywater use as an important water conservation measure, and has published a **Non-Potable Water Systems Guidebook** to support greywater use in the region.
Comments about how reducing the wastewater that enters wastewater treatment plants results in cost savings. Comments about how water metering should be required across the region to encourage water conservation.	Actions to advance water conservation in the next Liquid Waste Management Plan include: • Encouraging member jurisdictions to implement residential water metering programs. • Developing a region-wide water conservation program for the institutional, commercial, industrial, and agricultural sectors
Public Education	
Calls for more public education for source control, water conservation, the hydrologic cycle, keeping extra water out of the system from private plumbing, and stormwater management actions that can be taken in our homes and businesses.	Metro Vancouver is committed to educating the public on the importance of water, wastewater, and the role everyone has to play to help keep our local waters healthy. Regional campaigns are run every year to reduce **grease**, **unflushables** (e.g. baby wipes, hair, and medicines), **microfibres** (from laundering of textiles), **surfactants** (a chemical in soaps and detergents that is harmful to marine life) and excess water in the sewer system from inflow and infiltration. Water restrictions are in effect from May 1 to October 15, and we **communicate** these restrictions and share best practices for maintaining healthy lawns while reducing water use. The annual **water conservation behaviour change campaign** conveys the value of water and encourages residents to use our treated drinking water wisely so we have it for where it's needed most: cooking, cleaning, and drinking. Metro Vancouver also provides **stormwater management resources** for municipalities and residents.
Suggestions to educate youth as their understanding and action will be key to long-term, societal behaviour changes.	Metro Vancouver supports teachers and youth with resources and experiential learning opportunities to connect to local sustainability topics such as wastewater management, climate change, and ecological health. This is done through Metro Vancouver's K-12 curriculum-connected resources, tours for school groups, and leadership programs for youth.

WHAT WE HEARD	HOW WE'RE RESPONDING
Cruise Ship and Marine Vessel Waste	
Concerns that cruise ships and other marine vessels in the region's inlets and marinas are dumping waste that is harmful to the environment.	Metro Vancouver is aware of this discharge source and knows that it impacts water quality in the region. Discharges from marine vessels such as cruise ships into the marine environment are regulated by the federal government (Transport Canada). The Government of Canada also requires ships to comply with requirements in the International Convention for the Prevention of Pollution from Ships (MARPOL). Advocating directly to Transport Canada and MARPOL about their cruise ship and marine vessel discharge requirements would be an ideal way to encourage change.
Environmental Management	
Concerns about E.coli contamination worsening in places like False Creek.	E. coli concentrations vary day to day, and year to year. There have been periods of elevated counts, where a source of contamination was identified and infrastructure repaired, thereby reducing E. coli concentrations. The last five years of monitoring results are available in Appendix B of Metro Vancouver's **Environmental Management and Quality Control Annual Report**. The Metro Vancouver **website** also has links to Environmental Management and Quality Control Annual Reports for the last five years.
Comments that Metro Vancouver should identify a priority list of harmful pollutants in stormwater and find ways to reduce/mitigate.	The regulation of stormwater discharges is beyond Metro Vancouver's mandate and rests with higher orders of government, while the management of stormwater falls, for the most part, under the jurisdiction of local municipalities. Local municipalities manage the impact of stormwater pollutants on local waterways through their Integrated Watershed Management Plans. Municipalities will continue to monitor waterways using the Adaptive Management Framework, and update their Integrated Watershed Management Plans as necessary to mitigate pollutants, and explore treatment options. Metro Vancouver and its member jurisdictions have a Stormwater Interagency Liaison Group, with a mandate to advise and work through technical stormwater issues with Metro Vancouver member jurisdictions and other government agencies. This group will be restructured as part of the Liquid Waste Management Plan update to lead local research on stormwater and act as the primary regional advocate with provincial and federal regulators to advance concerns about stormwater pollutants.

WHAT WE HEARD	HOW WE'RE RESPONDING
First Nations Collaboration	
Comments about the importance of collaborating with First Nations to listen to, learn from, and incorporate their views.	Enhancing and improving meaningful engagement with First Nations on regional and municipal projects and plans is a key area of focus for the updated Liquid Waste Management Plan. A proposed goal for the updated plan is to reflect First Nations' priorities and respect Indigenous Knowledge and the Rights of Indigenous Peoples while collaborating on areas of shared significance to improve environmental and public health outcomes for all. Some specific proposed actions in the updated Liquid Waste Management Plan to collaborate with First Nations include: • Working with First Nations to develop a framework to prioritize combined sewer separation efforts • Members will work with First Nations to prioritize watersheds for Integrated Watershed Management Plan development using criteria co-developed with First Nations that consider watershed health and cultural significance as well as Indigenous Rights • First Nations will participate in Integrated Watershed Management Plan development, monitoring, and review • A forum will be held at regular intervals to report progress on stormwater management actions, and to foster collaboration and knowledge sharing among member jurisdictions, First Nations, and other interested parties
Source Control	
Calls to work with the federal government to ban products and chemicals that are harmful to human health and the environment.	The updated Liquid Waste Management Plan includes a proposed action to advocate for increased provincial and federal regulations on the manufacturing and use of products with contaminants.
Calls for more enforcement and higher penalties for industrial and commercial polluters.	A new bylaw (GVS&DD Notice of Bylaw Violation Enforcement and Dispute Adjudication Bylaw) was adopted by the Metro Vancouver Board in July 2024. This bylaw provides additional enforcement tools, including penalty amounts up to $500, to encourage compliance with Metro Vancouver's liquid waste bylaws. Metro Vancouver reviews and updates its bylaws and fees regularly.

WHAT WE HEARD	HOW WE'RE RESPONDING
Source Control (continued)	
Suggestions to make the disposal of hazardous substances easier for residents.	Metro Vancouver will continue to provide guidance for residents on how to dispose of common household chemicals, such as paint, motor oil, antifreeze, gas, pesticides, and flammable liquids through **Metro Vancouver Recycles**.
Comments about the importance of educating the public about the critical nature of preventing and reducing pollution in our homes and businesses. Specific comments about education on cleaning and personal care product alternatives that are better for the environment.	Proposed actions in the updated Liquid Waste Management Plan include continuing public education on preventing and reducing pollution at the source, through outreach and education to residents and businesses, and youth education programs. Metro Vancouver provides a resource with healthier options for household cleaning products: **Better Solutions: Reducing the impact of household chemicals on our waterways**
Suggestion to require the installation of washing machine filters to remove microplastics.	While the use of filters would help capture microfibres released during the wash, the captured microfibres are generally disposed of in the garbage and could eventually make their way back into the environment. Preventing microfibers from making their way into the system is a more effective approach.
Keeping Extra Water Out of the Wastewater System	
Calls to educate the public on ways to keep extra water out of the wastewater system and encourage or require residents to inspect private pipes, and replace or repair them, as needed. Suggestions to introduce incentive and rebate programs.	While Metro Vancouver currently has education initiatives to educate the public about extra water coming into the system from private sewer pipes on residential and commercial properties (called "**inflow and infiltration**"), the updated Liquid Waste Management Plan proposes to expand public education messaging on the relationship between inflow and infiltration and efficient liquid waste management, showing that investing in water-tight (i.e. correctly built and in good condition) private pipes is an effective strategy that can protect the environment and reduce regional infrastructure costs — and ultimately the taxpayer. The updated Liquid Waste Management Plan proposes the following actions: • Metro Vancouver to explore and analyze various approaches for incentives or funding programs to encourage property owners to rehabilitate leaky pipes • Members to develop and provide these incentive or funding programs

WHAT WE HEARD	HOW WE'RE RESPONDING
Keeping Extra Water Out of the Wastewater System (continued)	
Comments that it would be most effective if Metro Vancouver and members were responsible for inspecting and replacing leaky private pipes.	The updated Liquid Waste Management Plan proposes actions for member jurisdictions to require the replacement of private sewer pipes during new construction or renovation. There are actions for members to develop consistent processes to access private properties to conduct inspections when appropriate, and to direct staff to enforce bylaws on private property to prevent unauthorized discharge or rainwater or groundwater to sanitary sewers.

How Feedback Will Be Used

Public feedback will be considered as we finalize the draft Liquid Waste Management Plan during the next engagement phase. We have heard some key themes and priorities for the next plan in our engagement to date, and we are considering ways to achieve these priorities in the next plan, and working on them now as part of projects and improvements already underway throughout Metro Vancouver's liquid waste system.

Next Steps

Metro Vancouver will consider the feedback from the second phase of engagement as we continue to refine and finalize a draft plan, based on direction from the Liquid Waste Committee received in late fall 2024. The third and final phase of engagement will include engagement with First Nations, member jurisdictions, and the public prior to submitting the plan to the provincial Ministry of Environment and Climate Change Strategy for its consideration, feedback, and approval.

Glossary

Adaptive Management Framework provides an approach for monitoring watershed health, monitoring the progress and effectiveness of **Integrated Watershed Management Plans**, identifying impacts/threats to watershed health, and identifying mitigation approaches. It is a continuous improvement process that promotes flexible decision making that can be adjusted over time as the outcomes of Integrated Watershed Management Plan actions are better understood.

Asset management plans are developed by utilities and municipalities to maintain and replace infrastructure assets, such wastewater systems, to ensure reliability, sustainability, and cost-effectiveness over their life cycle.

BC Building Code is a provincial regulation that governs how new construction, building alterations, repairs, and demolitions are completed. This code establishes minimum requirements for safety, health, accessibility, fire and structural protection of buildings, and energy and water efficiency. It applies throughout the province except for some federal lands and the City of Vancouver.

Biorock is a durable material formed underwater from naturally occurring ingredients in seawater, which can be used to protect shorelines from erosion and create marine habitat, while sequestering carbon.

Biosolids are the treated solids recovered from wastewater. The solids have been treated by microorganisms and heat to eliminate pathogens and reduce odours. The final product is similar to soil and is rich in nutrients and organic matter.

Blue infrastructure refers to natural and engineered systems that manage water, including natural water bodies like rivers, lakes, and wetlands, as well as engineered solutions such as constructed wetlands and retention ponds.

Canadian Council of Ministers of Environment Canada-wide Strategy for Management of Municipal Wastewater (CCME CWS-MMWW) – the strategy articulates the collective agreement reached by the 14 Ministers of Environment in Canada to ensure that wastewater facility owners have regulatory clarity in managing municipal wastewater effluent under a harmonized framework that is protective of human health and the environment.

Catchment refers to an area of land where collected rainwater and groundwater feed to a single point in the sewer system.

Climate change adaptation means anticipating, planning for, and responding to the adverse effects of climate change and taking appropriate action to prevent or minimize the damage it can cause, or taking advantage of opportunities that may arise. It has been shown that well-planned, early adaptation action saves money and lives later.

Climate resilience describes the capacity of ecosystems, economies, infrastructure, and communities to absorb the impacts of climate change while maintaining essential services and functions needed to support health and well-being. In some cases, climate resilience involves changing services and functions so they are more sustainable.

Climate vulnerability assessments for infrastructure identify the assets and individual components of infrastructure that are most likely to be impacted by projected changes in climate. Existing infrastructure may not be able to withstand the weather extremes caused by climate change, or may not be able to function at required performance levels under extreme events driven by climate change.

Climate vulnerability is the degree to which ecosystems, economies, infrastructure, and communities are susceptible to, or unable to cope with, the adverse effects of climate change. Vulnerability varies based on exposure, sensitivity, and adaptive capacity.

Combined sewers carry both sanitary wastewater and rainwater in a single pipe and exist only in older parts of Vancouver, Burnaby, and New Westminster. During dry weather, combined sewers convey all sanitary wastewater to wastewater treatment plants.

Combined sewer overflow is a discharge of sewage from a combined sewer into a water body, caused by excess water entering the combined sewer system during heavy rainfall. The combined sewer system was designed to overflow in this manner to avoid sewage backups into homes and businesses.

Development cost charges are fees collected from developers at the time of a building permit to help pay for the cost of infrastructure required to provide municipal services to new development, such as roads, transit, and water and sewer infrastructure.

Green infrastructure includes natural, enhanced, and engineered systems and practices that manage rainwater and mitigate negative impacts of urban development. These natural assets (e.g. forests, wetlands, and soil), enhanced assets (e.g. urban trees and bioswales), and engineered systems (e.g. green roofs, rain gardens, and permeable pavement) help absorb and filter stormwater to reduce flooding, improve water quality, and enhance urban biodiversity.

Grey infrastructure means traditional engineered infrastructure, such as pipes, pumps, and treatment plants, used to manage rainwater and wastewater. For rainwater management, grey infrastructure includes storm sewers and retention basins.

Infiltration is rainwater or groundwater that enters a sanitary sewer due to leaky or damaged pipes.

Inflow is rainwater that enters a sanitary sewer due to improperly connected roof or foundation drains.

Integrated Watershed Management Plans, formerly referred to as Integrated Stormwater Management Plans, provide direction for future development plans and identify infrastructure needs while better understanding the impacts of development on the environment. The goal is to balance land use planning, stormwater engineering, flood and erosion protection, and environmental protection.

Master Municipal Construction Documents are a standardized set of general conditions, standard specifications and drawings, and design guidelines for the design, construction, and management of municipal infrastructure projects in British Columbia.

Master Sewer Servicing Plan is a comprehensive plan outlining the development, maintenance, and improvement of a municipality's sewer system to meet current and future needs.

Nutrifor is the brand name for the biosolids that Metro Vancouver produces.

Ocean acidification is caused by rising carbon dioxide levels in the atmosphere due to climate change, which transfers carbon dioxide into ocean water, making it more acidic and negatively impacting shellfish and other marine life.

Ocean alkalinity enhancement is a carbon removal approach that involves adding alkaline minerals to the ocean so it can absorb additional carbon dioxide from the atmosphere, to help mitigate climate change and ocean acidification.

Annacis WWTP Trickling Filter Dome Replacement

Official Community Plan is a comprehensive policy document adopted by a municipal council or regional board that outlines the long-term vision, objectives, and policies for land use, development, and infrastructure within a community. An Official Community Plan addresses various aspects of community planning, including housing, transportation, parks, and utilities, and provides guidance on managing growth and development in a sustainable and orderly manner. The plan must align with provincial legislation and regional growth strategies.

Per- and polyfluoroalkyl substances (PFAS) are a group of thousands of human-made chemicals that are used as surfactants, lubricants, and repellents for dirt, water, and grease in a wide range of products. PFAS do not break down easily. For this reason, they stay in the environment for a long time. People are exposed to PFAS in consumer products such as cosmetics, cookware, food packaging, furniture, and clothing, as well as in food, outdoor and indoor air, and house dust.

Regional Context Statement is the linking document under BC's Local Government Act that demonstrates the relationship between an **Official Community Plan** and the Regional Growth Strategy (Metro 2050) and, if applicable, how the Official Community Plan is to be made consistent with the regional growth strategy over time.

Stormwater Interagency Liaison Group is mandated within the Liquid Waste Management Plan to advise and work through technical stormwater issues with Metro Vancouver member jurisdictions and other government agencies.

System optimization refers to the approach of optimizing the available capacity of the combined sewer system during wet weather through operational adjustments that minimize the sanitary sewage loading in combined sewer overflows as well as minimizing overall combined sewer overflow volumes.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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

Integrated Liquid Waste and Resource Management Plan - Review and

~~Member Jurisdictions~~ Public Feedback / Response Table - Phase 2

ID	Source/ Material	Date	Comment/Information Request	Action/Commitment
1	Technical Workshop #1	Jul 6, 2022	Comment: It's important to look at the way in which different Metro Vancouver members might look at and value water quality differently, and monitor that differently. There might be a big value in creating a common baseline of comparability and transparency across jurisdictions. There is a worry that we are defaulting to the lowest common denominator in some of the baselines that are being generated.	The Adaptive Management Framework (AMF) developed by Metro Vancouver and members provides a common baseline to work from, while allowing for alternative plans through locally developed Integrated Watershed Management Plans, where unique conditions exist. The AMF also requires additional investigation when poor water quality results are found. Proposed actions 10.2, 11.3 further support this feedback.
2	Technical Workshop #1	Jul 6, 2022	Comment: Hazard identification — when the Sumas Prairies flooded in Nov/Dec 2021, the waters rose over industrial lands, car lots, farms, wastewater treatment plants, and nobody knew what the cascade of environmental impacts in terms of water quality back into fish habitat would be. In terms of hazard identification, what occurs to me is what happens before the flood, before the overflow? Hazard identification could include a combination of pre-existing baseline monitoring — so assess the impact after the incident — but also identifying known hazards that have not yet impacted on water quality but could be a risk (e.g. Fukushima, a well-run nuclear plant in Japan that was impacted by a seismic event that triggered a dramatic effect). If we are looking at climate change and foreseeable catastrophes, there could be vulnerable infrastructure of some parties — industry perhaps — that could have huge risk to municipalities and the waters they oversee downstream.	Municipal land use designations should take into consideration the risks associated with industrial operations in the industrial zones. With respect to discharges to the receiving waterbodies, the Province provides provincial discharge permits, and risks associated with catastrophic events are considered prior to issuing permits. Proposed action 12.1 can support this feedback, as the updated regional interagency group can explore this further.
3	Technical Workshop #1	Jul 6, 2022	Comment: It might be worth refreshing on the high level goal of the LWMP to protect public health and the environment and what is meant by the term "environment". I think largely many of the members here would be thinking fish habitat is generally a Department of Fisheries and Oceans (DFO)/federal responsibility with some provincial elements. I do worry that representation from the federal government is not here, or at the Stormwater Interagency Liaison Group. I worry about that because I know that DFO is largely saying that point source discharges when it comes to fish is the responsibility of Environment and Climate Change Canada (ECCC), and they say, we don't do commercial fish or salmon or whales. All of this is a reminder, when I look at the high-level goals of the LWMP, that there is a regulatory backdrop to it, both federally and provincially, which is a key element. In addition to that, we have Section 36 of the Fisheries Act, so if there are point source discharges that lead to a fish kill, there is real potential for federal enforcement. That's where we look to lead these investments, to advance the leadership on this file and ensure fish habitat is protected — to reduce liability of federal enforcement measures. Another thing to flag is the Species At Risk Act which has a lot of the teeth around fish habitat. There is critical killer whale habitat right off Annacis Island and Iona Wastewater Treatment Plants. And the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is proposing to list multiple salmon stocks and species for the Fraser Valley, and I suggest we will see increased federal concern in coming years on fish-bearing waterways. Metro Vancouver should anticipate that salmon will be increasingly under a regulatory lens; the Lower Fraser has lost about 80 per cent of its salmon habitat. So I put that out there as a thought to provide another piece of ammunition or aspirational tool where Metro Vancouver can anticipate this and work to address it proactively. This is about real-world operational issues with about a half-million chemicals on the production marketplace in Canada, and a series of regulatory and legislative backdrops, which can have the potential for future liabilities that this group of communities wants to avoid. Let's put it to your leadership, grounded in the potential of enforcement due to discharges, accidents, point source priorities, etc.	Proposed action 4.1 supports this feedback.

4	Technical Workshop #1 (Public Advisory Committee Written Feedback)	Aug 8, 2022	I was unable to attend the Wet Weather Wastewater Management Workshop, but have read the discussion materials. I realize we're not "at" Green Infrastructure yet – and at the same time I think we can't discuss the other issues without referring to what should IMO come first: stashing as much water as possible in landscapes, as our top priority! Assuming existing sewer capacity (i.e., while awaiting sewer separation), the only way to reduce combined sewer overflows in wet weather is to reduce the amount and/or speed of stormwater runoff entering those combined sewers. Grey infrastructure such as detention tanks can no doubt play a role, but these are a feedback loop into climate change – in that they require significant energy inputs in their construction and operation, yet they do not "pay back" in the form of CO2 uptake or cooling evapotranspiration. Tree canopy cover and stormwater infiltration are cheap, fast, climate-mitigating methods for reducing the amount and speed of stormwater runoff entering sewers. Combining these two methods – that is, diverting stormwater runoff into existing and newly-planted trees – produces larger and denser tree canopies, faster and more effectively, than the other climate-change feedback loop we see everywhere: treegator bags that must be repeatedly filled by staff operating energy-intensive tanker trucks! The first illustration below gives an idea of the effectiveness of tree cover (forested landscapes have essentially zero runoff). The second shows just one example of many here in North Delta, of a tree thriving far more than its neighbours of the same species (Zelkova), because it has tapped into an abundant water supply: parking lot runoff piped into a rain garden. On the hottest day, it's deliciously cool under that Zelkova – and baking hot under the wimpy canopies of the neighbouring Zelkovas that can't tap into the rain garden. Having seen trees thrive like this, I now realize that many of our street trees are actually stunted. They can't grow to their full potential because they're water-deprived – and meanwhile, street runoff is wasted down storm sewers where it contributes to CSOs!	Under the updated LWMP, Metro Vancouver and member jurisdictions are expanding the use of green infrastructure to reduce runoff and discharge, improve water quality and increase climate resilience. Proposed actions: 10.5 and 11.4

5	Technical Workshop #1 (Public Advisory Committee Written Feedback)	Aug 8, 2022	Green Infrastructure as an afterthought As I see it, we're still at a stage where Green Infrastructure is a performative afterthought, rather than the first thing we consider. Land costs are a nice excuse for this, but really, "where there's a will there's a way." It's more a matter of habit (easier and faster to do what we've long been doing) and of development standards and regulations that are locking us into future water woes (flood and drought), rather than encouraging us to address these woes creatively -- by using stormwater runoff as the valuable resource it is, instead of piping it away. An example of outmoded habits/regulations: "Thou shalt not allow water to drain from the roof of a private property to an adjacent public boulevard" – even if the trees on that boulevard would benefit greatly from the additional water. Or: "We're replacing all our ditches with storm sewers [even on quiet streets]" – never mind that the shallowest of ditches has better stormwater capacity than a pipe, slows the water down, infiltrates some of it, and provides the co-benefits of green space and habitat that no pipe can offer. Green Infrastructure as the first thought Where are the worst or most frequent CSOs in Metro Vancouver? How about the LWMP include a pilot or demonstration project in the catchment area of one of these worst cases? The project would involve looking for every opportunity for tree planting and rainwater infiltration to reduce wet-weather wastewater volume: on private property or public, business or residential, retrofit or redevelopment, on every type of space from roofs to planter boxes to perimeter landscaping to boulevards to enhanced ditches or swales to parks. "Peel off" as much water as possible into GI first, then see what remains for pipes to manage. A pilot or demo is an opportunity to (a) engage local residents, (b) encourage collaboration among local government departments (e.g. parks, planning and engineering) and (c) break a few counter-productive rules.	Under the updated LWMP, Metro Vancouver, in coordination with municipal members, will seek to update the Master Municipal Construction Documents (MMCDs) such that green infrastructure guidelines become standards, which should help support the effective expansion of green infrastructure across the region. We will also be working to harmonize and update rainwater policies, programs, and bylaws across member jurisdictions. LWMP Biennial Reports (https://metrovancouver.org/services/liquid-waste/reports-and-resources) provide the locations of the most frequent combined sewer overflows (CSOs). As for including a green infrastructure project in a specific catchment, member municipalities have been incorporating green infrastructure into catchments for many years, and will continue to do so, supported by the proposed actions in the updated LWMP. Grey infrastructure will still be required when rainfall intensities exceed the capacity of green infrastructure, thus acting complementary to each other. Proposed actions: 9.6, 10.4, 10.5, 11.2 11.4, 12.3

6	Technical Workshop #1 (Written Feedback)	Aug 8, 2022	I & I Incentives? Wet-weather fees? Certified versus uncertified laterals? Inspections? I must confess it all sounds quite complex and costly, with no guarantee that it would translate into a "better" cityscape. At the level of individual residents and businesses, I imagine them cursing bureaucracy as they pay up whatever they need to pay! Whereas what we really need is for people to understand the big picture and embrace some climate-friendly solutions on their own properties …. I'd rather see sliding scale stormwater fees charged in inverse proportion to a property's percentage of tree canopy cover. This would encourage tree planting and retention. Also, it's pretty easy to explain to the public: trees reduce the volume and speed of stormwater runoff, thereby reducing the need to dig up streets to put in larger pipes (= costly taxpayer-funded work). Most people also get that we need trees for climate mitigation, so we've got a double-benefit here. Quote from a building inspector Snooping on the web about basement flooding, I found this: https://www.deckerhomeservices.com/basement_flooding/ How to avoid [basement] flooding:. Make sure that your roof's gutters and downspouts are in good condition, free of leaves and debris, that they drain at least 6' away from the house (12' is better) and that they drain down slope from the house. They SHOULD NOT drain into the municipal sewer system, this would only increase the amount of water backflowing into your basement. The grade around your house should, ideally, slope away from the house at a rate of 1" down for each 12" away. This is a quick, easy and inexpensive solution. If rain water is drained away from the house, it will not come back into the basement. If this water is percolated back into the soil, it will not backup into the sewer system.	A number of proposed actions in the updated LWMP address inflow and infiltration, which is extra rainwater entering the system from leaky or improperly connected private side pipes. See proposed actions under Strategy 5, in particular 5.4 and 5.5, as well as 6.4.
7	Technical Workshop #1 (Public Advisory Committee Written Feedback)	Aug 8, 2022	Added downspout sections cost as little as $4.95 for a 10' section. Avoid the cheap plastic add-on extensions and buy the metal ones, they last longer and do not leak. Downspout additions should also be secured with sheet metal screws and your landscaping company should be warned to not remove or physically damage them. This is a very simple, but the most overlooked solution, in my experience. This was exactly my experience at an old church on Prince Albert and E. 19th, where I helped the youth group create a rain garden in fall 2021. Before we were ready to divert 3 roof downspouts into the new garden, heavy rains in late September caused a basement flood; probably the old lateral had been overwhelmed. City of Vancouver came and reamed things out, so perhaps their pipe was involved too? We did the downspout disconnect and diversion on October 3. There was no further water ingress into the basement -- despite the torrential "atmospheric river" rains in November – and there have been no problems ever since.	The following proposed actions support this feedback: 5.1, 5.2, 5.5
8	Rotary Club of Yaletown Meeting	Nov 10, 2022	Asked about the pipes on private property, how can she know where and where not to plant, so as not to compromise them	Municipalties have a record of the location of pipes on private property. In many cases, those records are available on a municipality's website.
9	Rotary Club of Yaletown Meeting	Nov 10, 2022	Asked if golf courses were a significant source of water pollution in the region	While it would depend on the golf course, the chemicals they use, and their landscaping practices, properly sited Adaptive Management Framework sampling should identify issues, and would trigger further testing and investigation. Green infrastructure installations could help address this as well. Proposed actions 10.2, 10.5 support this feedback.
10	Rotary Club of Yaletown Meeting	Nov 10, 2022	Asked if MV sells biosolids to the public.	Yes, Metro Vancouver sells Nutrifor to the public. See website: https://metrovancouver.org/services/liquid-waste/biosolids/get-nutrifor

11	Rotary Club of Yaletown Meeting	Nov 10, 2022	Asked about reduce/reuse/recycle when it comes to wastewater.	Metro Vancouver's wastewater treatment plants already use treated effluent onsite for non-potable processes. We're working on ways to increase the use of treated wastewater in the region. Treated wastewater can be further treated to higher standards for use as reclaimed water. This includes outdoor and industrial uses such as sewer flushing, street sweeping, hydrovac excavation, landscape watering, and street-tree watering. Using reclaimed water helps conserve drinking water. Reclaimed water facilities with truck fill stations are being planned at the new North Shore, Northwest Langley, and Iona Island wastewater treatment plants. Proposed actions 16.2, 16.3, 16.4 further support this feedback.
12	Rotary Club of Yaletown Meeting	Nov 10, 2022	Asked if MV had considered generating electricity through generators installed in pipes/water flow.	Yes, Metro Vancouver has looked into electricity generation from both wastewater and potable water flow. The business case is not positive for wastewater. However, several proposed actions in the updated LWMP address the recovery of energy and resources from wastewater, including: 16.1, 16.2, 16.3, 16.4.
13	Rotary Club of Yaletown Meeting	Nov 10, 2022	Noted that industry is one of the largest users of potable water, why can't we change that.	Data shows us that drinking water use in the region is around 75 per cent residential and 25 per cent commercial/industrial. The ways that different users can conserve water may differ; however, there are water conservation opportunities available for all sectors. Proposed actions that support this feedback include: 3.3, 3.5c.
14	Rotary Club of Yaletown Meeting	Nov 10, 2022	Asked why potable water is used in toilets, and not non-potable.	Increasing use of non-potable water for toilets has been encouraged, however, durng the longer summer drought periods our area is experiencing, potable water is still required for flushing. There are really no options in homes unless the homeowner completely re-does their plumbing system, which is financially onerous. There are more opportunities to make changes during re-development and for larger buildings. See Metro Vancouver produced guidebook promoting non-potable systems. https://metrovancouver.org/services/water/Documents/non-potable-water-systems-printer-friendly-guidebook-2022.pdf Proposed action: 3.5 further supports this feedback.
15	Rotary Club of Yaletown Meeting	Nov 10, 2022	Asked if building codes can change.	Building codes tend to be developed to be risk adverse to prevent flooding, e.g. the leaky condos issues in the 90s which resulted in hundreds of millions of dollars in damages from water getting into buildings. They are managed at the national and provincial levels, and they take time to change. However, proposed action 11.4 seeks to update the Master Municipal Construction Documents so that green infrastructure guidelines become standards.

16	Email	Aug 3, 2023	As public input on the Metro Vancouver Integrated Liquid Waste and Resource Management Plan, I would like to introduce you to two local clean tech companies: • Eagleridge Innovations Corporation (West Vancouver), and • Muddy River Technologies Ltd. (Delta). Together we have locally developed technologies that promise to transform the waste water treatment industry by converting waste activated sludge (WAS) into resources, more simply and at lower cost than other technologies. These technologies serve to "help the protection of human health and the environment, while using wastewater as a resource and minimizing treatment costs" – words from the Metro Vancouver "Have Your Say" notice in the Vancouver Sun. The MicroPoP technology completely eliminates waste activated sludge (WAS) with up to 2X biogas produced from the digested WAS, as well as enabling complete recovery of phosphorus and nitrogen as fertilizers with tech module add-ons. Used synergistically, the technologies fully extract these resources from the waste activated sludge with none left over, at less cost than currently used technologies. These 3 technologies are TRL 6-7 and we are seeking collaboration on a technology demonstration project to showcase the technologies utilizing full scale machinery in inventory. This significantly decreases the cost of a demonstration project with a shorter timeline to operations and achieved savings. Savings that may exceed the demo project costs in the first year. We are gaining recognition in Canada and elsewhere: • NGIF (Canadian Natural Gas Innovation Fund) Clean Tech Challenge - advanced to Stage 2 finalist. NGIF is funded by a consortium of natural gas companies in Canada (including FortisBC), • LACI, Los Angeles CleanTech Incubator - finalist. LACI fits well with Los Angeles County Sanitation District (LACSD), who we are also in contact with. • UK Water Dragons competition finalist. Also in contact with Thames Water, the largest UK waste water treatment utility, and universities in Portsmouth and Southampton. • Several EU countries - continuing discussions for possible demo projects. See brief intro below on the MicroPoP technology. We would be happy to provide a technology presentation if you are interested. Kind Regards, Erik EAGLERIDGE INNOVATIONS www.eagleridgeinnovation.com/ Contact: Erik Rehtlane, President and CEO MicroPoP eliminates waste activated sludge with up to 2X biogas Eagleridge's MicroPoP technology, together with new add-on modules for nutrient level control, solves large issues at wastewater treatment plants: 1. Waste Activated Sludge (WAS) solids management - MicroPoP liquefies the WAS solids using upgraded high pressure homogenization machinery allowing for complete elimination of WAS with up to 2X biogas from WAS digestion,	Thank you for this information regarding your technology.

			2. ”MagPi” add-on for Phosphorus recovery as struvite fertilizer (using electro- chemistry to dissolve magnesium ions that lead to struvite precipitation) , and 3. ”Misty” add-on for Nitrogen recovery as ammonium sulphate fertilizer (using gas pressure/pH criteria for stripping and scrubbing). MicroPoP breaks apart (lyses) all of the bacteria in the WAS making a readily available food source for the bacteria back in the process, whether aerobic or anaerobic. The bacteria can quickly metabolize this liquefied WAS. Nutrients that were inside the WAS microbes are also released and are recovered as useable fertilizer. This simple and sustainable technology has large cost savings, minimizes biosolids handling and disposal, reduces GHGs, and increases biogas production for RNG or CHP projects, amongst other positives. As the WAS is eliminated, no polymers are required for WAS dewatering, nor are there any further WAS handling and disposal costs. MicroPoP eliminates the difficult WAS waste stream while lessening environmental impacts. The MicroPoP/MagPi and Misty technologies promise to change the waste water treatment industry with 100% biogas potential recovered from waste activated sludge with zero residues, and with full phosphorus and nitrogen resource recovery. • There is no other solution as complete. • This is nothing simpler • There is nothing that requires as small of a footprint • There is nothing less expensive, nor with as many benefits Please contact me with questions and/or comments. Looking forward to hearing from you soon. Erik Rehtlane B.A.Sc. CEO and President Eagleridge Innovations Corporation erikr@eagleridgeinnovation.com www.eagleridgeinnovation.com	
17	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: As with everything around societal awareness, start with kids. They bring things home to their parents and ask why parents aren’t doing a particular behavior. But kids aren’t making the decisions in the home, so you also need to go beyond the education system to the parents as well.	Proposed action 5.1 supports this feedback.
18	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: People always take action when money is on the line – give them incentives, actions they can take to save money.	The following proposed actions support this feedback: 5.1, 5.4.
19	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: If you’re educating parents – focus on safety of kids, their home, etc. and overall cost. If you tell them about the risk of flooding being more than cost of hiring a plumber to camera their pipes once every ten years, they may act.	Proposed action 5.1 supports this feedback.
20	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: Simplified language is important. Sewage in our waterways is bad, stormwater in our sanitary is bad.	Proposed action 5.1 supports this feedback.

21	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Action: Do people have to look at plans for their house when they buy it? Do people even know what state their pipes are in when they buy the house?	The following proposed actions support this feedback about pipe inspections: 5.3, 5.5.
22	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Action: If you're buying a place is there a way to require the inspection of private pipes at that time?	While the updated LWMP does not at this time include an action requiring the inspection of pipes at the time of sale, proposed action 5.2 supports members to require inspection when construction or redevelopment occurs. Proposed action 5.3 further supports members to conduct inspection of private lateral pipes in priority arears.
23	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: What about general education for landlords. They are responsible for many residences.	Metro Vancouver has existing resources to help residents address inflow and infiltration on private property: https://metrovancouver.org/services/liquid-waste/Documents/homeowners-guide-stormwater-management.pdf Proposed action 5.1 also supports this feedback.
24	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Action: Can you require the landlords to check the pipes, and business owners, if not homeowners?	Proposed action 5.3 supports this feedback about approaches to private property pipe inspections.
25	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Need education across a broad spectrum of adults. We are seeing densification across a broad scale, tiny apartments or single family homes. The property density increase will see all kinds of demographics that need to be reached.	Metro Vancouver has existing resources to help residents address inflow and infiltration on private property: https://metrovancouver.org/services/liquid-waste/Documents/homeowners-guide-stormwater-management.pdf Proposed action 5.1 also supports this feedback.
26	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	Action: *Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Action: You could target neighbourhoods or communities based on age. Send out a flyer explaining the issue, highlighting the potential for issues with the age of the infrastructure in the area and explaining how people can take action.	The following proposed actions support this feedback: 5.1, 5.3, 5.4, 6.1.
27	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: Make the emphasis on personal impact and benefits. Recycling has a lot of commercials, where is inflow and infiltration?	Metro Vancouver has existing resources to help residents address inflow and infiltration on private property: https://metrovancouver.org/services/liquid-waste/Documents/homeowners-guide-stormwater-management.pdf Proposed action 5.1 also supports this feedback, by expanding messaging in our education iniatives to demonstrate the relationship between inflow and infiltration and efficient liquid waste management, showing that investing in water-tight private laterals is an effective strategy that can reduce regional infrastructure costs and help protect the environment.
28	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: What about an education campaign/fact sheet focused on diagrams of pipes, letting people really know what is underneath their properties and what is happening. People just don't know and it's out of sight out of mind.	Metro Vancouver has an overview and videos about the wastewater sytem here: https://metrovancouver.org/services/liquid-waste/metro-vancouvers-wastewater-system Proposed action 5.1 also supports this feedback.
29	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: People don't care about pipes, they do care about health of kids swimming in water, cost of flooding in their homes, etc.	Proposed action 5.1 supports this feedback.

30	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: Expand advertising efforts to raise awareness of issue (high visibility of MV advertising encouraging not putting grease down drain, but low visibility of ads encouraging checking pipes for I&I issues).	Proposed action 5.1 supports this feedback.
31	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: Promote awareness of who should be checking their pipes, and provide guidelines	Proposed action 5.1 supports this feedback.
32	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Need to acknowledge that many people aren't homeowners – they're renting, or property is owned by those outside of region. Need to find a way to make owners aware and willing to take action.	Proposed actions to address inflow and infiltration will involve working with property ownersm whether single-family home owners or multi-family building owners. Proposed actions under Strategy 5 support this feedback.
33	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: Provide pipe cameras to libraries to loan to residents, and promote this option.	Pipe cameras are available to rent for residents to inspect their sewer laterals. Professional plumbers will also typically have this equipment and can inspect sewer laterals for a fee.
34	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Provide education localized to specific areas, to help people learn more about their own "backyards" and to make the message resonate (e.g., the stormwater overflows go to this specific creek). Discussion about how the fish symbol on stormwater drains is very effective and could potentially be leveraged/extended.	Proposed action 5.1 supports this feedback.
35	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Provide education and awareness of what responsibilities fall on homeowners and what are municipal/regional responsibilities.	Proposed action 5.1 supports this feedback.
36	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Raise awareness amongst businesses (e.g., restaurants) about what should go down drains, and make it an obligation for them to check/fix pipes.	Targeted education initiatives to businesses on the disposal of fats, oils, grease is something Metro Vancouver does, as is enforcement of the region's *Sewer Use Bylaw*. The following proposed actions also support this feedback: 3.2, 3.4, 5.1.
37	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Provide education on that what gets thrown out in the street ends up in the ocean.	Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education campaigns over time. Proposed action 4.2 supports this feedback.
38	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Provide incentives for checking pipes. While incentives often benefit those who would be taking action anyway, in this case I&I is such a hidden issue that incentives would raise awareness and encourage people to take action.	Proposed action 5.4 supports this feedback.

39	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Penalties not supported, as cost of housing is already so expensive. This would be an excessive step.	Under the updated LWMP, Metro Vancouver and members will be exploring incentive or funding programs to help support residents to take action on private-side inflow and infiltration. Proposed action 5.4 supports this feedback.
40	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Combine incentives for green infrastructure and stormwater management on private property.	Metro Vancouver offers guidance to homeowners about green infrastructure and stormwater management on private property here: https://metrovancouver.org/services/liquid-waste/managing-stormwater-in-your-yard Incentive programs would likely be a municipal responsibility; however, a number of proposed actions in the LWMP aim to support the expansion of green infrastructure in the region, under Strategies 10, 11, 12.
41	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Provide cost sharing options, where homeowners pay part of the cost and MV pays part because it's to the region's benefit.	Under the updated LWMP, Metro Vancouver and members will be exploring incentive or funding programs to help support residents to take action on private side inflow and infiltration. Proposed action 5.4 supports this feedback.
42	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Impose regulations on long-term lease agreements, making routine inspections a condition of lease (primarily for businesses).	While the updated LWMP does not at this time include an action requiring the inspection of pipes at the time of lease, proposed action 5.3 supports members to take action on private property pipe inspections.
43	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Require in building code that new developments adequately plan for on-site stormwater management	An approach such as this is currently administered by municipalities, mostly on an as needed basis. Proposed actions 11.2, 12.1 could support this type of approach.
44	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Require that strata councils regularly inspect pipes	Proposed action 5.3 supports this feedback.
45	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Infrastructure is often "strung together" quickly in order to support development, and more diligence is needed on the quality of infrastructure that gets built. The transition in quality of private vs public infrastructure is often quite noticeable, and more could be done to regulate private build out of infrastructure, as 50% of pipes are on private property.	The following proposed actions support this feedback: 5.2, 5.3, 5.4, 5.5.
46	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	Comment: MV needs to provide support/push members to take action on aging/inadequate infrastructure.	A key focus for the updated LWMP will be maintaining and improving the condition and performance of the sewerage systems to serve a growing population in a changing climate. Proposed actions support this feedback: 1.1, 5.2, 5.3, 5.4, 9.1, 9.3, 9.4, 14.2.
47	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Important for MV and members to demonstrate the action they are taking, to reduce perception that responsibility is being downloaded to residents.	As part of proposed action 5.1 to conduct public education and outreach on the relationship between inflow and infiltration and efficient liquid waste management, showing that investing in water-tight private laterals is an effective demand side management strategy that can reduce regional infrastructure costs, Metro Vancouver and members could highlight the work they are doing to reduce inflow and infiltration in regional and municipal pipes.

49	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Doing a routine inspection program for pipes at houses	Proposed action 5.3 supports this feedback.
50	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: Locations of pipes on maps	Metro Vancouver offers a GIS map of the regional wastewater system here: https://metrovancouver.org/services/liquid-waste/gis-map-regional-wastewater-system. Most municipalities provide on-line access to maps of the public sewer sewer system. The location of private side pipes may also be available in municipal building department records.
52	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Pipes are underground so education piece is important	Metro Vancouver understands the challenge of making people aware of the importance of the wastewater system when it is out of sight and underground. Metro Vancouver already has several public education campaigns about the region's wastewater system (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes and https://metrovancouver.org/services/liquid-waste/campaign-materials), and the updated LWMP aims to continue to educate on the wastewater system through several proposed actions in the LWMP. Proposed actions 3.1, 4.2, and 5.1 support this feedback.
53	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Question: How can we make the topics interesting to high school students?	Metro Vancouver supports teachers and youth with resources and experiential learning opportunities to connect to local sustainability topics such as wastewater management, climate change, and ecological health. We will continue to make outreach to youth a key component of our public education campaigns. Proposed action 4.2a further supports this feedback.
54	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Climate change is one factor	A key focus for Metro Vancouver, as well as the updated LWMP, is planning for and responding to the impacts of climate change. See for example proposed actions 1.1, 2.2, 2.3.
55	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: Emotional connection of salmon and other fish and impacts to them from wastewater	Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education campaigns over time.
56	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: First time homeowners fund tied to education and/or private sewer inspection program	While the updated LWMP does not at this time include an action requiring the inspection of pipes at the time of sale, first time or otherwise, proposed action 5.3 supports members to take action on private property pipe inspections, and proposed action 5.1 will aim to educate home owners, including first time ones, about the importance of water-tight private side pipes.
57	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Question: Are stratas expected to inspect their pipes?	At this time, there are no mandatory rules for stratas to inspect their pipes under municipal bylaws. Proposed action 5.2 supports inspection at the time of consruction or redevelopment, while proposed action 5.3 supports inspection of existing properties in priority areas.
58	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Noted homeowners have more control as opposed to condos and apartments	Proposed actions to address inflow and infiltration will involve working with property ownersm whether single-family home owners or multi-family building owners. Proposed actions under Strategy 5 support this feedback.

59	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Connecting age of building and requiring inspections	Proposed action 5.3 focuses on determining which areas have the highest inflow and infilration and prioritizing those areas for inspection and action.
60	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Noted about Coquitlam's grant program	Proposed action 5.4 supports this feedback (i.e. exploring funding and incentive programs).
61	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Noted it can be expensive to fix pipes	Proposed action 5.4 supports this feedback.
62	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Consequences of overflows and connecting to individuals	Proposed action 5.1 supports this feedback.
63	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Comment: Group has not heard about this topic before	Proposed action 5.1 will aim to advance public education on the issue of inflow and infiltration.
65	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: Promote importance of protecting waterways at the source, potentially via a campaign that shows consequences – people tend to act when they know something is going wrong. Raise awareness via prioritization of roles (e.g., flyers in older neighbourhoods with higher risk of damaged pipes).	Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 and 5.1 support this feedback.
66	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: Give more consideration of what municipalities can regulate (e.g., setting requirements to inspect pipes as condition of new developments and lease agreements, and require consideration of I&I issues in new construction).	Proposed actions 5.2, 5.3, 5.5 support this feedback.
67	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: Provide incentives or cost-sharing opportunities because I&I, stormwater issues are rarely thought about. Incentives could be a powerful tool, until these issues become part of broader public discourse.	Proposed action 5.4 supports this feedback.
68	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Suggestion: Leverage emotions to raise awareness/action, by making people care about where their water goes. Comment that the Stream of Dreams program is a powerful tool for making people emotionally attached to where their wastewater goes, costs, and connection to everyday lives.	Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Metro Vancouver has worked with Stream of Dreams to offer programming to schools across the region. Proposed actions 3.1, 4.2 and 5.1 support this feedback.

69	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Question: What ideas do you have to encourage awareness and action by residents (including property owners and others) to address inflow and infiltration?* Question: Are there enough qualified individuals to perform pipe checks if this was incentivized or made mandatory	Yes, most plumbing contractors are now equipped to do pipe inspections.
70	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Link source control to places where people recreate and spend time	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
71	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Frame it as a duty to your community. People feel like their actions are inconsequential. Show that everyone can make a difference by acting.	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
72	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Question: Is there a way munis can communicate the impact of poor choices? You need data/metrics to show the impact of people's actions. E.g. find a way to show the negative impacts of the pollution from homes and businesses.	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
73	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: If you can find the data, gear things to particular sectors.	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Targeted engagement to various sectors is also a focus of our education efforts. Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
74	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Gear education towards your audience, some will care about the ocean, some won't	Metro Vancouver has several public education initiatives and campaigns encouraging source control, with different messaging (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Targeted engagement to various sectors is also a focus of our education efforts. Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
75	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Note that people on septic and wellwater are very aware of what they put into their toilets and the quality of their drinking water in wells – because they know their actions matter to their wellbeing.	We know residents in our region care about protecting the environment and our water resources. Our public education campaigns serve to remind residents about what they can do to make a positive impact and we strive more people to be stewards of our natural environment. https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes
76	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Question: If you were to monitor the wastewater of each household, be more cognizant of the wastewater you're producing, people would be more inclined to care. What about wastewater monitoring and penalties for too much, or poor quality wastewater?	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback. In addition, proposed action 3.5 aims to advance metering and conservation of drinking water, which becomes wastewater after it goes down the drain or toilet.

77	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control? Comment: Need to find how to make doing the right thing easier.	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
78	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	Discussion Questions: *What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Make it more clear what shouldn't go down the drain. Mandate wipes, feminine products, medicines, chemicals to print clearly "don't flush" on packaging	Metro Vancouver does not have the jurisdiction to regulate labelling on consumer products. We continue to advocate and push for provincial and federal governemnts to create more stringent labelling and production requirements to address issues with unflushable items. Proposed actions 3.1, 4.1, and 4.2 further support this feedback.
79	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Put posters on bathroom doors, including in MV spaces. Captive audience for education on source control – at the source.	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
80	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Important to raise awareness of where people's water goes after it leave their home. Maps can be a helpful tool.	Metro Vancouver has resources that show how the wastewater system works, for example https://metrovancouver.org/services/liquid-waste/metro-vancouvers-wastewater-system. We will continue to consider ways to include ideas like this as we work to continuously improve our public education initiatives and campaigns over time.
81	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: We all want to connect with people's environmental values, but be wary of message fatigue. All these messages pile up throughout the day until they're difficult to distinguish or prioritize.	This is true, and something Metro Vancouver considers when developing public education initiatives and campaigns. (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes).
82	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: We know that we want to do better for the environment, but so much messaging is thrown around and it is often difficult to see the results. Therefore it's important to show successes, rather than just the problem.	Proposed actions 11.3, 12.4 support this feedback.
83	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Potential messaging: We spend so much money on these problem, but we could be spending it on these beneficial things (e.g., park space).	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 11.3 further support this feedback.
85	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Important to teach people from a young age about these issues, before patterns are set.	Metro Vancouver supports teachers and youth with resources and experiential learning opportunities to connect to local sustainability topics such as wastewater management, climate change, and ecological health. We will continue to make outreach to youth a key component of our public education initiatives and campaigns. Proposed action 4.2a further supports this feedback.

86	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: People often don't have the time or energy to educate themselves – it's important to make content very accessible and straightforward. These are easy actions (what to flush) compared to how to sort waste.	Metro Vancouver's education initiatives and campaigns aim to provide accessible and straightforward messaging. The Unflushables campaign reminds people that the only things that are okay to flush down the toilet are the 3 P's: pee, poo and toilet paper (https://metrovancouver.org/services/liquid-waste/the-unflushables). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
87	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Show how actions will have a personal benefit (e.g., don't flush tampons because you're going to flood your own home).	Metro Vancouver has several public education campaigns encouraging source control https://metrovancouver.org/services/liquid-waste/campaign-materials). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
88	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Provide behaviour change marketing at the source (e.g., ads educating about how wipes don't flush in the wipes aisle: "these aren't flushable in the local system").	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
89	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Hold competitions or contests for youth to gamify the education – also an opportunity to connect with family members of different ages who would be celebrating contestants.	Metro Vancouver supports teachers and youth with resources and experiential learning opportunities to connect to local sustainability topics such as wastewater management, climate change, and ecological health. We will continue to make outreach to youth a key component of our public education initiatives and campaigns. Proposed action 4.2a further supports this feedback.
90	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Showing marine life (e.g., the sea otter) is motivating.	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
92	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Use humour in communications campaign - informative but not serious	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
93	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Behaviour campaigns are enjoyable and have a positive spin	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
95	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Showing people where the overflows end up (e.g. which waterways)	Metro Vancouver maintains the Real-time Sewer Overflow Map that displays points of overflow into local waterways here: https://metrovancouver.org/services/liquid-waste/real-time-sewer-overflow-map
96	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Helping people understand their house is part of the watershed - visualizing the big picture	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.

97	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: Digital map that shows their houses and closest body of water	Metro Vancouver offers a GIS map of the regional wastewater system here: https://metrovancouver.org/services/liquid-waste/gis-map-regional-wastewater-system
98	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Response: Showing visuals of what the risk and harms are	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
99	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Comment: The impacts of the substances we use are not easily understood and would be great to get the message of impacts out somehow	Metro Vancouver has multiple public education campaigns encouraging source control, and showing the risks and harms of pollutants (https://metrovancouver.org/services/liquid-waste/preventing-problems-in-your-pipes). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
100	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Suggestion: Find ways to make information more accessible in public spaces (e.g., information on what to flush in washrooms).	Metro Vancouver's Unflushables campaign has included messaging in public washrooms about wipes (https://metrovancouver.org/services/liquid-waste/the-unflushables). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
101	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Suggestion: Increase general awareness – routines like flushing wipes can be broken by education at the source (e.g., washroom advertising about wipes)	Metro Vancouver's Unflushables campaign has included messaging in public washrooms about wipes (https://metrovancouver.org/services/liquid-waste/the-unflushables). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
102	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	*Discussion Questions: What are the values that people would connect with to rethink using their toilet or catch basin to dispose of harmful substances? How can we further influence residents to practice source control?* Suggestion: Attempt to focus communications campaigns on solutions and what should be done, rather than mistakes people are making or negative actions.	Metro Vancouver has multiple public education initiatives and campaigns that include messaging on the right thing to do (https://metrovancouver.org/services/liquid-waste/campaign-materials). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
103	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	Question: Is MV looking at wastewater reuse for the next LWMP? We are wasting our drinking water reservoirs instead of reusing wastewater wherever we can.	Metro Vancouver's wastewater treatment plants already use treated effluent onsite for non-potable processes. We're working on ways to increase the use of treated wastewater in the region. Treated wastewater can be further treated to higher standards for use as reclaimed water. This includes outdoor and industrial uses such as sewer flushing, street sweeping, hydrovac excavation, landscape watering and street-tree watering. Using reclaimed water helps conserve drinking water. Reclaimed water facilities with truck fill stations are being planned at the new North Shore, Northwest Langley, and Iona Island wastewater treatment plants. As for greywater reuse, Metro Vancouver supports the concept of greywater use as an important water conservation measure, and has published a Non-Potable Water Systems Guidebook to support greywater use in the region. Proposed actions 16.4, 17.2 further support this feedback.

104	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	Comment: Green infrastructure is so important – getting people to know that MV does it, and how they can do it at home. People don't really know what it is. It's attractive but also a stormwater and climate solution.	A key focus for stormwater management in the updated LWMP is support for the enhancement and expansion of green infrastructure in the region. Proposed actions 10.5 and 11.3 further support this feedback.
105	Metro Vancouver Youth and Education Advisory Panel Meeting Summary	Nov 21, 2023	Question: Could MV do a GI display and presentation at the PNE installation to educate the public?	Metro Vancouver could consider this suggestion for future PNE installations or other opportunities.
106	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	Notes: - Infiltration water = "USELESS WATER" - Infiltration water -> How to keep extra water out of sewers! - CCTV -> keeping track of potential leakage/issues - Green spaces on ROOFS!	Proposed actions under Strategies 5, 6, 7, and proposed action 10.5 address inflow and infiltration and green infrastructure.
107	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	Problems: - tree roots - poisonous materials - soil polution - leakage -> external + internal - ecosystem DMG - long showers - spikes of water usage - weakening pipes	Proposed actions under Strategy 3 and Strategy 4 address water conservation and reducing pollutants, supporting this feedback.
108	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	Solutions: - try to put treelings into pots - education - change pipe material + PROTECTION - stronger glue! - inspections (homes) - involvement of AI - More green infrastructure to absorb the water - use less water!	Proposed actions under Strategies 5, 6, 7, and proposed action 10.5 address inflow and infilration and green infrastructure.
109	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	*Discussion Question - Wastewater Treatment: What is your biggest takeaway from the wastewater treatment tour this morning? Has your perspective changed about our sewer system?* Biggest Takeaways: - surprised by the complexity of system - not as automated as expected - birds, wildlife - scum is a technical term - plants are not as warm as expected. - gas used to generate heat - pretty clean at WWTP's	Proposed actions under Strategy 13 and 14 address wastewater treatment in the updated LWMP.

110	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	*Discussion Question - Wastewater Treatment: What would make youth stop and rethink using their toilet, sink or storm drain to dispose of harmful substances?* What would make you stop & rethink what goes down the drain: - big examples to capture attention - better education in schools (Into curriculum) - make content more relatable - don't blame, use positive tone!	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/campaign-materials). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education initiatives and campaigns over time. Proposed actions 3.1, 4.2 further support this feedback.
111	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	*Discussion Question - Sewer Overflows: Is there a more clear term than "inflow and infiltration" that you think would catch people's attention?* - makes sense only w/ context - more visuals -> social media - insta reels - relate it to toilet overflows - relate it to cost of choices - emphasis on the outcome - eyecatching data - motor oil ripple effect inspo	Proposed action 5.1 aims to better educate the public about inflow and infiltation and can take these ideas into account when developing educational materials.
112	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	New Terms: - Rainclogging - Stormclogging - Stormwater backflow - Stormplugging	The LWMP will change terminology from Stormwater to Rainwater to emphasize that rain is a resource.
113	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	Leak: - rain ground - rain sewage overflow - pipeflooding	Proposed action 5.1 aims to better educate the public about inflow and infiltation and can take these ideas into account when developing educational materials.
114	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	*Discussion Question - Sewer Overflow: Can you think of steps we can take to keep extra water out of our sewers?* - more greenroofs/keeping rainwater "in use" -> green infrastructure - education: vidoes, instagram reels-> more attention to the problem - earth day education in SCHOOLS -> bring in experts/presenters - field trips?	Proposed actions 5.1 and 10.5 support this feedback.
115	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	*Discussion Question - Wastewater Treatment: What is your biggest takeaway from the wastewater treatment tour this morning? Has your perspective changed about our sewer system?* - Liquid Waste as a Resource - tour helps people be more educated about the process. - difficult & costs $$$ -> learned about the system as result - learned about primary & secondary treatment plants - career opportunities - people take city services for granted - grants to cover cost of checking + fixing pipes -> advertising these also raises awareness - "overcapacity" -> easier to understand - videos/gifs animations to explain issue	Proposed actions under Strategy 13 and 14 address wastewater treatment, while proposed actions under Strategy 15 and 16 address recovering resources from wastewater.

116	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	Inflow and Infiltration: - wet weather sewer overflows - too much water - is rain leaking into your pipes - broken pipes -> more water - overflow - is your home impacting the environment? - when was the last time you checked your pipes? - How does this impact everybody? - Your responsibility - Awareness, causes (visuals?) - negative	Proposed action 5.1 aims to better educate the public about inflow and infiltation and can take these ideas into account when developing educational materials.
117	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	How will we get this to spread out? (steps) - social media ads - trendy - start off with something discoverable - use for it - present other things as the problem - more videos/moving pictures - trends change often, keep up with these	Proposed action 5.1 supports this feedback.
118	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	*Discussion Question - Sewer Overflows: Is there a more clear term than "inflow and infiltration" that you think would catch people's attention?* Alternative to "Inflow + Infiltration" - gaps - leaks - seepage - dam-breaking	Proposed action 5.1 aims to better educate the public about inflow and infiltation and can take these ideas into account when developing educational materials.
119	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	*Discussion Question - Sewer Overflow: Can you think of steps we can take to keep extra water out of our sewers?* Steps to keep extra water out of the sewers -> fines - periodically inspect - financial penalty -> Permeable Pavement - absorbs the water - needs maintenance -> Limit root systems - trees + plant roots can damage pipes - hard to enforce limits on tree growth	Proposed actions 5.1, 5.4 (financial incentives rather than penalties in this case) and 5.5 support this feedback

120	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	*Discussion Question - Wastewater Treatment: What is your biggest takeaway from the wastewater treatment tour this morning? Has your perspective changed about our sewer system?* TAKEAWAYS - size of treatment plant - surroundings (lots of nature) --near ocean --near nature (bushes, trees, etc,) - complexity of treatment process - jobs (wages, hours) -- lots of career opportunities -- good pay - large "parts" that were relegated - effects of output on waterlife -- phosphorous, nitrogen can overstimulate algae -- chemicals can kill off fish and plants - combined vs separated sewers -- older properties have combined sewers -- city wants to change into separated - Plants are moving towards alternative uses for sewage/waste water -- water output/biomasss can be used as fertilizer -- produce energy	Proposed actions under Strategies 5 - 9 address sanitary and combined sewer overflows; proposed actions under Strategy 13 and 14 address wastewater treatment; proposed actions under Strategy 15 and 16 address recovering resources from wastewater.
121	Youth4Action March 19, 2024 Meeting Notes	Mar 19, 2024	*Discussion Question - Wastewater treatment: What would make youth stop and rethink using their toilet, sink or storm drain to dispose of harmful substances?* Ideas to reduce disposal of harmful chemicals (youth) - low flush/2 load toilets - education/awareness -> why it matters to them - education/awareness -> let them know the impact - hands on experience -> work in WWTP	Metro Vancouver has multiple public education initiatives and campaigns encouraging source control (https://metrovancouver.org/services/liquid-waste/campaign-materials). Metro Vancouver will consider these kinds of ideas as we work to continuously improve our public education campaigns over time. Proposed actions 3.1, 4.2 further support this feedback. Metro Vancouver also supports teachers and youth with resources and experiential learning opportunities to connect to local sustainability topics such as wastewater management, climate change, and ecological health. We will continue to make outreach to youth a key component of our public education initiatives and campaigns. Proposed action 4.2a) further supports this feedback.
122	Metro Vancouver Youth and Education Advisory Panel Meeting	Apr 30, 2024	*Discussion Question: It's 10 years from now. Looking at the goals we've set, and knowing the increasing impacts of climate change, population growth, demand for housing and resources … Is anything missing?* - How do we make more explicit connections to water plan -- Water-efficient appliances in homes - How will we measure for all - For all organisms! - on land + waters in the region	Proposed action 3.5 supports the advancement of water conservation.

123	Metro Vancouver Youth and Education Advisory Panel Meeting	Apr 30, 2024	*Discussion Question: How will we know when we've reached our goals? What would you use to measure achievement of these goals, from your perspective?* *Goal 4 - First Nations are actively involved in regional liquid waste management* FN <u>actively</u> involved -> Defining this -> Side-by-side decision-makers - Opinions sought but decision-made by other groups - Project led by Nation Metric - % of Nations in region involved	The LWMP seeks to honour the Board's commitment to reconciliation with Indigenous Peoples and includes a proposed goal about collaborating with First Nations in regional liquid waste management: First Nations are actively involved in regional liquid waste management. Strategies and solutions reflect First Nations' priorities and respect Indigenous Knowledge and the Rights of Indigenous Peoples while collaborating on areas of shared significance. The strategies and solutions in the plan reflect key themes heard during engagement with First Nations. Metro Vancouver aspires to reflect First Nations' priorities, incorporate Indigenous Knowledge, and prioritize collaborating on areas of shared significance. The Plan: • Acknowledges that liquid waste management has impacts on First Nations communities and lands • Outlines a commitment to work with First Nations to increase their influence on the projects and plans that affect their rights and interests • Recognizes First Nations have an important role in stewardship of the region's land, water, and air • Seeks to incorporate Indigenous Knowledge and actively involve First Nations in regional liquid waste management. The following proposed acctions further support this feedback: 9.2, 10.2, 12.4, 13.4, 20.1.
124	Metro Vancouver Youth and Education Advisory Panel Meeting	Apr 30, 2024	*Discussion Question: How will we know when we've reached our goals? What would you use to measure achievement of these goals, from your perspective?* *Goal 1 - People and the environment are protected through our management of liquid waste* 1 Beach closures decreasing - Coliform connection + sharing this kind of info ("clean water metrics") reported to public eg. like air quality in weather reports -- Sampling at WWTP - penalties for pollutants * Challenge of connecting the goal entirely to management of liquid waste - More information collected (soaps, tire chemicals) and that data going down	Wastewater treatment effluent water quality sampling results are made publicly available through reports on Metro Vancouver's website here https://metrovancouver.org/services/liquid-waste/reports-and-resources Metro Vancouver prioritizes contaminants for monitoring programs and source control using the Canadian Council of Ministers of the Environment Canada-wide Strategy for Management of Municipal Wastewater Effluent Risk Management Decision Framework. Further proposed actions in the updated LWMP to support this feedback include: 4.1, 12.4, 13.2, 13.3, 19.1, 19.2, 19.3.
125	Metro Vancouver Youth and Education Advisory Panel Meeting	Apr 30, 2024	*Discussion Question: How will we know when we've reached our goals? What would you use to measure achievement of these goals, from your perspective?* *Goal 3 - Investments in infrastructure meet the region's need for growth and provide equitable, long-term value through collaboration* *Goal 5 - Resilient liquid waste infrastructure and systems adapt to climate change and other stressors* - Pipe separation pilot project progress towards completetion *Dashboard/Traffic light report -- Where we are at in the goals? Heat recovery - amount increase (increase efficiency of the plant)	The following proposed actions support this feedback: 8.1, 8.2, 8.4, 8.8, 9.5, and performance indicator 9A. As well, the updated LWMP proposes to develop a dashboard template to report on performance indicators from the LWMP.
126	Metro Vancouver Youth and Education Advisory Panel Meeting	Apr 30, 2024	*Goal 3 - Investments in infrastructure meet the region's need for growth and provide equitable, long-term value through collaboration* Show what MV predicts for growth in different goals/areas. - Population projections Worded poorly/confusing. Second half of the sentence isn't clear. - What does equitable look like? --> And in what areas?	Metro Vancouver updates regional and municipal population projections on a regular basis to guide land use and infrastructure planning. The updated LWMP will include strategies and actions to continue to provide services for a growing population in a changing urban climate. Some of the proposed actions for Metro Vancouver and members to address population growth and urban density include: • Creating and updating Master Sewer Servicing Plans to plan for and accommodate new and projected growth and development • Aligning and coordinating regional and municipal wastewater management services with Metro 2050, the Regional Growth Strategy and municipal Official Community Plans.

127	Metro Vancouver Youth and Education Advisory Panel Meeting	Apr 30, 2024	*Goal 5 - Resilient liquid waste infrastructure and systems adapt to climate change and other stressors* Look at past data to develop baseline Remove the outdated term "fight climate change" in Goal 5 explanation, use instead "mitigate" or "address"	The explanation for this goal was updated to change "fight climate change" to "target climate change" based on this feedback. Proposed action 2.1 further supports this feedback.
128	Metro Vancouver Youth and Education Advisory Panel Meeting	Apr 30, 2024	*Goal 2 - Reduction, reuse, and recovery of resources are prioritized at every stage* Show what's going where -> Visible, clear, metrics. -> What is cost? Savings?	Proposed metrics for resource recovery include: 15A Beneficial use of Nutrifor biosolids (percent of total biosolids generated); 15B In-region use of Nutrifor biosolids (percent of total biosolids generated); 16A Amount of energy recovered from liquid waste system (gigajoules).
129	Metro Vancouver Youth and Education Advisory Panel Meeting	Apr 30, 2024	*Discussion Question: It's 10 years from now. Looking at the goals we've set, and knowing the increasing impacts of climate change, population growth, demand for housing and resources … Is anything missing?* - Human centric focus - what does it look like? - The role an individual can make --> What actions individuals + communities can take. - Make it salient - when I flush, where does it go? - How are we measuring equity? Surveying people in these areas? Demographics? Etc.	Metro Vancouver can consider these areas of focus when looking at measuring the success of the LWMP goals.
130	Metro Vancouver Youth and Education Advisory Panel Meeting	Apr 30, 2024	*Topic: Affordability* - Staying within or close to budget on projects (eg. North Van WWTP) - First Nations - What does engagement mean? Consulted or more? --> Funding dollars? Show what's assigned to each goal. Help MV stay accountable. Serves as a metric.	Metro Vancouver can consider these areas of focus when looking at measuring the success of the LWMP goals.
131	Metro Vancouver Youth and Education Advisory Panel Meeting	Apr 30, 2024	*Topic: What is Health?* - What are we measuring? - Species inventory/categorizing	Metro Vancouver can consider these areas of focus when looking at measuring the success of the LWMP goals.
132	Email: Liquid Waste management plan - effluent reuse	May 5, 2024	I read some of the engagement about the liquid waste management plan and I am wondering about reuse of the treated effluent. Has there been any discussion around reusing the treated water, particularly for agriculture? With growing concerns of seasonal drought and the fact that agriculture accounts for a large portion of global water demand, has this option been explored at Metro Vancouver and within the proposed plan?	Proposed action 16.2 supports this feedback, along with 3.5b).
133	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To encourage everyone to take action to **improve the quality** and **reduce the quantity** of wastewater at the source*: Engage and educate all producers of wastewater (residents, business, industry, institutions, governments) to recognize the impact their actions have on the health of local waters and their role in reducing the pollutants entering our wastewater, and the amount of extra water entering the wastewater management system.	The following proposed actions support this recommendation: 3.1, 3.2, 3.3, 3.5, 4.1, 4.2.
134	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To encourage everyone to take action to **improve the quality** and **reduce the quantity** of wastewater at the source*: Encourage water conservation to reduce the need for moving larger volumes of wastewater, the demand for additional wastewater treatment capacity, the cost of wastewater management, and GHG emissions associated with the pumping and treatment of wastewater.	The following proposed actions support this recommendation: 3.1, 3.3, 3.5.
135	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To encourage everyone to take action to **improve the quality** and **reduce the quantity** of wastewater at the source*: Investigate and identify best practices to intercept pollutants in stormwater (urban run-off) before they reach streams and waterways, and support restoration initiatives and studies across the region with a focus on fish-bearing streams.	The following proposed actions help support this recommendation: 10.4, 10.5, 11.4, 12.4.

136	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To encourage everyone to take action to **improve the quality** and **reduce the quantity** of wastewater at the source*: Create a list (e.g., "Top Ten") of priority pollutants in stormwater and wastewater, and monitor progress to reduce them across Metro Vancouver.	For stormwater, the Adaptive Management Framework considers chemical and biological parameters, to be monitored by municipal members. Metro Vancouver's wastewater treatment plant operational certificates take into account top pollutants. They are monitored by Metro Vancouver regularly. Proposed action 19.3 further supports this.
137	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To encourage everyone to take action to **improve the quality** and **reduce the quantity** of wastewater at the source*: Cooperate with researchers to advance understanding of impacts on aquatic species and ecosystems from stormwater and wastewater pollution, and develop effective prevention measures.	Proposed actions help support this recommendation: 4.1, 4.2, 12.1, 12.4, 13.2, 13.3, 19.1, 19.3, 20.1.
138	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To encourage everyone to take action to **improve the quality** and **reduce the quantity** of wastewater at the source*: Engage all levels of government to identify, regulate, enforce, and incentivize the reduction or elimination of pollutants at the source.	Proposed action 4.1 supports this recommendation.
139	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To **improve the quality** of the region's stormwater/wastewater and **reduce the pollutants** it carries*: Continue to increase the implementation of green infrastructure across the region, in alignment with the Climate 2050 Roadmap for Nature and Ecosystems, and the Regional Green Infrastructure Network: Invest in the maintenance of green infrastructure and monitor and assess its outcomes for stormwater management in a changing climate, to constantly improve its success.	Proposed actions 10.5, 11.4, 12.3 support this recommendation.
140	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To **improve the quality** of the region's stormwater/wastewater and **reduce the pollutants** it carries*: Monitor the implementation of Integrated Stormwater Management Plan (ISMP) objectives in land use practices across Metro Vancouver members. In particular, require Metro Vancouver members to monitor and report changes within each ISMP area in: a. Effective impervious area (EIA) - permeable surface or effective permeable surface b. Tree canopy cover (riparian and non-riparian) c. Conditions for indigenous fish populations.	Proposed actions 10.2, 10.4, 11.2, 11.3, 12.4 help support this recommendation.
141	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To **improve the quality** of the region's stormwater/wastewater and **reduce the pollutants** it carries*: Work to remove regulatory barriers (such as in the BC Building Code) to encourage the use of green infrastructure rather than restrict it. Green infrastructure and associated stormwater management practices that require regulatory update include: - Disconnection of roof downspouts to storm sewers - Authorization of stormwater diversion from one property to another, in safe circumstances (for example school parking lot to municipal boulevard; municipal street to hospital landscaping; residential building roofs to adjacent parkland) - Increased protection of tree canopy More use of bioswales, enhanced ditches (i.e. informally landscaped), green roofs, rain gardens	While many of these actions would fall under municipal jurisdiction and consideration, proposed actions 10.2 and 11.2 help support this recommendation.
142	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To **improve the quality** of the region's stormwater/wastewater and **reduce the pollutants** it carries:* Invest in green infrastructure, in conjunction with appropriate grey infrastructure, as a response to climate and land use changes, and prioritize improvements in problematic stormwater catchment areas that convey the highest amount of pollutants to the most vulnerable receiving waters.	Proposed actions 10.5, 11.4, 12.3 support this recommendation.

143	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To **improve the quality** of the region's stormwater/wastewater and **reduce the pollutants** it carries*: Create a regional map and dashboard that provide information and data on: - The types of pollutants that enter the systems and their sources (e.g. industry, homes, businesses) - ISMP trends, indicators, measures for success, and outcomes - ISMP implementation - The sewage and stormwater systems, showing where wastewater enters and exits the system - All green infrastructure installations in the region - The progress of sewer separation - The annual number and volume of combined and sanitary sewer overflows - Environmental and ecological information - First Nations cultural sites and activities	The LWMP proposes an online Rainwater dashboard for reporting on Integrated Stormwater (Watershed) Management Plan implementation, and an Inflow and Infiltration (I&I) dashboard, as well as online reporting of all performance indicators and progress on all actions. Proposed actions 6.1, 6.2, 6.3, 11.3 support this recommendation.
144	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To strengthen our knowledge and understanding of **local water quality** and **emerging and traditional pollutants***: Encourage the gathering of high-quality data and knowledge among First Nations, environmental and academic organizations, Metro Vancouver, member jurisdictions, and senior levels of government. Create a data clearing house to coordinate monitoring, data standards, data objectives, data quality, analytics, and study framework.	Proposed actions 10.2, 12.1, 12.4, 19.1, 20.1 help support this recommendation.
145	Presentation-LWMP PAC Recommendations-REAC-LWSC_SILG	Jun 26, 2024	*To strengthen our knowledge and understanding of **local water quality** and **emerging and traditional pollutants***: Facilitate a network to share and analyze data across the region.	Proposed action 12.4 will help to support this recommendation.
146	Online Public Survey	Jul 15, 2024	Concerns about how increasing urban density and population growth, in part as a result of provincial housing legislation and federal immigration legislation, will impact the capacity of an already aging wastewater system.	Metro Vancouver updates regional and municipal population projections on a regular basis to guide land use and infrastructure planning. The updated Liquid Waste Management Plan will include strategies and actions to continue to provide services for a growing population in a densifying urban region. Some of the proposed actions for Metro Vancouver and members to address population growth and urban density include: • Creating and updating Master Sewer Servicing Plans to plan for and accommodate new and projected growth and development. • Aligning and coordinating regional and municipal wastewater management services with the Metro 2050 Regional Growth Strategy and municipal Official Community Plans. Proposed actions under Strategies 1 and 2 address this feedback.
147	Online Public Survey	Jul 15, 2024	Concerns about how cost escalations on the North Shore Wastewater Treatment Plant Program are resulting in significant tax and utility rate increases for affected residents. Calls for an independent review of the project and comments about Metro Vancouver's governance structure.	Metro Vancouver is acutely aware of the concerns around how the updated costs to deliver the North Shore Wastewater Treatment Plant Program will impact residents of this region. We take these concerns seriously. On July 24, 2024, Metro Vancouver's Board of Directors passed a resolution to confirm initiation of an independent performance audit of the North Shore Wastewater Treatment Plant Program. The performance audit will include retaining reputable, experienced external legal counsel to advise the Board on the performance audit. The external legal counsel will work with lawyers representing Metro Vancouver in ongoing litigation related to the North Shore project to develop and recommend a scope of work, terms of reference, and a process for selecting an independent and qualified reviewer. Metro Vancouver will provide updates as available.

148	Online Public Survey	Jul 15, 2024	Comments about how regional projects are delivered and how costs are allocated. Suggestions to change cost apportionment bylaw to address how costs are allocated. Comments about the need to ensure a skilled workforce is in place to deliver major projects.	Over the course of three Board budget workshops in April and May 2024, the Board discussed the current model of four sewerage areas for Liquid Waste Services cost recovery, as well as the potential implications of moving to a single sewerage area. Under a single sewerage area, costs would be spread evenly across the entire region, rather than varying by location. Staff are planning to update the Board on implications of moving to a single sewerage area at next year's Board Budget Workshop, in spring 2025. Metro Vancouver provides vital services, including clean drinking water and wastewater treatment, to 2.8 million people. We take oversight and management of our projects very seriously. In 2020, we created a Project Delivery department to oversee major projects. We also implemented a new cost estimating framework to provide comprehensive estimates for project costs, and a standardized process to ensure there are regular points for progress reporting on large, multi-year projects. These procedures are consistent and robust and ensure elected officials and staff from Metro Vancouver's member jurisdictions, as well as the public, have insight into project management. The staff, consultants, and contractors working on our projects are selected through rigorous hiring and procurement processes, and are subject to ongoing performance monitoring.
149	Online Public Survey	Jul 15, 2024	Concerns about wastewater infrastructure being able to withstand and respond to climate change, including extreme weather and ocean acidification.	A key focus for Metro Vancouver as well as the updated Liquid Waste Management Plan is planning for and responding to the impacts of climate change. To protect regional and municipal wastewater infrastructure from the effects of climate change, the updated Liquid Waste Management Plan proposes to enhance climate resilience by: • Collaborating with other jurisdictions and organizations to share and analyze climate data in order to regularly update regional climate projections, ensuring that current and future infrastructure planning uses up-to-date climate data and information. • Conducting climate vulnerability assessments and preparing climate change adaptation plans for regional infrastructure. • Continuing to plan, locate, design, and adapt infrastructure, assets, and operations to address climate hazards, risks, and vulnerabilities. • Conducting research trials at regional infrastructure locations to evaluate the potential of innovative technologies such as ocean alkalinity enhancement to remove carbon dioxide from water while mitigating ocean acidification, or biorock to protect shorelines and create habitat. Proposed actions under Strategies, 1, 2 and 17 supports this feedback.
150	Online Public Survey	Jul 15, 2024	Concerns about the seismic resilience of the wastewater system, including wastewater treatment plants.	Metro Vancouver designs its wastewater treatment plants to the highest level of seismic performance in the BC Building Code. The updated Liquid Waste Management Plan addresses seismic resilience by: • Continuing to plan, locate, design, and adapt infrastructure, assets, and operations to address hazards, risks, and vulnerabilities, including seismic events. Proposed actions under Strategy 2 addresses this feedback.
151	Online Public Survey	Jul 15, 2024	Concerns about pollutants in stormwater (e.g. road salt, sediment, metals, oils, 6PPD quinone from car tires) harming fish-bearing rivers and streams. Suggestions to increase monitoring and mitigation efforts and explore stormwater treatment options.	The regulation of pollutants in stormwater is beyond Metro Vancouver's mandate and rests with other orders of government, while the management of stormwater falls primarily under the jurisdiction of local municipalities. Local municipalities manage the impact of stormwater on local waterways through their Integrated Watershed Management Plans, formerly known as Integrated Stormwater Management Plans. Municipalities will continue to monitor waterways using the Adaptive Management Framework, and update their Integrated Watershed Management Plans as necessary to mitigate pollutants, and explore treatment options. Metro Vancouver and its member jurisdictions a Stormwater Interagency Liaison Group, with a mandate to advise and work through technical stormwater issues with Metro Vancouver member jurisdictions, and senior government agencies. This group will be restructured as part of the Liquid

				Waste Management Plan update to lead local research on stormwater and act as the primary regional advocate with provincial and federal regulators to advance concerns about stormwater pollutants. Proposed actions under Strategies 10, 11, and 12 lend support to this feedback.
152	Online Public Survey	Jul 15, 2024	Comments supporting the use of green infrastructure. Suggestions for Metro Vancouver to support municipalities with these efforts. Suggested actions to incentivize (or mandate, where possible) residents, industry, and businesses to manage stormwater effectively. Examples of such approaches include disconnecting downspouts, increasing tree canopy, installing permeable surface in developments, protecting and enhancing riparian areas, and installing rain gardens, bioswales, green roofs, natural lawns, detention ponds, and porous pavement.	A key focus for stormwater management in the updated Liquid Waste Management Plan is the enhancement and expansion of green infrastructure in the region. Some proposed actions for Metro Vancouver and members include: • Member municipalities will expand the use of green infrastructure, blue infrastructure, and other practices to mimic natural watersheds, reduce runoff and discharge, improve water quality, and increase climate resilience. These approaches will also support the effectiveness of the region's grey infrastructure. • Member municipalities will update and harmonize rainwater policies, programs, and bylaws, improving the implementation of green infrastructure across the region. Proposed actions under Strategies 10 and 11 will lend support to this feedback. Metro 2050, the Regional Growth Strategy, also states that member municipalities will adopt Regional Context Statements that identify local ecosystem protection and tree canopy cover targets, and demonstrate how these targets will contribute to the regional targets.
153	Online Public Survey	Jul 15, 2024	Suggestions to update building and development standards with effective solutions to encourage green infrastructure.	The updated Liquid Waste Management Plan proposes that Metro Vancouver and members will seek an update to the Master Municipal Construction Documents so that green infrastructure guidelines become standards, helping to improve and expand green infrastructure implementation across the region. Proposed action 11.4 addresses this feedback.
154	Online Public Survey	Jul 15, 2024	Establish site-specific standards for on-site or adjacent public land infiltration of roof and pavement runoff to protect local streams by filtering out pollutants and decreasing flows during storms and flooding. Stormwater storage should also be considered for the same reason. Concerns about increased stormwater runoff that will result from increased urban density.	Expanding the use of green infrastructure is a key focus of the Liquid Waste Management Plan. Green infrastructure solutions mimic natural systems that slowly infiltrate rainwater into the ground, better filtering the runoff to help reduce pollutants and slowing down flows to help reduce flooding. The updated Liquid Waste Management Plan also proposes to seek an update to the Master Municipal Construction Documents so that green infrastructure guidelines become standards, which will allow developers to refer to a common set of approaches and instructions. As for stormwater storage, municipal Integrated Watershed Management Plans develop stormwater actions, which could identify areas for green infrastructure and stormwater storage where appropriate. Proposed actions under Strategies 10, 11, and 12 will lend support to this feedback.

155	Online Public Survey	Jul 15, 2024	Comments about the importance of Metro Vancouver and municipalities collaborating to conduct watershed-scale stormwater management. Comments about the importance of aligning stormwater management and land use planning.	Land use planning and watershed health are inextricably linked, and must be considered holistically. Metro Vancouver and members use Integrated Watershed Management Plans to balance land use planning; stormwater engineering; flood and erosion protection; and environmental protection. The updated Liquid Waste Management Plan has actions to help member jurisdictions better align land-use planning and development with their Integrated Watershed Management Plans to ensure development decisions support watershed health objectives, including protecting riparian areas. Members in the same watershed will also collaborate with each other and with First Nations to develop and update Integrated Watershed Management Plans to ensure that watersheds are managed holistically. Proposed actions under Strategies 10, 11, and 12 will lend support to this feedback. Metro 2050, the Regional Growth Strategy, also lays out actions to support the alignment of land use planning and stormwater management. (See action 3.2.7 in Metro 2050.)
156	Online Public Survey	Jul 15. 2024	Suggestions to lobby other orders of government to regulate stormwater pollution.	Metro Vancouver and its member jurisdictions have a Stormwater Interagency Liaison Group, with a mandate to advise and work through technical stormwater issues with Metro Vancouver member jurisdictions and senior government agencies. The updated Liquid Waste Management Plan includes an action to revise the group's terms of reference to lead local research on stormwater and act as the primary regional advocate with provincial and federal regulators. Proposed action 12.1 will lend support to this feedback.
157	Online Public Survey	Jul 15. 2024	Suggestions to increase street cleaning and catch basin maintenance. Suggestions for community "adopt a catch basin" programs.	Street cleaning and catch basin maintenance are municipal activities and some municipalities have programs similar to "adopt a catch basin." While these kinds of programs are up to the individual municipalities, the updated Liquid Waste Management Plan has several actions to enhance collaboration throughout the region on stormwater management, including hosting a regular forum on stormwater management practices among member municipalities, First Nations, and other interested parties, which could support the advancement of municipal programs like these. Proposed actions under Strategies 10, 11, and 12 will lend suppport to this feedback.
158	Online Public Survey	Jul 15. 2024	Suggestions to implement a stormwater fee or utility to fund more stormwater management measures.	Dedicated funding will be critical to support effective stormwater management in the region. The updated Liquid Waste Management Plan will propose that members establish dedicated stormwater funding within three years to ensure consistent and reliable service delivery for stormwater management. Proposed action 11.1 incorporates this feedback.
159	Online Public Survey	Jul 15. 2024	Suggestions to accelerate the daylighting of streams.	Daylighting streams is largely a municipal initiative and often included in their sewer separation or watershed management plans. Stream daylighting can also be explored and recommended in the municipal Integrated Watershed Management Plans. The updated Liquid Waste Management Plan proposes that a template be developed for an online stormwater data dashboard for member municipalities to publicly report on Integrated Watershed Management Plan progress and key indicators of watershed health. The length of daylighted waterways has been suggested as a potential metric, which would likely encourage more daylighting of streams.
160	Online Public Survey	Jul 15. 2024	Comments about future-proofing wastewater facilities for population growth, climate change, and future regulations.	The updated Liquid Waste Management Plan proposes the following actions to continue to design and plan for population growth, climate change, and potential future regulation changes: • Continue to conduct climate change vulnerability assessments and prepare adaptation plans for Metro Vancouver infrastructure, assets, and operations in each sewerage area to enhance resilience to future climate conditions (updating existing ones and creating new ones where needed). • Create and update Master Sewer Servicing Plans to accommodate growth and development. Metro Vancouver will continue to follow risk assessment approach established by the Canadian Council of Ministers of Environment Canada-wide Strategy for Management of Municipal Wastewater (CCME CWS-MMWW) to meet regulatory requirements. Metro Vancouver will identify and pursue risk mitigation approaches including source control, treatment process optimization, and treatment upgrades. Metro Vancouver has planned wastewater treatment projects to improve effluent quality

				and accommodate a growing population. Proposed actions under Strategies 1 and 2 lend support to this feedback.
161	Online Public Survey	Jul 15. 2024	Comments urging Metro Vancouver to address odour at wastewater treatment plants and across the wastewater system.	Metro Vancouver understands that odour is a concern for community members living near wastewater treatment plants. Wastewater treatment plants are designed to manage odour. New wastewater treatment plants and new treatment process units added to existing plants are designed to meet stringent, modern odour criteria. As such, all of Metro Vancouver's wastewater treatment plants are improving odour controls as plants are upgraded and improved.
162	Online Public Survey	Jul 15. 2024	Suggestions to consider small, decentralized wastewater treatment plants to improve water quality and reduce load on the large plants.	Previous studies that examined decentralized wastewater treatment plants have shown that this approach would not be feasible in the region due to land tenure, complexity, cost, and regulatory requirements. In addition, Metro Vancouver would still need to operate all five of its existing wastewater treatment plants to continue to meet the needs of the region. For this reason, decentralized wastewater treatment plants are not being considered at this time.
163	Online Public Survey	Jul 15. 2024	Comments about the need to prioritize upgrades to all wastewater treatment plants to remove more pollutants, regardless of cost.	Metro Vancouver follows the nationally developed and accepted risk assessment approach established by the Canadian Council of Ministers of Environment Canada-wide Strategy for Management of Municipal Wastewater (CCME CWS-MMWW) to determine effluent discharge objectives and meet National Performance Standards. This prescribed process prioritizes upgrades to wastewater treatment plants based on various factors, including plant flows (how much water passes through the plant) and characteristics of the receiving water body for the treated effluent. The CCME-CWS-MMWE process requires ongoing monitoring of wastewater and the receiving environment to verify that wastewater treatment plants are continuing to meet the receiving environment water quality objectives and guidelines and is operating without an adverse effect on the environment.
164	Online Public Survey	Jul 15. 2024	Comments about how Metro Vancouver should adhere to provincial and federal regulatory requirements and not upgrade wastewater treatment plants beyond these requirements to reduce costs.	Metro Vancouver follows the nationally developed and accepted risk assessment approach established by the Canadian Council of Ministers of Environment Canada-wide Strategy for Management of Municipal Wastewater (CCME CWS-MMWW) to determine effluent discharge objectives and meet National Performance Standards. This prescribed process prioritizes upgrades to various wastewater treatment plants based on various factors, including plant flows and characteristics of the receiving water body for the treated effluent. The CCME-CWS-MMWE process requires ongoing monitoring of wastewater and the receiving environment to verify that wastewater treatment plant is continuing to meet the receiving environment water quality objectives and guidelines and is operating without an adverse effect on the environment.
165	Online Public Survey	Jul 15. 2024	Requests for Metro Vancouver and municipalities with combined sewers (Vancouver, New Westminster, and Burnaby) to accelerate separation of these sewers to prevent overflows.	Several proposed actions in the updated Liquid Waste Management Plan encourage and expedite combined sewer separation, including developing five-year intermediate targets for municipal and regional separation of prioritized combined catchments. Other actions focus on reducing combined sewer overflows and their impacts on the receiving environment, through system optimization and operational controls. Proposed actions under Strategies 8 and 9 support this feedback.

166	Online Public Survey	Jul 15. 2024	Comments about the importance of improving water quality through better management of stormwater and rainwater (and the pollutants its runoff carries) while sewer separation work is ongoing.	There are numerous proposed actions in the updated Liquid Waste Management Plan to mitigate the impacts to water quality while sewer separation efforts continue, including: • Continued and enhanced monitoring and analysis of combined sewer overflows' impact on the environment • Continued and enhanced wastewater system optimization to minimize the volume and sanitary sewage loading of sewer overflows • Initiatives to expand and enhance the use of green infrastructure to manage stormwater flows and pollutants Proposed actions under Strategies 8, 9, and 10 lend support to this feedback.
167	Online Public Survey	Jul 15. 2024	Concerns that deferred maintenance and underfunding could lead to system failures and inefficiencies.	In the updated Liquid Waste Management Plan, proposed actions for Metro Vancouver and members to continue to maintain the condition and performance of the sewerage system include: • Inspecting sanitary sewers on a twenty-year cycle • Maintaining current maps of sewerage inspection, condition, and repairs • Continuing to develop and implement asset management plans that address risks, including climate change and seismic events, and target a 100-year replacement or rehabilitation cycle for sewerage infrastructure Proposed actions under Strategies 1 and 2 address this feedback.
168	Online Public Survey	Jul 15. 2024	Comments about the importance of considering all the costs assets will incur over their lifespans (life cycle costing) to determine where we need to invest to protect the environment for current and future generations.	Metro Vancouver integrates life cycle cost analysis into the capital planning process for new and upgraded infrastructure projects. In addition to financial considerations, we prioritize other factors including impacts to human health and the environment, to ensure responsible and sustainable infrastructure development. Metro Vancouver and its members are actively committed to the long-term stewardship of sewerage infrastructure. The updated Liquid Waste Management Plan includes an action for Metro Vancouver and member municipalities to continue to develop and implement asset management plans that target a 100-year replacement or rehabilitation cycle for sewerage infrastructure.
169	Online Public Survey	Jul 15. 2024	Comments about the importance of providing quality wastewater management in an economically sustainable way for current and future generations.	One of the five goals proposed for the updated Liquid Waste Management Plan is: Sewer infrastructure across our growing region is reliable, affordable, and equitable now and for future generations. Asset management practices such as the development of asset management plans will ensure that Metro Vancouver is maximizing the full value of regional assets over their lifecycle.
170	Online Public Survey	Jul 15. 2024	Suggestions to seek funding for wastewater treatment plant and system upgrades from the federal and provincial governments, as well as industry and developers.	Metro Vancouver derives funding from a number of sources, including federal and provincial contributions to major project upgrades. Developers contribute through Development Cost Charges for new residential and non-residential developments, which help pay for new sanitary sewer works expansions that are needed to deliver wastewater services to the future occupants of these buildings. These fees are defined in the Development Cost Charge Bylaw and new rates will be phased in over three years beginning January 1, 2025. Contributions from industry can take various forms, such as direct funding for mutually beneficial projects such as the pilot project with Parkland Fuel Corporation to investigate how to create biocrude oil from wastewater solids, or in-kind contributions to support project development.
171	Online Public Survey	Jul 15. 2024	Comments about the importance of investing in wastewater treatment now, as costs will only escalate in the future.	The last few years have seen an escalation in construction cost paired with a labour shortage that has caused significant cost increases in the industry. With the population expected to increase it is vital that we invest in new infrastructure. In addition, much of the existing wastewater infrastructure is aging and in need of replacement. Delays to building new infrastructure carry environmental risk and potential for regulatory non-compliance. Metro Vancouver is aware of these factors and continuing work to upgrade the system.
172	Online Public Survey	Jul 15. 2024	Suggestions to spread the costs to upgrade wastewater treatment plants and the wastewater system across the region, in conjunction with water metering.	Upgrade costs are allocated across the Metro Vancouver sewerage districts. All municipalities pay for the capital costs of new facilities, but those within a particular district pay a bigger share for facilities in

				their district. Metro Vancouver is considering alternatives for cost allocation of major projects in the future.
173	Online Public Survey	Jul 15. 2024	Comments about how Metro Vancouver should reuse treated wastewater, rather than returning it to the Fraser River and ocean.	Comments about how Metro Vancouver should reuse treated wastewater, rather than returning it to the Fraser River and ocean. Metro Vancouver's wastewater treatment plants already use treated effluent onsite for non-potable processes. We are working on ways to increase the use of treated wastewater in the region. Treated wastewater can be further treated to higher standards for use as reclaimed water. This includes outdoor and industrial uses such as sewer flushing, street sweeping, hydrovac excavation, landscape watering and street-tree watering. Using reclaimed water helps conserve drinking water. Reclaimed water facilities with truck fill stations are being planned at the new North Shore, Northwest Langley, and Iona Island wastewater treatment plants.
174	Online Public Survey	Jul 15. 2024	Concerns that regardless of monitoring and treatment, harmful contaminants (e.g. PFAS, hormones, medicines, microplastics) are still present in biosolids. Concerns about biosolids being used around groundwater or public places and comments about the importance of stringent biosolids testing.	Because they are prevalent in our daily lives, compounds such as per- and polyfluoroalkyl substances (PFAS), hormones, medicines, and microplastics are found in trace amounts in our bodies, our homes, our environment, our wastewater, and in biosolids. Studies show that our exposure to these compounds from common household products (e.g. soaps, shampoo, non-stick cookware) is far greater than our exposure to the trace amount found in biosolids. Provincial biosolids regulations have specific requirements for land application of biosolids and for the quality of soil that is made with biosolids. These requirements are designed to protect water bodies, human health, and the environment. Metro Vancouver follows a rigorous quality control program and performs thousands of tests every year to ensure that biosolids are high quality and always meet or surpass provincial and federal biosolids regulations. Metro Vancouver also tests its biosolids for unregulated parameters and partners with other organizations and research institutions to stay current with the available science to advance our understanding.
175	Online Public Survey	Jul 15. 2024	Suggestions to use biosolids in parks, empty public lands, golf courses, and BC Hydro lands to improve soil and attract pollinators, as well as for green infrastructure installations. Additional suggestions to make biosolids more accessible to residents for landscaping at a low cost.	Metro Vancouver biosolids, also known as Nutrifor, are used to create Nutrifor landscaping soil, which is a locally-produced, highly fertile topsoil that is used in municipal and regional landscaping projects, parks and greenspaces. We are currently working with academia to advance the use of biosolids in green infrastructure projects such as green roofs. Nutrifor landscaping soil is available for the public to purchase at a low cost through the company NutriGrow, at the Ecowaste Landfill in Richmond. Proposed action 15.5 supports this feedback.
176	Online Public Survey	Jul 15. 2024	Comments about the importance of encouraging greywater use.	Metro Vancouver supports the concept of greywater use as an important water conservation measure, and has published a Non-Potable Water Systems Guidebook to support greywater use in the region.
177	Online Public Survey	Jul 15. 2024	Comments about how reducing the wastewater that enters wastewater treatment plants results in cost savings. Comments about how water metering should be required across the region to encourage water conservation.	Actions to advance water conservation in the next Liquid Waste Management Plan include: • Advancing regional water metering by requiring members to mandate metering on new construction by 2028 and requiring members to increase water metering incrementally over time by 2035. • Developing a region-wide water conservation program for the institutional, commercial, industrial and agricultural sectors Proposed actions under Strategy 3 lend support to this feedback.

178	Online Public Survey	Jul 15. 2024	Calls for more public education for source control, water conservation, the hydrologic cycle, keeping extra water out of the system from private plumbing, and stormwater management actions that can be taken in our homes and businesses.	Metro Vancouver is committed to educating the public on the importance of water, wastewater, and the role everyone has to play to help keep our local waters healthy. Regional campaigns are run every year to reduce grease, unflushables (e.g. baby wipes, hair, and medicines), microfibres (from laundering of textiles), surfactants (a chemical in soaps and detergents that is harmful to marine life) and excess water in the sewer system from inflow and infiltration. Water restrictions are in effect from May 1 to October 15, and we communicate those as well as sharing best practices for maintaining healthy lawns while reducing water use. The annual water conservation behaviour change campaign conveys the value of water and encourages residents to use our treated drinking water wisely so we have it for where it's needed most: cooking, cleaning, and drinking. Metro Vancouver also provides stormwater management resources for municipalities and residents. Proposed actions 4.1, 5.1, and 12.1 lend support to this feedback.
179	Online Public Survey	Jul 15. 2024	Suggestions to educate youth, as their understanding and action will be key to long-term, societal behaviour changes.	Metro Vancouver supports teachers and youth with resources and experiential learning opportunities to connect to local sustainability topics such as wastewater management, climate change, and ecological health. This is done through Metro Vancouver's K-12 curriculum-connected resources, tours for school groups, and leadership programs for youth.
180	Online Public Survey	Jul 15. 2024	Concerns that cruise ships and other marine vessels in the region's inlets and marinas are dumping waste that is harmful to the environment.	Metro Vancouver is aware of this discharge source and knows that it impacts water quality in the region. Discharges from marine vessels such as cruise ships into the marine environment are regulated by the federal government (Transport Canada). The Government of Canada also requires ships to comply with requirements in the International Convention for the Prevention of Pollution from Ships (MARPOL). Advocating directly to Transport Canada and MARPOL about their cruise ship and marine vessel discharge requirements would be an ideal way to encourage change.
181	Online Public Survey	Jul 15. 2024	Concerns about E.coli contamination worsening in places like False Creek.	E. coli concentrations vary day to day, and year to year. There have been periods of elevated counts, where a source of contamination was identified and infrastructure repaired, thereby reducing E. coli. concentrations. The last five years of monitoring results are available in Appendix B of Metro Vancouver's Environmental Management and Quality Control Annual Report The Metro Vancouver website also has links to Environmental Management and Quality Control Annual Reports for the last five years: Reports and Resources | Metro Vancouver
182	Online Public Survey	Jul 15. 2024	Comments that Metro Vancouver should identify a priority list of harmful pollutants in stormwater and find ways to reduce/mitigate.	The regulation of stormwater discharges is beyond Metro Vancouver's mandate and rests with higher orders of government, while the management of stormwater falls, for the most part, under the jurisdiction of local municipalities. Local municipalities manage the impact of stormwater pollutants on local waterways through their Integrated Watershed Management Plans. Municipalities will continue to monitor waterways using the Adaptive Management Framework, and update their Integrated Watershed Management Plans as necessary to mitigate pollutants, and explore treatment options. Metro Vancouver and its member municipalities have a Stormwater Interagency Liaison Group, with a mandate to advise and work through technical stormwater issues with Metro Vancouver member jurisdictions, and senior government agencies. This group will be restructured as part of the Liquid Waste Management Plan update to lead local research on stormwater and act as the primary regional advocate with provincial and federal regulators to advance concerns about stormwater pollutants. Proposed actions under Strategies 10, 11, and 12 will lend support to this feedback.
183	Online Public Survey	Jul 15. 2024	Calls to work with the federal government to ban products and chemicals that are harmful to human health and the environment.	The updated Liquid Waste Management Plan includes a proposed action to advocate for increased provincial and federal regulations on the manufacturing and use of products with contaminants. Proposed action 4.1 addresses this feedback.

184	Online Public Survey	Jul 15. 2024	Calls for more enforcement and higher penalties for industrial and commercial polluters.	A new bylaw (GVS&DD Notice of Bylaw Violation Enforcement and Dispute Adjudication Bylaw) was adopted by the Metro Vancouver Board in July 2024. This bylaw provides additional enforcement tools, including penalty amounts up to $500, to encourage compliance with Metro Vancouver's liquid waste bylaws. Metro Vancouver reviews and updates its bylaws and fees regularly.
185	Online Public Survey	Jul 15. 2024	Suggestions to make the disposal of hazardous substances easier for residents.	Metro Vancouver will continue to provide guidance for residents on how to dispose of common household chemicals, such as paint, motor oil, antifreeze, gas, pesticides, and flammable liquids through Metro Vancouver Recycles.
186	Online Public Survey	Jul 15. 2024	Comments about the importance of educating the public about the critical nature of preventing and reducing pollution in our homes and businesses. Specific comments about education on cleaning and personal care product alternatives that are better for the environment.	Proposed actions under Strategies 3 and 4 in the updated Liquid Waste Management Plan continue public education on preventing and reducing pollution at the source, through outreach and education to residents and businesses, and youth education programs. Metro Vancouver provides a resource with healthier options for household cleaning products: Better Solutions: Reducing the impact of household chemicals on our waterways - Brochure (metrovancouver.org)
187	Online Public Survey	Jul 15. 2024	Suggestion to require the installation of washing machine filters to remove microplastics.	While the use of filters would help capture microfibres released during the wash, the captured microfibres are generally disposed of in the garbage and could eventually make their way back into the environment. Preventing microfibers from making their way into the system is a more effective approach.
188	Online Public Survey	Jul 15. 2024	Comments about the importance of collaborating with First Nations to listen to, learn from, and incorporate their views.	Enhancing and improving meaningful engagement with First Nations on regional and municipal projects and plans is a key area of focus for the updated Liquid Waste Management Plan. A proposed goal for the updated plan is to actively involve First Nations in regional liquid waste management. Metro Vancouver is working with First Nations to ensure the proposed strategies and solutions reflect First Nations' priorities and respect Indigenous Knowledge and Aboriginal rights while collaborating on areas of shared significance. Some specific proposed actions in the updated Liquid Waste Management Plan to collaborate with First Nations include: • Working with First Nations to develop a framework to prioritize combined sewer separation efforts. • Members will work with First Nations to prioritize watersheds for Integrated Watershed Management Plan development using criteria co-developed with First Nations that consider watershed health and cultural significance as well as Indigenous Rights. • First Nations will participate in Integrated Watershed Management Plan development, monitoring, and review. • A forum will be held at regular intervals to report progress on stormwater management actions, and to foster collaboration and knowledge sharing among member municipalities, First Nations, and other interested parties. Proposed actions under Strategies 1, 4, 9, 10, 12, 13, 17 lend support to this feedback.
189	Online Public Survey	Jul 15. 2024	Calls to educate the public on ways to keep extra water out of the wastewater system and encourage or require residents to inspect private pipes, and replace or repair them, as needed. Suggestions to introduce incentive and rebate programs.	While Metro Vancouver currently has education initiatives to educate the public about extra water coming into the system from private sewer pipes on residential and commercial properties (called "inflow and infiltration"), the updated Liquid Waste Management Plan proposes to expand public education messaging on the relationship between inflow and infiltration and efficient liquid waste management, showing that investing in water-tight (i.e. correctly built and in good condition) private pipes is an effective strategy that can protect the environment and reduce regional infrastructure costs — and ultimately the taxpayer. The updated Liquid Waste Management Plan proposes the following actions: • Metro Vancouver to explore and analyze various approaches for incentives or funding programs to encourage property owners to rehabilitate leaky pipes. • Members to develop and provide these incentive or funding programs. Proposed actions under Strategy 5 address this feedback.

190	Online Public Survey	Jul 15. 2024	Comments that it would be most effective if Metro Vancouver and members were responsible for inspecting and replacing leaky private pipes.	The updated Liquid Waste Management Plan proposes actions for member jurisdictions to require the replacement of private sewer pipes during new construction or renovation. There are actions for members to develop consistent processes to access private properties to conduct inspections when appropriate, and to direct staff to enforce bylaws on private property to prevent unauthorized discharge or rainwater or grounder to sanitary sewers. Proposed actions under Strategy 5 lend support to this feedback.

Liquid Waste Management Plan Update – Phase 3 Engagement Plan – Summary

October 7, 2024

Overview

Metro Vancouver and its members are reviewing and updating their Liquid Waste Management Plan. The current Integrated Liquid Waste and Resource Management Plan, approved by the provincial government in 2011, established the coordinated approach for wastewater management in the Metro Vancouver region. It sets out goals, strategies, and actions for Metro Vancouver and member jurisdictions that help ensure the protection of public health and the environment, while using wastewater as a resource and minimizing treatment costs.

Engagement on the review and update of the Liquid Waste Management Plan is being done over three phases. The first phase began in 2021, following the approval of an engagement strategy by the Greater Vancouver Sewerage and Drainage District (GVS&DD) Board on October 2, 2020, and by the Ministry of Environment and Climate Change Strategy on March 26, 2021. Metro Vancouver staff collaborated with Metro Vancouver member jurisdictions and engaged First Nations, a public advisory committee, and the public to develop content for the updated plan.

In the first phase of the engagement process, the vision and guiding principles were developed and summarized for the April 13, 2022 GVS&DD Board meeting. During the second phase of engagement, draft goals, strategies, and actions were developed in collaboration with GVS&DD member jurisdictions, and with input from First Nations, the public, and other interested parties, including a public advisory committee.

Following GVS&DD Board endorsement of the draft plan, Metro Vancouver will commence a third and final engagement phase, where staff will engage with First Nations, the public advisory committee, and the public on the draft plan. Metro Vancouver will then request that all GVS&DD member councils review and endorse the draft plan at that time. Following this final phase of engagement and Board approval, the updated plan will be submitted to the Ministry of Environment and Climate Change Strategy for consideration and approval.

Project Schedule and Engagement Phases

Phase 1 – Vision and Guiding Principles	Phase 2 – Develop Goals, Strategies, Actions, and Draft Plan	Phase 3 – Plan Review and Approvals
2021	2022-2024	2025

Each phase of engagement has involved tailored engagement with First Nations and a public advisory committee, as well as a public engagement period open to people and organizations interested in the plan update. While First Nations are invited to participate in all public engagement activities, Metro Vancouver has conducted a separate, government-to-government engagement approach with 33 First Nations, a Tribal Council, and Treaty Association with interests in the Metro Vancouver region, as well as the Métis Nation of British Columbia.

An engagement summary report issued at the end of each phase reflects how input received has informed the development of the updated plan.

Engagement Objectives

1. Facilitate a process of reciprocal learning where engagement participants can share their knowledge and experiences to inform plan development, and learn about the benefits and challenges of the wastewater system
2. Co-develop the updated plan with members, working together to draft strategies and actions and to finalize the draft plan
3. Strengthen and build collaborative relationships with First Nations in order to incorporate First Nations input meaningfully into the updated plan, noting where feedback has been incorporated, and if it hasn't, why not
4. Understand perspectives, priorities, and desired outcomes of engagement participants across the region for wastewater management and foster an environment where a wide range of voices and perspectives are shared
5. Support informed engagement and share engagement outcomes
6. Raise awareness about Metro Vancouver and member jurisdictions' role in wastewater management in the region

Engagement Approach

During the third and final phase of engagement, Metro Vancouver is looking for input on:

- The draft Liquid Waste Management Plan, to refine and finalize it for Board approval to submit the plan to the Ministry of Environment and Climate Change Strategy.

Audiences

Metro Vancouver is collaborating directly with member jurisdictions on the plan development. Metro Vancouver is committed to engaging individuals and organizations that may be impacted by or have an interest in the plan update. The provincially-approved Liquid Waste Management Plan Review and Update Strategy includes a list of organizations that will be contacted during engagement. The following groups will continue to be invited to participate in the plan update:

- Government and regulatory agencies, including First Nations, provincial and federal governments,, adjacent regional districts, crown corporations, and health authorities
- Metro Vancouver steering and technical advisory committees
- Liquid Waste Management Plan public advisory committee
- Commercial, institutional, and industrial wastewater generators
- Owners/operators of private liquid waste collection, processing, and treatment businesses
- Industry and business associations, professional associations, and academic institutions
- Community, environmental and non-profit groups, youth and students
- Metro Vancouver residents

Metro Vancouver will continue to keep these groups informed about progress on the plan update and engagement opportunities during the final project phase. There are currently over 870 subscribers to the project email newsletter who will continue to receive regular updates.

Engagement Activities

An overview of Metro Vancouver's communications and engagement activities for the third and final phase of engagement on the plan update are provided below.

Activity	Timing
Inform external audiences that the draft Liquid Waste Management Plan is published, explain its purpose and benefits, and share options for providing comments. 1. Publish an engaging webpage to house: o Draft Liquid Waste Management Plan o Highlighted purpose and benefits o Highlighted major actions o Options for providing comment 2. Correspondence to 33 First Nations, a Tribal Council, and Treaty Association with interest in the Metro Vancouver region, as well as the Métis Nation of British Columbia, to include: o Link to webpage o Invitation to provide written feedback on the draft plan via email o Invitation for meetings with staff to discuss feedback o Follow-up phone calls and emails 3. Correspondence to public advisory committee to include: o Link to webpage o Invitation to provide written feedback on the draft plan via email o Invitation for meetings with staff 4. Correspondence to the project subscriber list to include: o Link to webpage o Invitation to join a public webinar o Invitation to provide written feedback on the plan through an online survey 5. Promote information to broader audience via: o Social media o Email updates o Newsletters o Request member outreach to residents o Advertising (online community newspapers)	First Nations – January 2025 Public advisory committee – January 2025 Public – January 2025
Answer questions and clarify information 1. Host a webinar to walk through the draft Liquid Waste Management Plan and answer any questions o Focus on purpose and benefits 2. Offer to meet with o Other governments o Specific sectors and organizations o Other relevant audiences 3. Respond to email queries to project email and moderate social media	Webinar – January 2025 Meetings – schedule as requested Respond to queries and moderate social media – ongoing
Compile feedback	March 2025

• Collect and review feedback • Create a comment-response table based on all feedback received during this phase	
Analyze/ incorporate into draft plan	March to May 2025
Final Liquid Waste Management Plan to GVS&DD Board • Include engagement summary report, detailing feedback and how feedback was applied	June 2025

Communication Tools

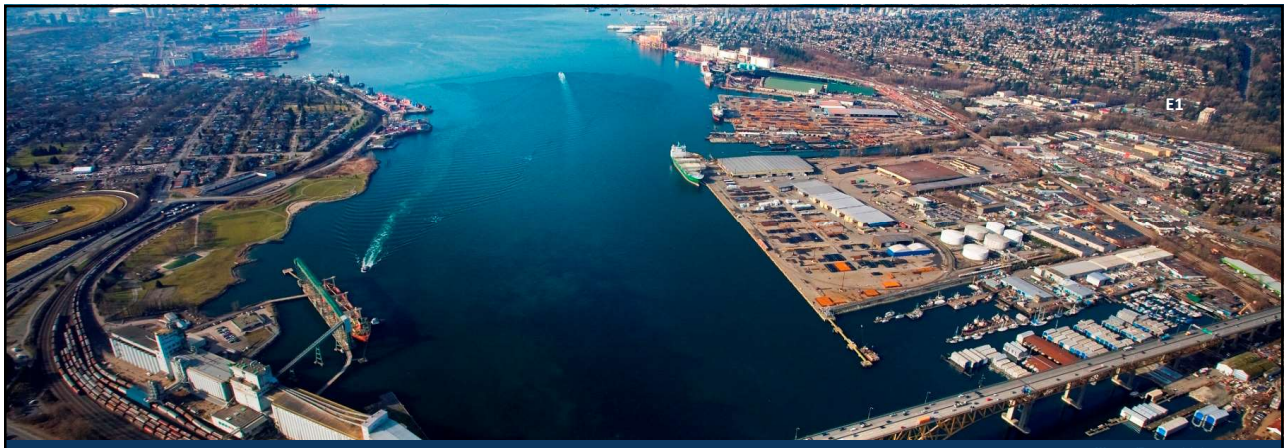
The basic communication tools to support engagement are listed below and will be updated as engagement progresses. Public engagement will also be supported by a comprehensive communications plan to be outlined in a separate document with the objective of ensuring the general public is informed of the plan's purpose and benefits, and providing an opportunity for comment on the draft plan.

Type	Tactic	Date
Overall Materials	Draft Liquid Waste Management Plan for comment	January 2025
	Webpage	January 2025
	Webinar presentation	January 2025
Correspondence	First Nations letters	January 2025
	Email updates / invitations	January 2025
	Social media posts	January 2025
	Newsletters	January 2025
	Digital advertising	January 2025

Regulatory Process

Liquid waste management plans are enabled under the *Environmental Management Act*. Liquid waste management plans must include comprehensive review and engagement for all aspects of the development, amendment, and final content of a waste management plan, with First Nations and other interested parties. The liquid waste management plan is approved by the GVS&DD Board and its member councils for submission to the Minister of Environment and Climate Change Strategy for approval. On March 26, 2021, the Ministry of Environment and Climate Change Strategy approved the engagement-focused plan review and update strategy following its approval by the GVS&DD Board on October 2, 2020. Following receipt of this approval, the formal engagement process began. Following municipal and Board endorsement, Metro Vancouver will submit an engagement summary report and updated plan to the Minister for review. Before approving an updated plan, the Minister must be satisfied that there has been adequate First Nations and public engagement.

Attachment 6



səlilwət /Burrard Inlet

Drafting the Liquid Waste Management Plan

PHASE 2 ENGAGEMENT OVERVIEW

Kris Etches

Program Manager, Community Engagement, Liquid Waste Services

Liquid Waste Committee – November 13, 2024

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ENGAGEMENT TIMELINE

Liquid Waste Management Plan update

Phase 1 – 2021
Vision and Guiding Principles

Phase 2 – 2022 - 2024
Goals, Strategies, Actions, and Draft Plan

Phase 3 – 2025
Plan Approvals

2

ENGAGEMENT TO DATE

Phases 1 and 2

Plan Co-Developers	Meetings
REAC-LWSC & SILG	33
REAC	12
RAAC	4
Liquid Waste Committee	3
GVS&DD Board	2

First Nations	Meetings
First Nations	21

Group	Meetings
Public advisory committee (PAC)	13
Public events and webinars	10

Workshops	Attendees
3 technical workshops	First Nations, PAC, REAC, REAC-LWSC, SILG
2 Metro Vancouver Conference Days	REAC, REAC-LWSC, SILG

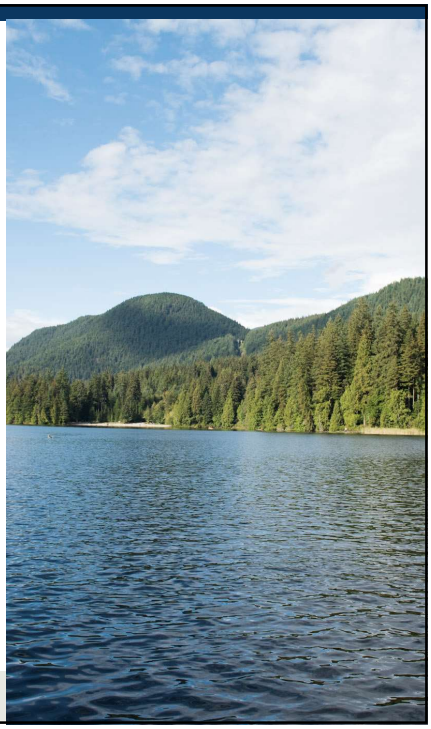
3

FIRST NATIONS ENGAGEMENT

Key takeaways from one-on-one meetings

Kwantlen, Kwikwetlem, Semiahmoo, Squamish, Tsawwassen, and Tsleil-Waututh:

- More substantial decision-making authority
- Measurable water quality improvements – return to shellfish harvesting
- Have been providing similar feedback across projects, often with limited implementation – desire a better process
- Detailed, accessible water quality data online
- Stormwater pollution concerns



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PUBLIC ADVISORY COMMITTEE

Advising on the plan update

Take action to:

- Reduce the quantity of wastewater and its contaminants at the source
- Prevent pollution in rainwater runoff and wastewater
- Strengthen knowledge of local water quality and the effects of emerging and traditional pollutants
- Expand the use of green infrastructure

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PUBLIC SURVEY AND WEBINAR

June 13 – July 15

- Engagement opportunities emailed to 870+ project newsletter subscribers
- Promoted on social media and digital newspapers
- 400 survey respondents
- More than 1,400 comments
- 33 webinar attendees

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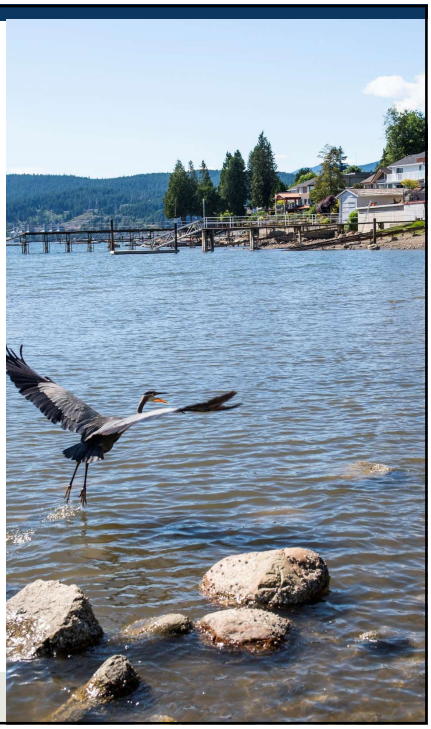
PUBLIC

Key takeaways

- Concerns about project cost increases, oversight
- Cost apportionment for major projects should be spread across region
- Concerns about stormwater runoff pollutants; support for innovative stormwater management including green infrastructure
- Desire for higher levels of wastewater treatment while also wanting lower costs
- Comments urging accelerated sewer separation
- Support for water metering/water conservation



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SUMMARY OF ENGAGEMENT FEEDBACK

Group	What We Heard
Ministry of Environment and Climate Change Strategy	• Better environmental outcomes • Meaningful engagement with First Nations
First Nations	• More decision-making influence • Better environmental outcomes
Public advisory committee	• Healthy habitats for people, fish, and wildlife
Public	• Highest level of treatment regardless of cost • Affordable service

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PHASE 3 ENGAGEMENT

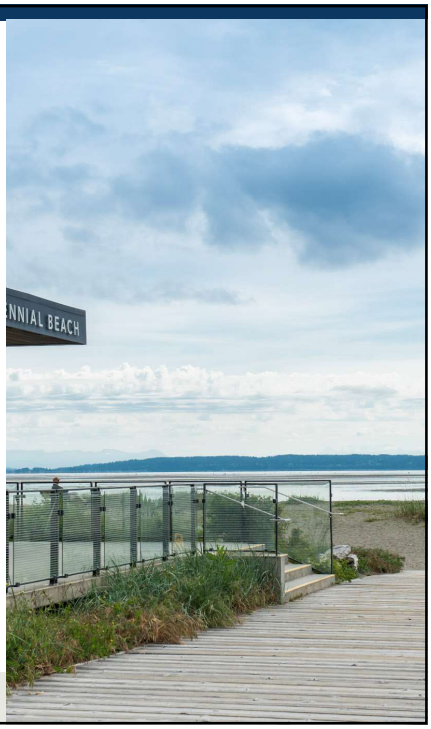
January to March 2025

Share draft plan for comment with:

- 33 First Nations
- Public advisory committee
- Public

Activities:

- Webpage with draft plan and highlighted benefits
- Online public survey and webinar
- Meetings



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Annacis Island Wastewater Treatment Plant

Thank You

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To: Liquid Waste Committee

From: Abin Antony, Program Manager, Utility Planning, Liquid Waste Services

Date: November 5, 2024 Meeting Date: November 13, 2024

Subject: **Endorsement of the Interim Draft Liquid Waste Management Plan**

RECOMMENDATION

That the GVS&DD Board endorse the interim draft Liquid Waste Management Plan and authorize staff to proceed with phase three of the plan's review and update process, as outlined in the report dated November 5, 2024, titled "Endorsement of the Interim Draft Liquid Waste Management Plan".

EXECUTIVE SUMMARY

The Liquid Waste Committee held a special workshop meeting on October 30, 2024 to review draft updates to the Liquid Waste Management Plan (LWMP). Feedback received by the Committee, First Nation delegations, and other stakeholders were considered and adjustments to the Interim Draft Liquid Waste Management Plan (Attachment 1) were made.

Staff seek endorsement on the draft LWMP and approval to proceed to Phase 3, which will include further consultations with municipal councils, First Nations councils, and stakeholders. The final LWMP is scheduled for submission to the provincial Ministry of Environment and Climate Change Strategy in the summer of 2025.

PURPOSE

To seek endorsement of the updated draft Liquid Waste Management Plan presented during the October 30, 2024 workshop, and to request approval to proceed to Phase 3.

BACKGROUND

Over the last three years, Metro Vancouver and its municipal members have been updating the 2011 LWMP, which encompasses both sanitary and rainwater systems. The updates reflect a shift towards reducing demands on the system at the source, ultimately lowering future infrastructure costs and provision of liquid waste services to the region.

The Liquid Waste Committee was engaged in a workshop on October 30, 2024, where the latest version of the updated plan was presented. The feedback was positive, and the workshop participants supported the overall direction of the plan.

DEVELOPMENT OF THE UPDATED LWMP

The updated interim draft LWMP has been developed with extensive input from the Regional Engineers Advisory Committee, Liquid Waste subcommittee and the Stormwater Interagency Liaison Group. The focus has been on reducing system demands through measures such as green

infrastructure and addressing inflow and infiltration, which can cause excess rainwater to enter sanitary systems.

The workshop highlighted the plan's shift away from expanding infrastructure to deal with symptoms of problems and towards addressing the root causes of system deficiencies. The successful engagement with the Liquid Waste Committee during the workshop now allows us to move forward with the next phase of the plan development, which includes further First Nations consultation, engagement with municipal councils, and continual updates to the LWMP as feedback is received through Phase 3, leading to its submission to the Province for review and approval in summer 2025.

ALTERNATIVES

1. That the GVS&DD Board authorize staff to proceed with phase three of the Liquid Waste Management Plan review and update process, as outlined in the report dated November 5, 2024, titled "Endorsement of the Interim Draft Liquid Waste Management Plan".

2. That the GVS&DD Board receive for information the report dated November 5, 2024, titled "Endorsement of the Interim Draft Liquid Waste Management Plan".

FINANCIAL IMPLICATIONS

There are no financial implications.

CONCLUSION

Following the presentation of the updated Interim Draft Liquid Waste Management Plan at the October 30, 2024 workshop, we are seeking the Liquid Waste Committee's endorsement of the plan and approval to proceed to Phase 3. The next phase will involve further consultations with municipal councils, First Nations, and stakeholders before final submission to the Province in 2025.

A draft of the LWMP is included (Attachment 1) for information.

ATTACHMENT

1. Interim Draft Liquid Waste Management Plan (November 2024)

64007008

Interim Draft Liquid Waste Management Plan

November 2024

About Metro Vancouver

Metro Vancouver is a diverse organization that plans for and delivers regional utility services, including water, sewers and wastewater treatment, and solid waste management. It also regulates air quality, plans for urban growth, manages a regional parks system, provides affordable housing, and serves as a regional federation. The organization is a federation of 21 municipalities, one electoral area, and one treaty First Nation located in the region of the same name. The organization is governed by a Board of Directors of elected officials from each member jurisdiction.

Territorial Acknowledgment

Metro Vancouver acknowledges that the region's residents live, work, and learn on the shared territories of many Indigenous peoples, including 10 local First Nations: q̓iċəy̓ (Katzie), q̓ʷɑːn̓ƛ̓ən̓ (Kwantlen), kʷikʷəƛ̓əm (Kwikwetlem), máthxwi (Matsqui), xʷməθkʷəy̓əm (Musqueam), qiqéyt (Qayqayt), Semiahmoo, Sḵwx̱wú7mesh Úxwumixw (Squamish), scəẇaθən məsteyəxʷ (Tsawwassen) and səlilwətaɬ (Tsleil-Waututh).

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

Table of Contents

Co-development of the Liquid Waste Management Plan

Metro Vancouver, as the Greater Vancouver Sewerage and Drainage District (GVS&DD), and its member jurisdictions work together closely to plan and manage wastewater collection and treatment across the region.

The Liquid Waste Management Plan reflects this collaborative relationship. It was co-developed by Metro Vancouver and GVS&DD member jurisdictions between 2021 and 2025, and reflects the priorities and significant contributions of the local governments that will be responsible for implementing the plan.

Metro Vancouver Members

GVS&DD Members

Village of Anmore
City of Burnaby
City of Coquitlam
City of Delta
Electoral Area A
City of Langley
Township of Langley
City of Maple Ridge
City of New Westminster
City of North Vancouver
District of North Vancouver
City of Pitt Meadows
City of Port Coquitlam
City of Port Moody
City of Richmond
City of Surrey
City of Vancouver
District of West Vancouver
City of White Rock

Village of Belcarra
Bowen Island Municipality
Village of Lions Bay
sc̓əw̓aθən məsteyəxʷ (Tsawwassen First Nation)

Introduction

Executive Summary

The purpose of all liquid waste management plans (LWMPs) is to protect public health and the environment. This LWMP includes community-specific solutions for Metro Vancouver and its member jurisdictions to manage wastewater and address growing pressures in the region.

This plan reflects the priorities of communities across the region who shared their perspectives during extensive engagement. It outlines Metro Vancouver's commitment to involve First Nations in wastewater management, and includes new actions developed in collaboration with First Nations governments.

This LWMP lays out a path toward meeting these *Municipal Wastewater Regulation* standards set by the Province:

- **Wastewater treatment.** The Province requires all Metro Vancouver wastewater treatment plants to provide secondary treatment at a minimum. Metro Vancouver plans to upgrade the North Shore and Iona Island wastewater treatment plants to secondary treatment by 2030 and 2040, respectively.
- **Combined sewer overflows.** Provincial policy requires the elimination of all combined sewer overflow systems. The *Municipal Wastewater Regulation* requires reducing the volume of combined sewer overflows from storm or snowmelt events with a less than five-year return period, by an average of 1 per cent per year. Combined sewer overflows will be eliminated by 2050 in the Vancouver Sewerage Area and by 2075 in the Fraser Sewerage Area.
- **Sanitary sewer overflows.** Provincial policy requires reducing the volume of sanitary sewer overflows from storm or snowmelt events with a less than five-year return period, by an average of 10 per cent per year. Metro Vancouver and member jurisdictions are reducing sanitary sewer overflows through actions that keep rainwater and groundwater from entering the sanitary system (inflow and infiltration).

This plan responds to the challenges facing our region – climate change, population growth, affordability, and the impacts of urban development. Many actions focus on reducing the amount of excess rainwater entering the system to avoid costly and unnecessary upsizing of major infrastructure in the future. These actions shift expenditures from Metro Vancouver to member jurisdictions, residents, and businesses, while resulting in a much lower total cost for the region to protect human health and the environment.

New and notable actions in the plan include:

- 1.3 Create master sewer servicing plans to accommodate growth and urban development
- 5.4 Provide incentives to homeowners for replacing private sewer laterals
- 6.4 Review and adjust wet weather sewer pricing
- 8.8 Implement system operational changes to minimize sanitary sewage in combined sewer overflows
- 9.6 Remove flows from creeks, lakes, and underground streams from combined sewers
- 10.2 Involve First Nations in watershed planning
- 11.1 Dedicate municipal budget to rainwater management
- 15.2 Build a regional biosolids dryer

We all have a role to play in protecting our region's waterways. This plan outlines how Metro Vancouver and its member jurisdictions will do their part to achieve our vision of **Healthy Waters. For all. Forever.**

Vision

Healthy Waters

Protect the waters that sustain life and make this region a great place to be

For All

Protect these waters for all life

Forever

Protect these waters for generations to come

Goals

The overarching aim of the plan is to protect public health and the environment by effectively managing liquid waste. The plan also seeks to honour Metro Vancouver's commitment to reconciliation with Indigenous Peoples by actively involving First Nations in regional liquid waste management. This is achieved through five goals:

Prevent pollution

Preventing pollution from entering the environment involves collecting and treating wastewater. Wastewater treatment plants are designed to remove certain substances from sewage. For other substances that would pass through treatment systems, preventing their introduction at the source – i.e., drains and toilets – is the only practical solution. Reliable pollution prevention allows liquid waste infrastructure to be more resilient and prepared for climate change and evolving regulatory requirements.

Reduce demands

Reducing the inputs into the wastewater system – both volume of flow and loading of organic material – enables smaller infrastructure to serve a growing population. Lowering the demands on the system can defer expansions and increase infrastructure resilience, which saves money in the long run and keeps the system affordable.

Recover resources

Recovering valuable resources from wastewater such as biogas, heat, biosolids, nutrients, and reclaimed water supports the return to a cyclical approach to natural resource management. Turning waste into valuable products as part of a circular water economy can reduce dependence on fossil fuels and extraction of raw materials, and improve economic resilience.

Restore ecological systems

Restoring ecological systems involves revitalizing and rehabilitating natural environments that have been degraded or damaged, to return these areas to their natural functioning and improve the ability of habitat to support wildlife.

Reflect First Nations' priorities

This plan aspires to reflect First Nations' priorities and respect Indigenous Knowledge and the rights of Indigenous Peoples while collaborating on areas of shared significance to improve environmental and public health outcomes for all.

These goals are linked to the circular water economy (Figure 1), which is a system where water and wastewater are treated as valuable resources that are sustainably managed to reduce waste and protect water for future needs. There is much to be learned from Indigenous societies and Indigenous ways that predate the colonial imposition of the linear economy in the region.

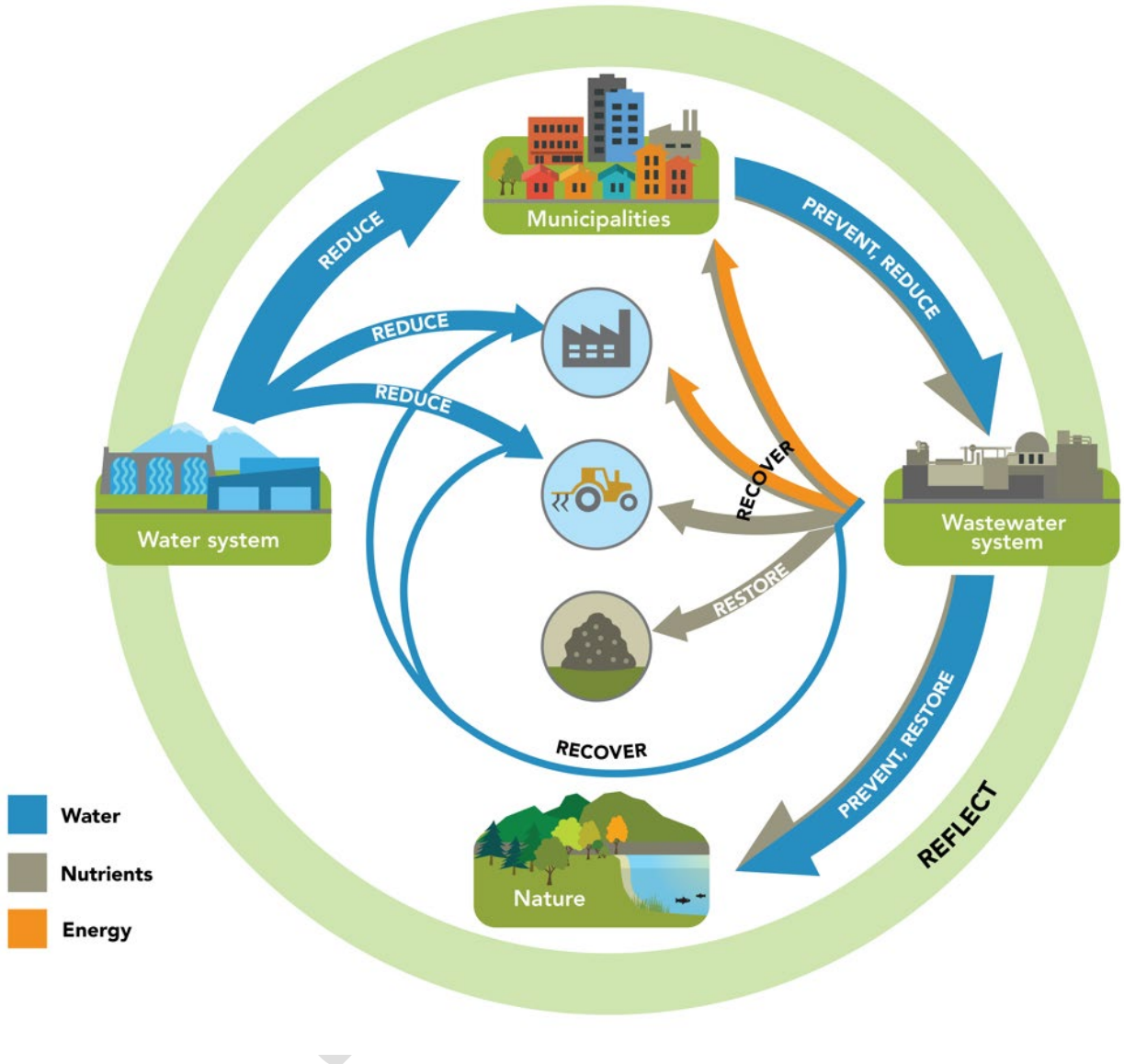


Figure 1 – Circular Water Economy

Plan Context

History

This LWMP has evolved over two decades to address the region's changing priorities and challenges in managing liquid waste.

The 2002 LWMP laid a comprehensive foundation by focusing on key areas such as water quality, combined sewer overflows, wastewater treatment plant upgrades, biosolids management, and source control. Key strategies included water conservation, asset maintenance, and maximizing environmental benefits per dollar spent. The plan emphasized interagency collaboration, continuous monitoring, and biennial reporting to measure progress and ensure environmental compliance. It also set deadlines for secondary treatment at major wastewater treatment plants and required member jurisdictions to develop stormwater management plans.

The 2011 LWMP built on the initial plan with a stronger emphasis on sustainability and resilience. It reset deadlines for secondary treatment and reinforced commitments to eliminating CSOs and sanitary sewer overflows. The plan introduced the Sustainable Region Initiative, focusing on the interconnectedness of local and global impacts, protecting natural and economic capital, and building community capacity. The new vision aimed for the long-term recovery of energy, nutrients, water, and other materials from liquid waste. The plan set three main goals: protecting public health and the environment, using liquid waste as a resource, and ensuring effective, affordable, and collaborative management. Additional performance measures were introduced to track progress toward these goals.

The new LWMP focuses on implementation and tangible results to meet current and future challenges. This plan streamlines initiatives to ensure timely and effective execution of key strategies, reducing complexity and focusing resources on the most impactful actions. It prioritizes adaptive infrastructure and programs to address climate change while continuing to use liquid waste as a valuable resource. The plan strengthens relationships with member jurisdictions, First Nations, the public, and interested parties to deliver reliable and equitable sewer infrastructure. Rigorous performance monitoring and reporting are maintained to track progress and make data-driven adjustments.

The new LWMP supersedes all previous LWMPs. Many of the actions in this LWMP are adapted from the 2002 and 2011 plans. A list of all previous actions and their status can be found in Appendices D and E respectively. Many actions also continue to be aligned with 2002 LWMP Policies while some have been superseded by updated federal or provincial regulations since that time. The 2002 LWMP Policies are listed in Appendix F.

Evolution of Liquid Waste Management in Metro Vancouver

1890s-1910s
Outbreaks of cholera, typhoid fever, and other diseases

1911
Beaches were closed in summer due to sewage pollution

Four municipalities form the Burrard Peninsula Joint Sewerage Commission to build regional sewer system

1913
R.S. Lea Report: first "Master Plan" to direct raw sewage discharges away from beach areas

1914
Vancouver & Districts Joint Sewerage & Drainage Board formed

1910s-1950s
Combined sewers are built despite R.S. Lea Report recommendation to build separated sewers

1953
A.M. Rawn Report: new "Master Plan" developed due to increasing water quality issues

Decision to build interceptors and wastewater treatment plants

1956
Greater Vancouver Sewerage & Drainage District Act establishes four sewerage areas

1961
Lions Gate WWTP opens

1963
Iona Island WWTP opens

1969
Updated A.M. Rawn report recommends treatment plants on Lulu Island and Annacis Island

1973
Lulu Island WWTP opens

1974
Interceptors are completed, ending the discharge of untreated sewage

1975
Annacis Island WWTP opens

1989
Stage 1 LWMP: Desire to further improve receiving water quality and end overflows of untreated sewage

1991
Inception of Metro Vancouver's biosolids beneficial use program

1998-1999
Secondary treatment implemented at Annacis Island WWTP and Lulu Island WWTP as mandated by the Province

1999
Stage 2 LWMP: Sewer separation strategy endorsed to eliminate combined sewer overflows

2001
LWMP establishes deadlines for separating combined sewers and eliminating combined sewer overflows, and sets requirement to eliminate sanitary sewer overflows at chronic sites

2002
Region's first LWMP approved by the Province, with ministerial conditions for future secondary treatment at Iona Island WWTP by 2020 and Lions Gate WWTP by 2030

2011
Increasing sanitary sewer overflows lead to additional actions in updated LWMP to eliminate overflows by addressing inflow and infiltration

Updated LWMP approved by the Province with ministerial conditions for secondary treatment at Lions Gate WWTP by 2020 and Iona Island WWTP by 2030

2010s to present
Efforts to mitigate wet weather flows unable to keep pace with climate change impacts, leading to planned expansions for increasing demand on conveyance and treatment systems

2013
Requirement for annual reporting of combined sewer overflows to federal government

2023
Wet weather cost allocation implemented

2025
Submission of new LWMP to Province for approval

2030
Planned secondary treatment implementation at North Shore WWTP

2035-2040
Planned secondary treatment implementation at Iona WWTP

2050
Planned combined sewer elimination in Vancouver Sewerage Area

2075
Planned combined sewer elimination in Fraser Sewerage Area

1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020 2030 2040 2050 2060 2070 2080

Iona Island Wastewater Treatment Plant

Working Collaboratively with First Nations

Metro Vancouver recognizes and respects that it operates on territory where First Nations have inherent rights, as recognized and affirmed in section 35 of the *Constitution Act, 1982*. In addition, both the governments of Canada and British Columbia have enacted legislation to affirm the application of the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP) to laws within their jurisdiction.

In its preamble, UNDRIP states that "respect for indigenous knowledge, cultures and traditional practices contributes to sustainable and equitable development and proper management of the environment."[1]

As part of our continued reconciliation efforts, Metro Vancouver is committed to meaningful engagement, dialogue, and collaboration with First Nations on our plans, programs, and projects, as outlined in Metro Vancouver's *Board Strategic Plan*, 2022-2026. We also continue to build and strengthen respectful and reciprocal relationships with First Nations, guided by the principles of UNDRIP "as a standard of achievement to be pursued in a spirit of partnership and mutual respect."[2]

Metro Vancouver would like to extend sincere thanks to the First Nations who were able to generously share their time, knowledge, and expertise in the engagement process for updating the LWMP. The opportunity to share and talk together has created learnings that go beyond the development of this plan and will continue to inform Metro Vancouver's work moving forward.

The LWMP seeks to honour the Board's commitment to reconciliation with Indigenous Peoples. The strategies and solutions in the plan reflect key themes heard during engagement with First Nations. The plan:

- Acknowledges that liquid waste management has impacts on First Nations communities and lands
- Outlines a commitment to work with First Nations to increase their influence on the projects and plans that affect their rights and interests
- Recognizes First Nations have an important role in stewardship of the region's land, water, and air
- Seeks to incorporate Indigenous Knowledge and actively involve First Nations in regional liquid waste management

These and other themes discussed with First Nations have been embedded throughout the strategies and actions of the LWMP. Metro Vancouver recognizes that each First Nation is unique, and we seek to work with First Nations individually to determine how best to move forward together. Metro Vancouver looks forward to working in collaboration with First Nations to achieve the goals of the LWMP.

[1] UNDRIP Preamble paragraph 11
[2] UNDRIP Preamble paragraph 24

Governance

The Province allows all local governments to develop and periodically update an LWMP. LWMPs, authorized and regulated through the *Environmental Management Act*, allow local governments to develop community-specific solutions for wastewater management providing a pathway towards meeting or surpassing existing regulations. There is also an opportunity to make mid-plan amendments during the approximately 10-year cycle of the LWMP, should any changes be required.

The Province's primary objectives for LWMPs are to protect public health and the environment and to properly consult the public and First Nations. Local governments are also encouraged to use LWMPs to show innovation and leadership on additional provincial objectives: water conservation, drinking water source protection, resources from waste, energy conservation, climate change adaptation and mitigation, and sustainable financing and asset management.

An LWMP for Metro Vancouver authorizes discharges to the environment — water, air, and land — associated with the management of liquid waste according to the criteria set out in the LWMP and in facility-specific Operational Certificates. Once each LWMP update is approved, it becomes part of local liquid waste regulation through the *Environmental Management Act*. In the absence of an approved LWMP, the provincial *Municipal Wastewater Regulation* governs. Where *Municipal Wastewater Regulation* standards are currently not met, an LWMP will establish a schedule for upgrading substandard facilities.

In addition, the Province has endorsed the Canadian Council of Ministers of the Environment (CCME) *Canada-wide Strategy for the Management of Municipal Wastewater Effluent* (CWS-MMWE). LWMPs should be consistent with the CWS-MMWE, which is designed to provide a harmonized framework to manage municipal wastewater discharges to surface waters with federal discharge criteria.

Roles and Responsibilities

The extent and complexity of the liquid waste systems, with roles and responsibilities being spread between broad levels of governance, require close coordination between all orders of government, businesses, institutions, and residents. This includes and is demonstrated by senior government cost sharing for major capital projects that benefit and support their mandates and regulations. The following entities have key roles and responsibilities in implementing this plan:

Federal government

- Environment and Climate Change Canada: regulates pollutants and protects species at risk
- Fisheries and Oceans Canada: mandated to protect fish populations and habitat in receiving waters and urban streams
- Housing, Infrastructure and Communities Canada: provides and administers infrastructure co-funding for local government projects

Provincial government

- Ministry of Environment and Climate Change Strategy: regulates discharges to the environment, regulates liquid waste, and approves LWMPs
- Ministry of Municipal Affairs: enables infrastructure financing and provides co-funding to local governments for civic projects
- Ministry of Health: regulates on-site wastewater treatment systems (such as septic tanks) and protects public health if sewage spills or if water quality becomes unsafe for recreation

Member jurisdictions

- Member jurisdictions of the Greater Vancouver Sewerage and Drainage District (GVS&DD): own and maintain collector sewers, implement member actions set out in the regional plan, manage rainwater in urban and rural watersheds, report on their progress on actions required in the plan, and establish local land use plans and community development standards

Metro Vancouver

- Metro Vancouver, as the GVS&DD: owns, maintains and operates regional trunk sewers and major wastewater treatment plants, regulates significant industrial discharges to sanitary sewers, implements required regional actions in its plans, reports on plan progress, and collaborates with others as appropriate

First Nations

- As stewards of water and land, First Nations have the right to work with all orders of government to advance improvements to regional water quality, to achieve environmental, cultural, spiritual, and economic goals for their communities, and to protect the health of all marine life

The Public

- Residents, businesses, institutions, and Crown corporations: own and maintain private property sewer connections and private stormwater management systems

Scope of the Plan

While the plan covers the geographic area of Metro Vancouver (Figure 2), the majority of its actions are specific to Metro Vancouver's wastewater collection and treatment systems, and the users connected to these systems, including municipalities, businesses, and residents. In addition, the plan sets specific actions for GVS&DD members in managing stormwater runoff. All actions outlined in the plan apply to the GVS&DD and its members.

Liquid waste management from sources such as on-site treatment and septic systems, agricultural runoff, and marine pump-out facilities for pleasure craft involves multiple jurisdictions. While the LWMP addresses these areas through collaboration with other government agencies and other parties, it excludes aspects regulated outside the Ministry of Environment and Climate Change Strategy, such as private septic systems governed by the Ministry of Health and marine pollution overseen by federal authorities.

Figure 2 – The Four Sewerage Areas of the Metro Vancouver Regional Liquid Waste System

Alignment and Linkages

Aligning with National Initiatives

Metro Vancouver and its members actively participated with the Canadian Council of Ministers of the Environment (CCME) to develop the *Canada-wide Strategy for the Management of Municipal Wastewater Effluent* (CWS-MMWE) endorsed by the CCME in February 2009 and implemented in British Columbia by the Ministry of Environment in 2012.

Through the strategy, governments have sought to develop a consistent approach to managing wastewater across Canada that is protective of human health and the environment. The CWS-MMWE sets baseline wastewater management criteria, timelines and prioritization methodologies, and formalizes processes to assess environmental risk.

Arising from recommendations that were part of CWS-MMWE, *Wastewater Systems Effluent Regulations* to manage wastewater releases came into force in June 2012 under the *Fisheries Act*. *Wastewater Systems Effluent Regulations* set national baseline effluent quality standards that are achievable through secondary wastewater treatment and prohibit the discharge of effluent that is acutely lethal to rainbow trout. The regulations also specify requirements for carrying out effluent monitoring, reporting, and record keeping, and require owners or operators of wastewater systems with combined sewers to submit an annual report on the total volume and the number of days that wastewater is discharged per month via combined sewer overflow (CSO) points as a result of precipitation.

In addition to the *Fisheries Act*, the *Canadian Environmental Protection Act* is also used to prevent and manage risks posed by toxic and harmful substance. This legal framework may contribute to improved wastewater effluents by controlling substances that are otherwise difficult to treat. Under the *Canadian Environmental Protection Act*, owners or operators of wastewater treatment facilities that meet reporting requirements are required to report discharges to the National Pollutant Release Inventory.

Aligning with Provincial Initiatives

The goals, strategies, and actions have been aligned with provincial policies and positions to ensure that Metro Vancouver's and the Province's environmental and fiscal objectives and actions are mutually supportive and successful. Key plans and initiatives supported by this plan include:

- ***Environmental Management Act*** — ***Municipal Wastewater Regulation (2022)***. As noted previously, where Municipal Wastewater Regulation standards are currently not met, the LWMP establishes a roadmap towards compliance.
- ***Resources from Waste: A Guide to Integrated Resource Recovery (2009)*** — Guidebook on integrated resource recovery approach for local governments to maximize the environmental, social, and economic benefits of recovering waste resources generated by infrastructure through planning and management.
- ***CleanBC Roadmap to 2030 (2021)*** — The Province's plan to reach climate targets and continue on a path to net-zero emissions by 2050.

- ***Preparing for Climate Change: An Implementation Guide for Local Governments in British Columbia (2012)*** — Guide to assist local government elected officials and staff, including planners, engineers, chief administrative officers, financial officers, and others, to plan and act in ways that will make their communities more resilient to the impacts of climate change.
- ***BC Climate Action Charter (2007)*** — Under the Charter, local government signatories commit to becoming carbon neutral in their corporate operations, measuring and reporting their community's greenhouse gas emissions, and creating complete, compact, more energy efficient communities.
- ***BC Clean Energy Strategy (2024)*** — Outlines actions in 10 focus areas to accelerate the shift to made-in-British Columbia clean energy and achieve net zero emissions by 2050.
- ***BC Coastal Marine Strategy (2024)*** – Establishes the Province's first shared vision for the British Columbia coast that was co-developed with many First Nations from the coast, with goals for healthy coastal marine ecosystems, resilience to climate change, thriving coastal economies and communities, and informed governance.

Linkages with other Metro Vancouver plans

There is interdependence between the goals, strategies and actions in this plan and those in other regional plans.

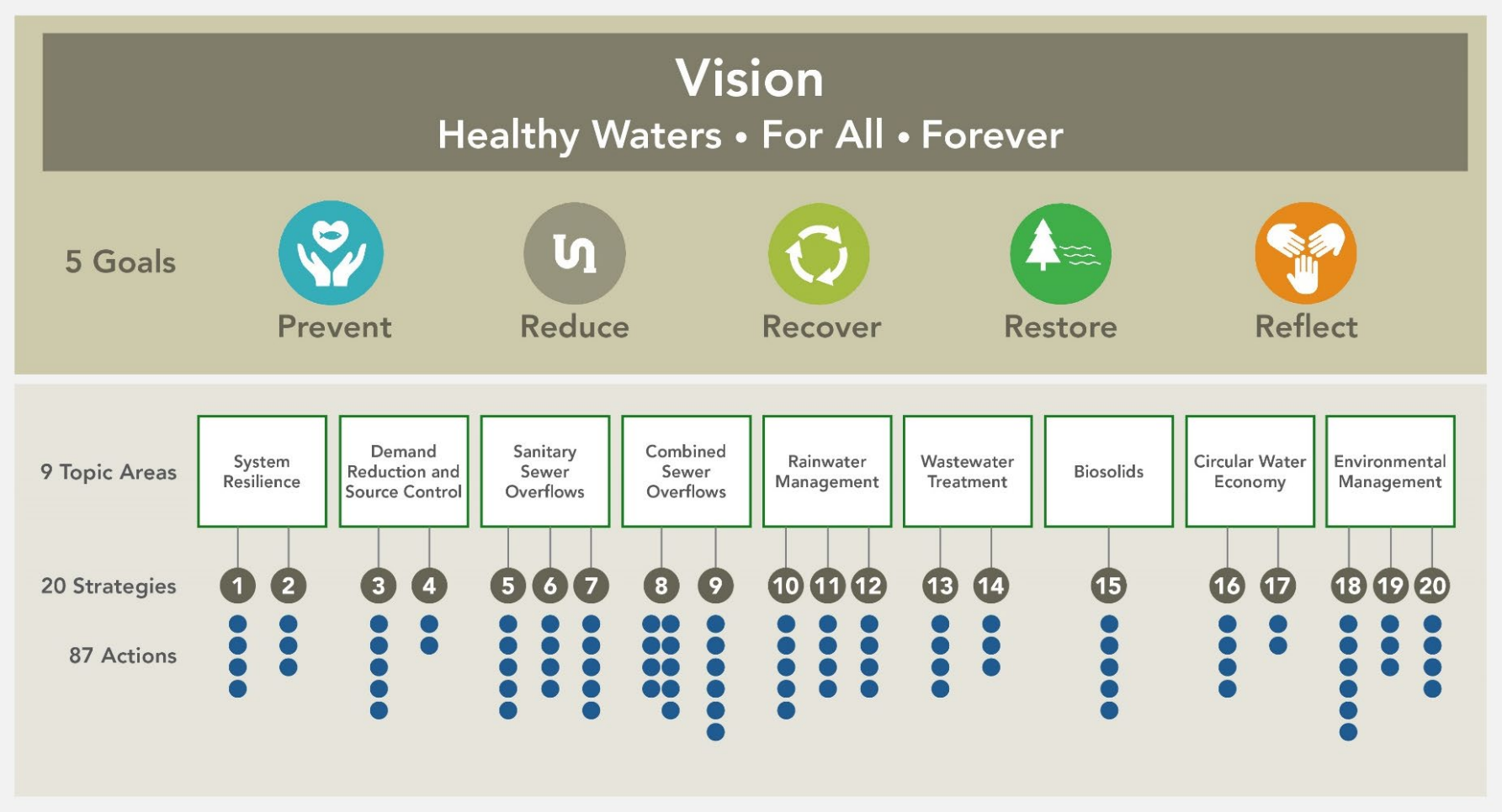
- ***Board Strategic Plan (2022-2026)*** — Annual work plans are prepared for Metro Vancouver's service areas that respond to the directions of the *Board Strategic Plan*. These work plans include high-level performance indicators that have been developed across the organization to evaluate trends, determine key actions for the coming year, and assist in long-term planning.
- ***Drinking Water Management Plan (2011)*** — An overarching plan for Metro Vancouver and its member jurisdictions, which sets the direction and priority for regional drinking water initiatives. This plan has three goals: provide high-quality drinking water; ensure the sustainable use of water resources; and ensure the efficient supply of water.
- ***Integrated Solid Waste and Resource Management Plan (2010)*** — Metro Vancouver's sustainability principles provide guidance for the regional solid waste plan. For Metro Vancouver, sustainability means tying together environmental, social, and economic interests. For managing solid waste this translates into protecting the receiving environment (air, land, and water).
- ***Metro 2050: Regional Growth Strategy (2022)*** — The region's collective vision for how growth will be managed to support the creation of complete, connected, and resilient communities, while protecting important lands and supporting the efficient provision of urban infrastructure like transit and utilities.
- ***Climate 2050 (2018-2019)*** — Metro Vancouver's *Climate 2050* strategy will guide climate change policy and action for Metro Vancouver for the next 30 years. *Climate 2050* prioritizes climate action in the region.
- ***Clean Air Plan (2021)*** — A plan for managing air quality and greenhouse gases over the next 10 years. The *Clean Air Plan* includes key actions to effectively reduce greenhouse gas emissions in this region, in pursuit of 2030 emissions targets. The regional *Clean Air Plan* aligns with the Province's *CleanBC Roadmap to 2030*, and represents a coordinated approach from local governments across the Metro Vancouver region. The *Clean Air Plan* includes significant next steps in moving towards regional carbon neutrality by 2050.

- ***Regional Greenways 2050 (2020)*** — The expansion of the greenway network provides opportunities to promote ecosystem connectivity by protecting some of the region's remaining natural areas, integrating green infrastructure, and increasing regional tree canopy cover.

Strategies and Actions

Snapshot

The five goals provide direction for the strategies in the plan. The strategies are grouped under nine topic areas that encompass liquid waste management from source to system to sea.



The following table shows how each of the plan's strategies contribute to the five goals.

	Prevent	Reduce	Recover	Restore	Reflect
System Resilience					
Strategy 1: Ensure system can serve a growing population in a changing climate					
Strategy 2: Improve resilience of wastewater system to climate change and natural hazards					
Demand Reduction and Source Control					
Strategy 3: Reduce flows and loadings into the system					
Strategy 4: Prevent pollution at the source					
Sanitary Sewer Overflows					
Strategy 5: Reduce excess rainwater entering into private lateral sewers					
Strategy 6: Enhance transparency and accountability for reducing inflow and infiltration					
Strategy 7: Minimize impacts of sanitary sewer overflows on human health and environment					
Combined Sewer Overflows					
Strategy 8: Assess impact of combined sewer overflows on receiving environment					
Strategy 9: Separate combined sewers to eliminate overflows					
Rainwater Management					
Strategy 10: Manage rainwater and urban development for watershed health					
Strategy 11: Update and harmonize municipal tools for rainwater management					
Strategy 12: Enhance interagency collaboration to improve watershed health across the region					

	Prevent	Reduce	Recover	Restore	Reflect
Wastewater Treatment					
Strategy 13: Treat wastewater so effluent meets or surpasses regulatory requirements					
Strategy 14: Operate and maintain wastewater treatment plants to meet or surpass regulatory requirements					
Biosolids					
Strategy 15: Diversify options to beneficially use Nutrifor biosolids					
Circular Water Economy					
Strategy 16: Implement proven resource recovery technologies					
Strategy 17: Research and pilot innovative technologies to advance the circular water economy					
Environmental Management					
Strategy 18: Minimize impacts of liquid waste management on the atmosphere and air quality					
Strategy 19: Environmental monitoring to protect public health and the environment					
Strategy 20: Collaborate on regional environmental management initiatives					

System Resilience

Metro Vancouver and its members collect and treat wastewater in the region as a fundamental local government function to protect human health and the environment. Population growth, changes to land use, and a changing climate all increase the volume of liquid waste and can strain existing infrastructure. Proactive planning is needed to ensure that the collection, conveyance and treatment systems can accommodate growth, extreme weather events, and rising water levels, since replacement and expansion of infrastructure takes decades.

Metro Vancouver and members update regional and municipal population projections on a regular basis to guide land use and infrastructure planning. The figure below shows three growth scenarios that capture varying assumptions about an uncertain future. The medium-growth scenario is considered to have the highest probability. The region is expected to grow by nearly 50,000 net new residents annually. As a result, the region's population is projected to reach 4 million by the mid-2040s.

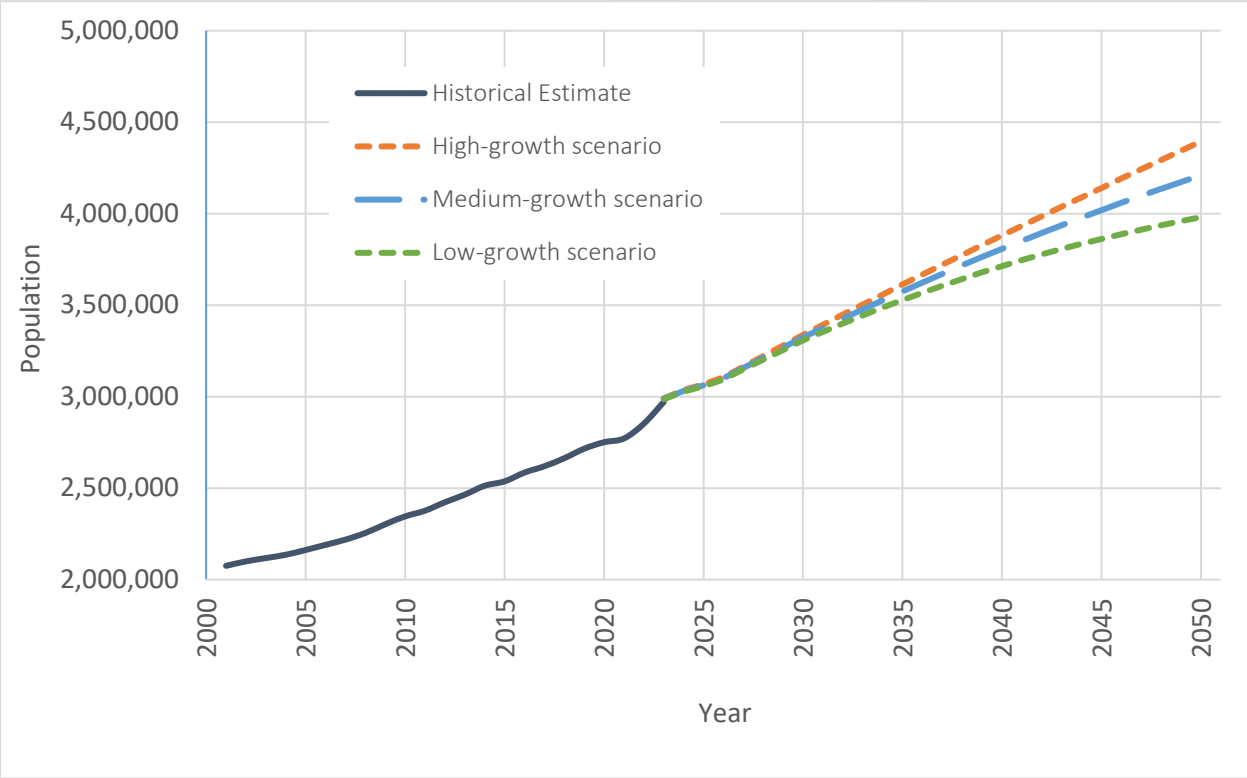


Figure 3 – Metro Vancouver population growth and projections from 2000 to 2050

Strategy 1 Ensure system can serve a growing population in a changing climate

In a region with a growing population, strong economy, constrained land base, and a changing climate, proactive planning for the provision of sanitary collection and treatment services is necessary. Asset management plans will be critical to ensure our infrastructure assets are properly maintained, repaired, replaced, and upgraded to minimize lifecycle costs while delivering the required level of service. Master Sewer Servicing Plans establish and assess existing sewer service levels, incorporate future growth and development forecasts, evaluate alternative solutions to maintain or enhance current service levels, include opportunities for feedback from those involved and affected, and provide an implementation roadmap. These plans serve as a vital tool to guide land use decisions, infrastructure planning, and budget allocation for municipal decision-makers to ensure wastewater infrastructure is adequate to support current and future growth and are aligned with regional goals and objectives.

Supports Goals: Prevent pollution, Reflect First Nations' priorities

Actions

1.1 Metro Vancouver and members will maintain the condition and performance of the sewerage system to serve a growing population in a changing climate by:

a) inspecting sanitary sewers on a 20-year cycle;

b) maintaining current maps of sewerage inspection, condition, and repairs; and

c) continuing to develop and implement asset management plans that address risks, including climate change and seismic events, and target a 100-year replacement or rehabilitation cycle for sewerage infrastructure.

Metro Vancouver will use the National Association of Sewer Service Companies' Pipeline Assessment Certification Program and Manhole Assessment Certification Program for (a) and (b). Members are encouraged to use these programs for (a) and (b) to ensure a consistent approach.

Timeline: ongoing
Adapted from: C19, 1.3.1, 1.3.11, 3.1.1, 3.1.4, 3.1.5, 3.1.6, 3.1.7, 3.1.8
Aligned with: P8

1.2 Members and Metro Vancouver will seek to accommodate population growth and land use changes:

- Members will provide local collector sanitary sewer capacity for peak dry weather flow plus an inflow and infiltration allowance of 11,200 L/ha/d on average at point of connection to Metro Vancouver infrastructure, to ensure hydraulic grade lines stay within safe operating levels.
- Metro Vancouver will provide regional trunk sanitary sewer capacity and wastewater treatment plant hydraulic capacity for peak dry weather flow plus an inflow and infiltration allowance of 11,200 L/ha/d, to ensure hydraulic grade lines stay within safe operating levels.

Note, the inflow and infiltration allowance of 11,200 L/ha/d corresponds to storms with return period of less than five years.

Timeline: ongoing
Adapted from: C19, 1.3.2, 3.1.3, 3.1.7
Aligned with: P8, P9

1.3 Metro Vancouver and members will create and update Master Sewer Servicing Plans to accommodate growth and urban development:

a) Metro Vancouver in collaboration with members will develop a framework for creating and updating Master Sewer Servicing Plans. At a minimum, the framework will identify required content and deliverables, deadlines, and the frequency of updates.

b) Metro Vancouver and members will create or update Master Sewer Servicing Plans in accordance with the framework. Metro Vancouver and members will continue to ensure that First Nations are engaged appropriately.

Timeline: (a) within three years; (b) as determined in (a)
New action; engagement with First Nations continuing per 2011 MC10.

1.4 Metro Vancouver and members' provision of liquid waste infrastructure and services will be consistent with the Regional Growth Strategy and coordinated with municipal Official Community Plans.
Timeline: ongoing
Adapted from: 3.4.3, 3.4.6

Performance Indicators

1A Percentage of sanitary sewer pipe inspected annually
Responsibility: Metro Vancouver and members
Replaces 2011 performance measure: metres of sewer pipe inspected and renewed annually

Strategy 2 Improve resilience of wastewater system to climate change and natural hazards

Most wastewater and rainwater infrastructure was not originally designed with climate change in mind. Wastewater infrastructure in the region is expected to face a range of hazards from climate change, including rising water levels, more extreme rainfall events, longer dry spells in summer, and increased precipitation in other seasons, among others. Climate change impacts and other natural hazards like earthquakes must be considered during design and upgrades of infrastructure to avoid creating vulnerabilities that make climate change adaptation more difficult and expensive for future generations. Metro Vancouver and members have been taking action to prepare for climate change impacts for well over a decade, and will continue to design, build, and operate more resilient and adaptable systems.

Supports Goals: Prevent pollution, Reflect First Nations' priorities

Actions

2.1 Metro Vancouver and members will collaborate with other jurisdictions and organizations to share climate data and to regularly update regional climate projections, to improve understanding of the future climate for infrastructure planning.
Timeline: ongoing
New action

2.2 Metro Vancouver will conduct climate change and natural hazard vulnerability assessments and will prepare adaptation plans for Metro Vancouver infrastructure, assets, and operations in each sewerage area to enhance resilience to future climate conditions.
Timeline: begin within one year
New action

2.3 Metro Vancouver and members will continue to plan, locate, design, and adapt infrastructure, assets, and operations to address identified hazards, risks, and vulnerabilities, including climate change impacts.
Timeline: ongoing
Adapted from: 1.3.1, 1.3.11, 3.4.1, 3.4.5

Performance Indicators

None proposed for this strategy.

Demand Reduction and Source Control

Wastewater treatment and conveyance infrastructure are critical assets for the region that require billions of dollars in investments to construct, operate, maintain, and upgrade. Reducing demands on the system involves encouraging households, businesses, and industries to reduce flows and loads to the sewer system, which reduces operational costs and can defer the need for costly infrastructure expansions. Shifting behaviours towards more sustainable practices requires effective education and incentives. Source control, which reduces loadings and prevents the introduction of contaminants into the sewage system, is often more effective and less costly than treatment. Source control is critical to address harmful substances that are difficult to treat, to prevent them from impacting the water quality of receiving environments.

Strategy 3 Reduce flows and loadings into the system

Wastewater flow and organics loading are the main drivers for designing and sizing wastewater treatment plant upgrades and expansions, as well as dictating day-to-day operational needs and affecting system performance. Larger flows and loadings mean the need to build larger and costlier infrastructure. The amount of wastewater produced by users also affects the capacity of the collection system to accommodate growth, wet weather, and the consequences of climate change.

Residential, commercial, and industrial users all have a role to play in improving the quantity and quality of the wastewater they produce. Metro Vancouver and members will assess and implement demand side management actions that help extend the useful life of existing facilities, defer expansion, and prevent system overflows, while reducing costs for the region. Identifying the best opportunities for reduction and implementing multi-pronged approaches tailored to each sector will help the regional wastewater system run as efficiently as possible.

The actions in this strategy reduce dry weather flow (i.e., flows from inside buildings) and organics loading. Strategies and actions to reduce wet weather flow (i.e., inflow and infiltration) are described in Strategies 5 and 6 in the Sanitary Sewer Overflows section.

Supports Goals: Prevent pollution, Reduce demands

Actions

3.1 Metro Vancouver will pursue reductions in residential wastewater flow and loading through improving education and awareness, starting with discouraging disposal of food waste down drains, by encouraging reduction of food waste in general and encouraging use of green bins for kitchen scraps. Members will provide input and assist with implementation.
Timeline: within two years
Adapted from: C28, C29, 1.1.4, 1.1.5, 1.1.17

3.2 Metro Vancouver will pursue reductions in commercial wastewater flow and loading through collaboration with businesses, starting with working with restaurants to improve grease interceptor maintenance practices, to prevent introduction of grease into the sewer system. Members will provide input and assist with implementation.
Timeline: within three years
Adapted from: C28
Aligned with: P15

3.3 Metro Vancouver will pursue reductions in industrial wastewater flow and loading, starting with updating fees in bylaws to create financial incentives that motivate industries to minimize their wastewater discharges.
Timeline: within five years
Adapted from: C25, C28, 1.1.1
Aligned with: P17, P20

3.4 Metro Vancouver will work with members to prevent the introduction of fats, oils, and grease into the system.

a) Metro Vancouver will improve monitoring and coordination with members to address fats, oils, and grease hot spots in the region.
b) Metro Vancouver will improve grease interceptor requirements for high grease producing restaurants within Metro Vancouver's *Food Sector Grease Interceptor Bylaw*.
c) Metro Vancouver will provide guidance to enable members to manage fats, oils, and grease through their own bylaws.

Timeline: within two years
Adapted from: C28, 1.1.14

3.5 a) Member jurisdictions 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.
b) Metro Vancouver, in partnership with member jurisdictions, is encouraged to pursue a region-wide water conservation program targeting the industrial, commercial, institutional and agricultural sectors as part of its updated *Drinking Water Management Plan*. Remaining municipalities in the region that have not implemented metering for these sectors are encouraged to do so.

Timeline: a) ongoing; b) Drinking Water Management Plan anticipated to be ready for Board endorsement by 2026.
Adapted from: C28, C32, 2011 MC2, 2011 MC3, 1.1.13
Aligned with: P19

Performance Indicator

3A Per capita average dry weather flow [L/person/day], total influent Biochemical Oxygen Demand (BOD) [g/person/day], and total influent Total Suspended Solids (TSS) [g/person/day], at each wastewater treatment plant.

Responsibility: Metro Vancouver
New indicator

Low-flow water fixtures reduce wastewater flows

Plumbing code updates in the 1990s and 2000s have successively decreased the maximum flow rates of faucets, showerheads, toilets and urinals. The introduction of low-flow water fixtures has reduced per capita drinking water consumption in the region. Since wastewater comes from drinking water that people put down drains and toilets, this has resulted in decreasing per capita wastewater flows, as shown in Figure 4 below.

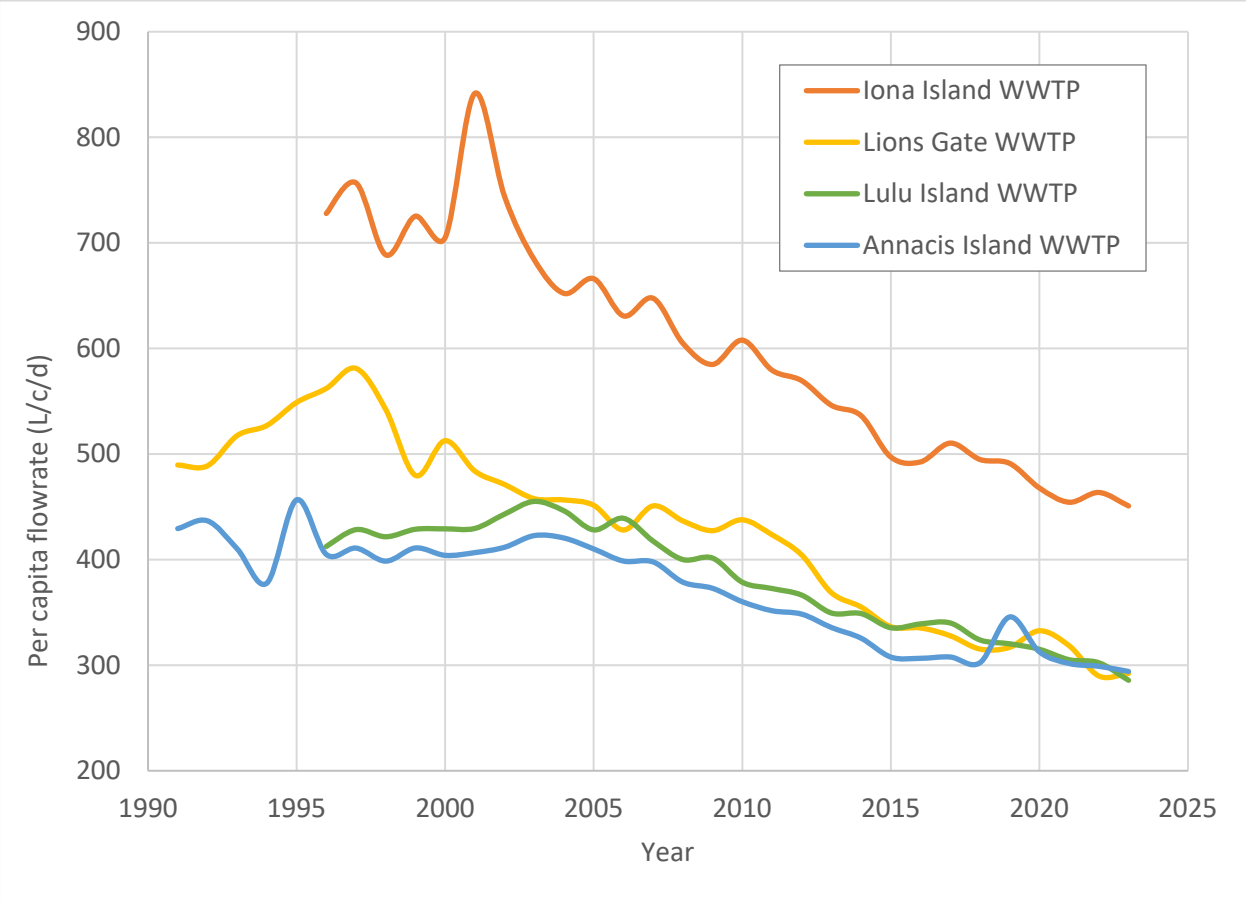


Figure 4 – Wastewater flows into Metro Vancouver wastewater treatment plants 1990 to 2023

The downward trend of wastewater flow means higher populations can be served by existing infrastructure and helps preserve system capacity for additional growth, deferring the requirement for costly expansions.

Strategy 4 Prevent pollution at the source

Metro Vancouver's source control program uses a suite of tools that include regulations and bylaws, education, community outreach, and advocacy for increased regulations. Examples of past and ongoing source control efforts include updating the sewer use bylaw to reflect the most recent scientific and technical information and best practices, the "Unflushables" campaign educating residents about items that should not be flushed, guides that communicate best wastewater management practices for various commercial and industrial sectors, and "Our Ocean Thanks You" campaign targeting reduction of microfibers in laundry. Through this strategy, the source control program will continue to prevent pollution from different sectors — residential, commercial, and industrial — in the region.

Supports Goals: Prevent pollution, Reflect First Nations' priorities

Actions

4.1 Metro Vancouver will prioritize contaminants for source control using the Canadian Council of Ministers of Environment (CCME) *Canada-wide Strategy for Management of Municipal Wastewater Effluent* (CWS-MMWE) Environmental Risk Management Framework. Metro Vancouver will take further source control actions such as educating target sectors to reduce their discharges to sewers, advocating for increased provincial and federal regulations on the manufacturing and use of products with contaminants, and updating Metro Vancouver's bylaws for industrial and commercial dischargers. Metro Vancouver will work with First Nations that choose to participate on advocating for increased provincial and federal regulations on the manufacturing and use of products with contaminants.

Timeline: ongoing
Adapted from: C25, C33, 2011 MC5, 2011 MC10, 1.1.1
Aligned with: P15

4.2 Metro Vancouver and members will continue to motivate residents and businesses to prevent pollution at the source by properly managing what they send down drains and toilets.

a) Metro Vancouver will continue outreach programs that include youth education programs.
b) Members will continue to promote and support Metro Vancouver's regional outreach and education efforts.
c) Metro Vancouver will work with First Nations as desired on such outreach and education.

Timeline: ongoing
Adapted from: C29, 2011 MC10, 1.1.5, 1.1.17
Aligned with: P15

Performance Indicators

None proposed for this strategy.

Sanitary Sewer Overflows

Sanitary sewers collect wastewater from toilets and drains in homes and businesses, and carry it to wastewater treatment plants for processing before being released into the environment. A sewer overflow occurs when wastewater is discharged directly into the environment — usually the nearest water body, or sometimes onto land — instead of being processed at a wastewater treatment plant. Overflows from sanitary sewers can happen when heavy rainfall overloads the sewer system, in both municipal and regional sewer systems. Metro Vancouver reports sanitary sewer overflows immediately to the federal and provincial governments, regional health authorities, the First Nations Health Authority, and associated municipalities.

Metro Vancouver and members are working to identify neighbourhoods where damaged pipes and improperly connected roof and foundation drains let in rainwater and groundwater that does not belong in sanitary sewers. This inflow and infiltration occurring on individual properties can add up to create serious challenges downstream: it contributes to sanitary sewer overflows, sewer backups and basement flooding in private property, and greatly increases the volume that must be processed at wastewater treatment plants.

Private lateral sewers connect homes, business, and institutions to the municipal and regional systems, and account for about half of the estimated 15,000 km of sewers in the region. While public sewers have ongoing maintenance programs, private lateral sewers have not been part of any comprehensive strategy. Previous construction of storage facilities and capacity upgrades have partially mitigated risks to the environment with additional facilities currently scheduled in Metro Vancouver's long range plan. However, continually building larger infrastructure to accommodate leaky pipes is financially unsustainable and has not achieved the elimination of sanitary sewer overflows. Reducing inflow and infiltration through inspection, maintenance, and repair of all sewers with particular focus on private lateral sewers as part of regular maintenance cycles and redevelopment over the coming decades will eliminate overflows.

Sanitary Sewer Overflow Storage Tanks

The conveyance capacity of sewers and pump stations can be exceeded during substantial rain storms due to leaky sewers allowing rainwater into the system. Storage tanks can be used to temporarily hold excess flow that cannot be completely conveyed during significant wet weather events, which is then pumped back into the conveyance system after the storm. This can prevent the occurrence of sanitary sewer overflows in areas with high inflow and infiltration. To date, storage tanks have been constructed in Surrey and Maple Ridge, and another is planned for North Surrey at a cost approaching $100 million.

Continuing with the current approach would require 15 to 20 more storage tanks over the next three decades. While storage tanks offer temporary relief from overflows, they only address the symptom of the problem. A better solution is to address the root cause of overflows – leaky sewers and improperly connected roof or foundation drains. Reducing the entry of excess rainwater into sewers at the source will prevent overflows and result in a system that is more resilient against large storm events.

Cloverdale Sanitary Sewer Overflow Storage Tank under construction in Surrey

Strategy 5 Reduce excess rainwater entering into private lateral sewers

Studies show that over half of all inflow and infiltration originates on private property. Improving the water-tightness of lateral sewers and ensuring that roof and foundation drains are not improperly connected to sanitary sewers reduces the amount of excess rainwater and groundwater entering the sanitary sewer system. Keeping additional water out of sanitary sewers helps retain the capacity of existing infrastructure to convey and treat sewage from a growing population, leading to lower costs for infrastructure expansions.

Building on previous plans, Metro Vancouver will strengthen actions to reduce rainfall-derived inflow and infiltration from lateral sewers on private properties by addressing potential problems throughout their lifecycle. Actions at the time of construction, through the useful lifespan, and at times of replacement will help ensure that laterals are watertight.

Supports Goals: Reduce demands

Actions

5.1 Metro Vancouver and members will conduct public education and outreach on the relationship between inflow and infiltration and efficient liquid waste management, showing that investing in water-tight private laterals is an effective demand side management strategy that can reduce regional infrastructure costs.
Timeline: within two years
New action

5.2 Members will require inspection, testing, repair and/or replacement of private laterals when new construction or redevelopment occurs:

a) Metro Vancouver will draft sample bylaw wording for members to use to require repair or replacement of private laterals at the time of new construction or redevelopment.

b) Members will develop and implement processes for inspections during construction of new homes and buildings to inspect the section of the lateral between the building and the sewer that can be exposed during construction.

c) Members and Metro Vancouver will advocate to other levels of government for support and changes to building codes that will facilitate these processes.

Timeline: within three years
Adapted from: C28, 1.1.7

5.3 Members will conduct inspections of private laterals in existing properties:

a) Members in coordination with Metro Vancouver will determine which areas have the highest inflow and infiltration and will prioritize those areas for inspection.

b) Members will develop a standardized method for gaining access to properties and for inspecting connections to laterals and condition of laterals on properties with existing buildings.

c) Members will conduct inspections of existing buildings' connections to laterals and condition of laterals in those priority areas identified under (a).

Timeline: begin conducting inspections within five years
Adapted from: C28, 1.1.7

5.4 Members in coordination with Metro Vancouver will develop programs to provide incentives or funding assistance to qualified property owners for rehabilitation of leaky private laterals.

a) Metro Vancouver will explore and analyze various approaches for incentives or funding assistance for members to consider.

b) Members may then develop programs tailored to their specific needs and capacities to provide incentives or funding assistance to qualified property owners.

Timeline: develop programs within two years; provide funding within four years
New action

5.5 Members will direct staff and officers to enforce bylaws on private property, using existing legal authority and/or via proposing any necessary amendments to bylaws, to prevent the unauthorized discharge of rainwater and groundwater to sanitary sewers, through the issuance of notices of bylaw violation, municipal ticket information, prosecution, and/or requirements for remedial action, for properties where either of the following conditions are not met:

- roof and foundation drain connections are properly configured to not direct rainwater to sanitary laterals, or
- sanitary laterals are in good condition and watertight.

Timeline: within five years
Adapted from: C28, 1.1.7, 1.1.19

Performance Indicators

5A Peak wet weather flow, average dry weather flow, and ratio of peak wet weather flow to average dry weather flow at key regional monitoring points and at wastewater treatment plants

Responsibility: Metro Vancouver
Replaces 2011 performance measures: wet weather peaking factors at key regional monitoring points; average [24 hour] flows at regional flow monitoring stations and at wastewater treatment plants

Strategy 6 Enhance transparency and accountability for reducing inflow and infiltration

Reducing inflow and infiltration is a gradual process that involves action by all concerned. Interim targets for progressive reductions can help motivate and track action while gradually moving towards long-term targets. Meaningfulness of reporting will be improved by using metrics that capture both actions taken and how the system performs in wet weather. Increased frequency of reporting will spur Metro Vancouver and members to update and accelerate actions if observed progress is slow.

A measure to gauge demands on the system from excess rainwater is by tracking municipal sewer levies that are tied to wet weather flows. In 2024 Metro Vancouver introduced wet weather sewer pricing that is being phased in over 10 years. Member jurisdictions pay fees that reflect the sewer capacity they use during wet weather. This user-pay approach means that communities with higher inflow and infiltration contribute more toward the regional sewer system. The goal of wet weather sewer pricing is for every community to pay for the amount of water they send through the sewer system. It also aims to ensure that the region is investing in expanding sewer and treatment capacity only when needed to accommodate population growth, and not to address lack of infrastructure maintenance.

Supports Goals: Reduce demands

Actions

6.1 Members will complete inflow and infiltration management plans:

a) Members in coordination with Metro Vancouver will set new interim targets for progressive inflow and infiltration reduction.

b) Metro Vancouver and members will collaboratively develop a consistent inflow and infiltration dashboard with standardized metrics and will incorporate it into the inflow and infiltration management plan template.

c) Members will complete inflow and infiltration management plans, based on the updated template, that include the new interim inflow and infiltration reduction targets.

Timeline: (a), (b) within three years; (c) within five years
Adapted from: C23, 1.1.6, 1.1.8, 1.1.18

6.2 Members will use the inflow and infiltration dashboard to track progress in reducing inflow and infiltration:

a) Members will publicly report their inflow and infiltration dashboard data annually.

b) The public reporting will also include a summary of the results of inspections of sewer laterals in Actions 5.3 and 5.4, and of the enforcement actions and outcomes in Action 5.5.

c) Members and Metro Vancouver will review progress in reducing inflow and infiltration by evaluating trends in their dashboard metrics every four years.

Timeline: (a), (b) within three years; (c) every four years thereafter
Adapted from: C23, 1.1.10

6.3 Members will monitor municipal sewer flows and levels in their existing network to inform their inflow and infiltration dashboards. Members will expand the monitoring network if needed to better understand where inflow and infiltration is happening.
Timeline: ongoing
Adapted from: 3.3.3, 3.3.8

6.4 Metro Vancouver will review the wet weather sewer pricing formula every four years, and will adjust it if needed to further incentivize inflow and infiltration reductions by members.
Timeline: every four years, starting in 2028
Adapted from: 3.1.2, 3.1.7

Performance Indicators

Performance indicators will be reported by members through the new inflow and infiltration dashboards developed in 6.1 and 6.2.

Wet Weather Pricing

The Greater Vancouver Sewerage and Drainage District (GVS&DD) has four distinct sewerage areas as follows: i) North Shore Sewerage Area, ii) Vancouver Sewerage Area, iii) Fraser Sewerage Area, iv) Lulu Island Sewerage Area (see Figure 2). The apportionment of expenditures within each sewerage area are determined in accordance to the *Cost Apportionment Bylaw* that defines a number of cost categories.

For costs to be apportioned within a given sewerage area, the formulation has historically been based on dry weather flows (or a proxy thereof) generated by each member. However, this does not adequately reflect the actual system use during wet weather events as those with low wet weather flows are effectively subsidizing those with excessive wet weather flows that take up more than their share of system capacity.

Apportioning costs based on wet weather flows better reflects the full regional costs of serving each member. This strengthens the "user-pay" principle for allocating costs and motivates members to stay on top of their inflow and infiltration programs to help prevent sanitary sewer overflows.

The GVS&DD Board approved amendments to the *Cost Apportionment Bylaw* that incorporate wet weather pricing, to be phased in over 10 years starting in 2024.

Strategy 7 Minimize impacts of sanitary sewer overflows on human health and the environment

As actions on reducing inflow and infiltration in private laterals are long-term initiatives, sanitary sewer overflows will continue to occur. Metro Vancouver will continue to assess the effects of sanitary sewer overflows on the receiving environment and reduce the impacts of overflows on human health and the environment.

Metro Vancouver reports sanitary sewer overflows immediately to the federal and provincial governments, regional health authorities, and associated municipalities. Metro Vancouver also provides real-time information about sanitary sewer overflows so that local First Nations and residents can make informed decisions about fishing, cultural and ceremonial use, harvesting, and recreational activities near areas where overflows occur.

Supports Goals: Prevent pollution

Actions

7.1 Metro Vancouver will continue to post real-time sanitary sewer overflow information on the Metro Vancouver website.
Timeline: ongoing
New action

7.2 Metro Vancouver will continue to, and members will, inform the Province, regional health authorities, and the First Nations Health Authority of any sanitary sewer overflows as soon as they occur.
Timeline: ongoing
Adapted from: 3.5.6, 3.5.9

7.3 Metro Vancouver and members will report annually on the number and location of sanitary sewer overflows, and, where feasible, the estimated volumes and probable causes.
Timeline: ongoing
Adapted from: C23, 3.3.5, 3.3.7, 3.5.6, 3.5.9
Aligned with: P10

7.4 Metro Vancouver will conduct risk assessments at any new significant regional sanitary sewer overflow locations and will holistically compare the risk assessments of all sanitary sewer overflow locations to determine their relative risk, considering risks to public health and the environment. Metro Vancouver will use the results of the sanitary sewer overflow risk assessments to prioritize mitigation efforts, to optimize the operation of the regional liquid waste collection system, and to provide input into decisions regarding capital improvements and upgrades.

Timeline: ongoing
Adapted from: C4, 2011 MC4
Aligned with: P12

7.5 Metro Vancouver and members will continue to develop and implement municipal-regional sanitary overflow management plans to eliminate overflows at chronic locations. Metro Vancouver will report on progress toward the implementation of these management plans including an updated list of infrastructure constructed to manage wet weather.
Timeline: ongoing; report on progress within two years
Adapted from: 2002 MC4, 1.2.4, 1.2.5

Performance Indicators

7A Number, duration, and estimated volume of sanitary sewer overflow discharge events at chronic overflow sites, where feasible; and, total number of sanitary sewer overflow discharge events and total volume of sanitary sewer overflow discharges for entire system.

Responsibility: Metro Vancouver and members
Adapted from 2011 performance measure: number of sanitary sewer overflows – frequency, location, volume

Combined Sewer Overflows

Combined sewers carry both sanitary wastewater and rainwater in a single pipe and exist only in older parts of Vancouver, Burnaby, and New Westminster. During dry weather, combined sewers convey all sanitary wastewater to wastewater treatment plants, where treated effluent is released to local water bodies. During heavy rainfall, excess rainwater in the system can cause combined sewage to overflow into local water bodies. This is because combined sewers were designed to provide system relief and avoid sewage backups into homes and businesses.

Metro Vancouver monitors its combined sewers continuously and reports overflows annually to Environment Canada. To address the *Canada-wide Strategy for the Management of Municipal Wastewater Effluent* (CWS-MMWE) and the *Municipal Wastewater Regulation*, Metro Vancouver and members with combined systems (Vancouver, Burnaby, and New Westminster) are working on separating all combined sewers to improve the water quality of our local water bodies while increasing system resilience.

History of Combined Sewers

In the 1913 *Vancouver and Districts Joint Sewerage and Drainage Board Report*, R.S. Lea recommended that municipalities build separated sewer systems:

> Whilst nearly every modern Sanitarian admits that the separate is the better system, it is looked on as somewhat of a luxury. It must not be forgotten, however, that the luxury of to-day becomes the necessity of to-morrow, and in considering a scheme of this magnitude, the trend of modern practice must be taken into account rather than the actual methods in use at the present time.

However, combined sewers were built because municipalities at the time deemed that separated sewers would be too costly. Combined sewers continued to be constructed in Vancouver, Burnaby and New Westminster until the 1950s when the decision was made to build regional interceptors and wastewater treatment plants.

The City of Vancouver began separating existing combined sewers in the early 1970s when its oldest sewers, in the West End, first came due for replacement. The City of Burnaby and the City of New Westminster began separating their sewer systems in 2002, when the first LWMP required separation. The sewers in those municipalities are about a generation younger than in Vancouver, owing to their more recent development.

The LWMP sets sewer separation deadlines of 2050 in the Vancouver Sewerage Area and 2075 in the Fraser Sewerage Area. A combined sewer overflow storage tank built by the City New Westminster and Metro Vancouver enabled the 2075 deadline.

Strategy 8 Assess impact of combined sewer overflows on receiving environment

Members with combined systems (Vancouver, Burnaby, and New Westminster) and Metro Vancouver can reduce the impact of combined sewer overflows on the receiving environment by better prioritizing action. The current metric of using combined sewer overflow volumes simply tracks the severity of the rainfall event, with higher rainfalls causing more volume but also more dilute overflows. The result is a weak correlation to the impact on the environment by combined sewer overflows. Prioritizing action based on characterizing the quality (including sanitary loading) of the overflows, in addition to combined sewer overflow volumes and frequencies, should result in better correlation to receiving environment monitoring data. This will allow better assessment of the effects of combined sewer overflows on receiving waters and of the progress of corrective measures.

As separation of combined sewers continues, Metro Vancouver and members with combined systems will develop and implement system optimization projects in the near term that decrease sewage discharges to receiving waters. This will involve the use of models to evaluate various system management measures, giving preference to higher concentrations of sewage for treatment, and assessing their potential environmental benefits.

Supports Goals: Prevent pollution, Reflect First Nations' priorities

Actions

8.1 Metro Vancouver will continue to post real-time information on regional combined sewer overflow location, flow volume, and duration on the Metro Vancouver website.
Timeline: ongoing
New action

8.2 Metro Vancouver will continue to estimate and report annually on the frequency, location, and volume of sewage overflows from regional combined sewers, and where feasible identify and address the probable causes.
Timeline: ongoing
Adapted from: C14, 3.3.5
Aligned with: P7

8.3 Metro Vancouver will continue to monitor combined sewer overflow flows and characterize samples from combined sewer overflow discharges. Members with combined systems will begin to monitor combined sewer overflow flows and characterize samples from combined sewer overflow discharges.
Timeline: within five years
Adapted from: 2011 MC6
Aligned with: P7

8.4 Members with combined systems will report on combined sewer overflows.

a) Members with combined systems will continue to estimate and report annually on the frequency, location, and volume of combined sewer overflows from municipal sewers, and where feasible identify and address the probable causes.

b) Members with combined systems will begin reporting combined sewer overflow flow monitoring and characterization and assessment of environmental impacts, or pursue an alternate approach approved by the Ministry of Environment and Climate Change Strategy.

Timeline: within five years
Adapted from: C14, 3.3.7

8.5 Metro Vancouver will continue to assess change in receiving environment water quality resulting from any measures taken to address combined sewer overflow discharges. Metro Vancouver will report out, as applicable, in the *Environmental Management and Quality Control Annual Report*.
Timeline: ongoing
Adapted from: C4, 2011 MC4
Aligned with: P7

8.6 Metro Vancouver and members with combined systems will use available information and environmental management tools to inform the prioritization of sewer separation and near term combined sewer overflow mitigation measures.
Timeline: ongoing
Adapted from: 2011 MC4

8.7 Metro Vancouver will use sewer separation data supplied by members with combined systems in a sewer system model to estimate the relative proportion of sanitary and rainwater flows in combined sewer overflows at outfalls. Metro Vancouver will use the model results to evaluate system management measures for reducing combined sewer overflow sanitary loading to the receiving environment.
Timeline: within three years
New action

8.8 Metro Vancouver and members with combined systems will continue to develop and implement system optimization projects in the near term to minimize combined sewer overflow sanitary sewage loading and minimize total combined sewer overflow volume spilled, using information from 8.4, 8.5, 8.6, and 8.7.

a) Metro Vancouver will update its system operation control strategies so that regional interceptors preferentially convey flows with higher concentrations of sanitary sewage to wastewater treatment plants.

b) Metro Vancouver and members with combined systems will implement operational improvements that minimize total volume and sanitary sewage loading in overflows, while considering interactions of the regional and municipal sewer systems.

Timeline: within five years
Adapted from: C13, C16
Aligned with: P11

8.9 Metro Vancouver and members with combined systems will maintain monitors at combined sewer overflow sites.

a) Metro Vancouver will maintain installed monitors to estimate overflow volume and frequency. Metro Vancouver will ensure the number and location of monitors is sufficient for characterizing discharges [see 8.3] and modelling sanitary flows [see 8.7] to prioritize combined sewer overflow mitigation actions [see 8.8].

b) Members with combined systems will maintain installed monitors to estimate overflow volume and frequency.

Timeline: ongoing

Adapted from: C12, 3.3.3

Performance Indicators

8A Number, duration and volume of combined sewer overflow discharge events at each combined sewer overflow site; and, total number of combined sewer overflow discharge events and total volume of combined sewer overflow discharges for entire system.

Responsibility: Metro Vancouver and members

New indicator

8B Sanitary wastewater volume (m^3) and loading* in combined sewer overflow discharges.

Responsibility: Metro Vancouver

Frequency: every two to four years

Replaces 2011 indicator: sanitary sewage volumes in combined sewer overflows

*Note, loading will be determined using best available information from either monitoring [see 8.3] or modelling [see 8.7]. Parameters and units of reporting to be determined.

Strategy 9 Separate combined sewers to eliminate overflows

Metro Vancouver and members with combined sewers (Burnaby, New Westminster, and Vancouver) have committed to eliminate combined sewer overflows by 2050 in the Vancouver Sewerage Area and by 2075 in the Fraser Sewerage Area.

To demonstrate continuing progress towards eliminating combined sewer overflows, Metro Vancouver in consultation with members will develop and submit intermediate targets for separation of combined catchments to the Ministry of Environment and Climate Change Strategy every five years. To guide this work, Metro Vancouver will engage with Burnaby, New Westminster, Vancouver, and local First Nations to develop a framework to prioritize sewer separation projects. The intermediate targets will be used to track progress of project delivery.

Historically, some creeks and streams in the region were buried with their flow piped into combined (and sometimes sanitary) sewers. Similarly, some lakes and ponds were connected to combined sewers to maintain water levels. These incoming extraneous flows discharge continuously and occupy pipe capacity designed for conveyance of sanitary sewage, adding unnecessary operational and financial costs for conveyance and treatment. Due to climate change, increases in rainfall and consequently extraneous flows will increase the risk of combined sewer overflows, system surcharging, and potential flooding. Disconnecting these extraneous flows from the sewer system can also facilitate daylighting of streams, which restores habitat and cultural value for First Nations, and creates public amenities.

Supports Goals: Prevent pollution, Reflect First Nations' priorities

Actions

9.1 Members will ensure that no new combined sewer laterals will be constructed on private or public property. Burnaby, New Westminster, and Vancouver will replace existing combined sewers with separate systems during redevelopment or significant renovations.
Timeline: ongoing
Adapted from: 1.2.1
Aligned with: P6

9.2 Metro Vancouver will develop intermediate targets on a five-year interval for municipal and regional separation of prioritized combined catchments. The targets will be based on a framework to be developed with Burnaby, New Westminster, Vancouver, and First Nations, that considers key factors such as cultural value, population, redevelopment rates, and operational considerations. Metro Vancouver will submit the targets to the Ministry of Environment and Climate Change Strategy.
Timeline: within five years
Adapted from: C15, 2011 MC10, 1.2.1, 1.2.2, 1.2.3
Aligned with: P6

9.3 Burnaby, New Westminster, and Vancouver will continue to work with Metro Vancouver to develop and implement Sewer Separation and Combined Sewer Overflow Elimination Plans to prevent combined sewer overflows, and in the interim, support the intermediate targets developed in action 9.2 by:

a) prioritizing combined catchments for separation;
b) sequencing the separation of regional trunk sewers and municipal collector sewers in the prioritized catchments; and
c) developing a strategy to separate combined sewer connections from private properties.

Burnaby, New Westminster, and Vancouver will separate municipal collector sewers according to the Sewer Separation and Combined Sewer Overflow Elimination Plans, such that:

- Vancouver Sewerage Area members will prevent combined sewer overflows by 2050 by replacing combined sewers with separate sanitary and storm sewers at an average rate of 1 per cent of the system per year.
- Fraser Sewerage Area members will prevent combined sewer overflows by 2075 by replacing combined sewers with separate sanitary and storm sewers at an average rate of 1.5 per cent of the system per year.

Timeline: ongoing
Adapted from: C15, 1.2.2, 1.2.6

9.4 Metro Vancouver or the member will replace combined regional trunk sewers with separated sanitary and storm sewers as determined by the Sewer Separation Plans.
Timeline: ongoing
Adapted from: 1.2.3

9.5 Members with combined systems will show progress of sewer separation and reduction of the sanitary loadings in combined sewer overflows by reporting the percentage of population with 100 per cent sanitary sewage delivered to Metro Vancouver interceptors. To do so, those members will develop and maintain a database of properties where private side plumbing is separated and feeds into separated municipal and regional sewers.
Timeline: within five years
New action

9.6 Members with combined systems will remove extraneous flows from creeks, lakes, and underground streams that discharge continuously into combined or sanitary sewers, in alignment with Sewer Separation and Combined Sewer Overflow Elimination Plans outlined in Action 9.3:
a) Members with combined systems will develop plans to remove extraneous flows.
b) Members with combined systems will implement the plans to remove the extraneous flows and provide progress updates every five years.

Timeline: (a) within three years
New action

Performance Indicators

9A Percentage of public sewer system that is separated
Responsibility: Metro Vancouver and members
New indicator

Note: This performance indicator will be supplemented by the "Percentage of population with 100 per cent sanitary sewage delivered to Metro Vancouver interceptors" within five years, as per action 9.5.

Rainwater Management

In urban areas, most rainwater and melting snow go into storm sewers (via the grated drains in streets), which typically empty into rivers, creeks, and adjacent lowland agricultural areas, or directly into the ocean. As rainwater travels along paved and unpaved surfaces to storm sewers, it can pick up pollution along the way. Urban rainwater can carry motor oil, gasoline, animal excrement, garbage, fertilizer, and other contaminants directly into the nearest body of water, where these materials can be harmful to plants, wildlife, and humans. Heavy storms can also introduce a lot of rainwater into streams and creeks in a short period of time, causing erosion and stirring up sediment, which makes it hard for fish to breathe.

In nature, trees and earth help absorb rain slowly, breaking down pollutants, refilling groundwater and keeping waterways healthy. In urban areas, buildings, roads, and other impervious surfaces do not allow rainwater to soak into the ground. The figure below illustrates the differences in the water cycle.

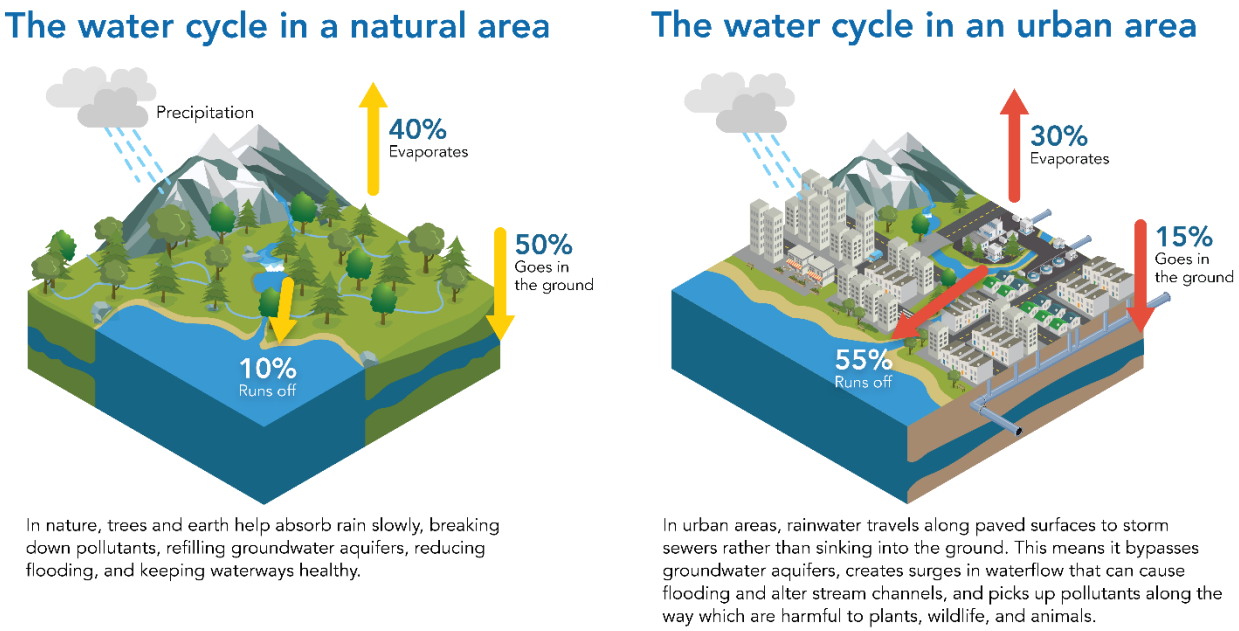


Figure 5 – The water cycle in a natural area vs. an urban area

Approaches that mimic natural processes using green infrastructure, blue infrastructure and thoughtful development patterns allow rainwater to soak into the ground or be released more slowly into local waterways. These approaches are combined with grey infrastructure (sewers and pumps) to help protect against flood risk, especially during higher intensity rain events and in lower elevation areas. Climate change will increase the frequency and intensity of rainfall events, adding stress to the system. From a hydrological perspective, the combined capacity of the green, blue and grey infrastructure needs to be able to absorb the increasing rainfall to avoid flooding.

Metro Vancouver members have been using Integrated Stormwater Management Plans (ISMPs) to manage rainwater with the aim of keeping waterways and lands healthy. Metro Vancouver supports

them by facilitating information sharing, helping develop tools and resources, and liaising with regulators. In collaboration with specific local governments, Metro Vancouver provides drainage services within the Still Creek–Brunette River Drainage Area and the Port Moody–Coquitlam Drainage Area.

Strategy 10 Manage rainwater and urban development for watershed health

The region contains over 100 watersheds with creeks and rivers of all sizes that provide habitat for fish and wildlife as well as recreation for communities. The health of these watersheds is also integral to First Nations food security and sovereignty. Integrated Watershed Management Plans (IWMPs), considered more holistic than the previously named Integrated Stormwater Management Plans (ISMPs), are tailored to each watershed to guide land use and development while prioritizing watershed and stream health. IWMPs must recognize the role that First Nations play in stewarding the land and water. Developing IWMPs presents an opportunity to build strong, collaborative, and respectful relationships with First Nations based on mutual understanding and shared objectives.

The Stormwater Monitoring and Adaptive Management Framework (AMF) was implemented in 2014 as guidance for monitoring and improving watershed health, and as a tool for evaluation of effectiveness of ISMPs. Integrating the AMF as a core component of IWMPs will establish it as an ongoing dynamic evaluation tool to improve IWMPs and best allocate resources. Using this integrated framework allows for dynamic adaptation: if positive watershed health indicators emerge, IWMP renewal periods can be extended; conversely, if degradation occurs, timely corrective actions can be taken.

A critical aspect of watershed health is groundwater, a vital drinking water source for parts of Metro Vancouver. Green infrastructure solutions mimic natural systems that slowly infiltrate rainwater into the ground, allow plants and soil to filter out pollutants, and replenish aquifers with clean groundwater. The development of standards for green infrastructure reflects our deepening understanding of interconnected environmental systems. By working together through IWMPs and the AMF, we can support healthy watersheds and sustainable groundwater resources.

Supports Goals: Restore ecological systems, Reflect First Nations' priorities

Actions

10.1 Members will use the Stormwater Monitoring and Adaptive Management Framework (AMF) to monitor watershed health:

a) Metro Vancouver will coordinate revising the existing Integrated Watershed Management Plan (IWMP) template, with input from First Nations that have chosen to participate, to incorporate the AMF.

b) Members will adopt the revised IWMP template and the associated AMF.

c) Members will implement AMF monitoring programs and will use AMF monitoring findings to continuously improve the IWMPs by (i) establishing criteria to define watershed health, (ii) comparing AMF findings against the watershed health criteria to determine the timing of IWMP review, and (iii) updating IWMP actions when review is triggered. The IWMP review period may be extended from 12 years to a maximum of 15 years when monitoring shows a healthy or improving watershed.

Timeline: (a) within two years; (b) within three years; (c) ongoing
Adapted from: C4, C39, 2011 MC6, 2011 MC7, 2011 MC9, 2011 MC10, 3.3.3, 3.5.6, 3.5.9
Aligned with: P25

10.2 Members will continue to develop, review and update Integrated Watershed Management Plans (IWMPs):

a) Members will prioritize watersheds for IWMP development with First Nations that have chosen to participate, using AMF criteria and additional criteria co-developed with First Nations that consider cultural significance and Aboriginal rights and interests.
b) First Nations will participate in IWMP development, monitoring, and review, as desired and mutually agreed upon, including sharing information about their respective land use plans as appropriate.
c) Members will continue to create, review, and update IWMPs for all watersheds with developed area currently above 20 per cent and will begin to create, review and update IWMPs for watersheds planned to have future developed area above 20 per cent, according to the prioritization sequence defined under (a).

Timeline: (a) within five years; (b), (c) ongoing
Adapted from: C17, 2011 MC10, 3.3.3
Aligned with: P25

10.3 Members will ensure IWMPs integrate rainwater and groundwater management, consider agricultural land rainwater runoff, and reflect the provisions of the Province's *Watershed Security Strategy* once it is launched.
Timeline: ongoing
Adapted from: C47, C48, 2011 MC9
Aligned with: P30

10.4 Members will align land-use planning and development with IWMPs to ensure development decisions support watershed health objectives, including protecting riparian areas and agricultural areas.
Timeline: TBD
Adapted from: 2011 MC6, 2011 MC9, 3.4.7

10.5 Members will expand the use of green infrastructure, blue infrastructure, and other practices to mimic natural watersheds, reduce runoff and discharge, improve water quality and increase climate resilience.
Timeline: TBD
Adapted from: C17

Performance Indicators

A complete set of performance metrics for this strategy will be presented in Rainwater Dashboards once they are created under Action 11.3.

10A Number of IWMPs completed, the area (hectares) they cover, and status or percentage complete of each IWMP action.

Responsibility: Members
Adapted from 2011 performance measure: number and area [hectares] of integrated stormwater management plans completed

Strategy 11 Update and harmonize municipal tools for rainwater management

Long-term success in managing urban watersheds and rainwater systems hinges on three pillars: consistent funding, clear policies, and effective programs.

Dedicated funding specifically tailored to each community's unique needs is crucial. This empowers local authorities to proactively plan for, respond to, and mitigate rainwater challenges. Funding sources can include general tax revenue, utility fees, parcel taxes, or other innovative options.

Watersheds do not respect jurisdictional boundaries. Harmonizing rainwater policies, programs, and bylaws across jurisdictions will create a unified regional direction for managing rainwater and watersheds.

Previously, the LWMP biennial report was the sole method for reporting on Integrated Watershed Management Plans (IWMPs) and the Adaptive Management Framework (AMF). A more dynamic approach is proposed: replacing the report with a rainwater dashboard. This shift towards data transparency and accessibility would enhance accountability by providing continuous access to IWMP progress and data collected through AMF monitoring programs.

Supports Goals: Restore ecological systems

Actions

11.1 Members will each establish dedicated funding to ensure consistent and reliable service delivery for rainwater management.
Timeline: within three years
New action

11.2 Members will update rainwater policies, programs, and bylaws in a harmonized manner:

a) Metro Vancouver will coordinate the development of a guidance document to aid members in harmonizing rainwater policies, programs, and bylaws.

b) Members will then review and update rainwater policies, programs and bylaws.

c) Metro Vancouver and members will coordinate and advocate with other levels of government to resolve rainwater policy conflicts and barriers.

Timeline: (a) within two years; (b) within five years after (a); (c) ongoing.
Adapted from: C38, 1.1.12.b, 1.1.12.e, 1.1.12.f, 1.1.14, 1.1.16, 1.1.20

11.3 Metro Vancouver will coordinate the development of a template for an online rainwater dashboard for members to report on IWMP progress, including contributions to watershed health (e.g., percentage impervious area, length of daylighted waterways, etc.). Members will then implement the online rainwater dashboards.
Timeline: implement dashboards within three years
New action

11.4 Metro Vancouver will coordinate, with members, an approach for seeking to update the Master Municipal Construction Documents such that green infrastructure guidelines become standards.
Timeline: within five years
Adapted from: C20, 1.1.12.f, 1.1.21

Performance Indicators

Performance indicators will be reported by members through the new rainwater dashboards developed in 11.3. Members will select key rainwater indicators to be reported annually in the LWMP dashboard as well (see Monitoring and Reporting section).

Strategy 12 Enhance interagency collaboration to improve watershed health across the region

Formed in 2002, the Stormwater Interagency Liaison Group has played a valuable role in implementing rainwater management actions outlined in the LWMP. However, to better address evolving environmental challenges, climate change, urban development realities, evolving regulatory roles, and First Nations rights and interests, the group requires a refresh.

Updating the interagency group's terms of reference and mandate will renew its vision and will position the group as a unified voice for the region to engage with provincial authorities on rainwater management. This includes ensuring alignment with diverse mandates and initiatives, particularly in the critical area of balancing plans to increase housing density with the need to protect watershed health. The interagency group will coordinate with participating First Nations to provide feedback on IWMPs to Metro Vancouver and members.

Supports Goals: Restore ecological systems, Reflect First Nations' priorities

Actions

12.1 Metro Vancouver will coordinate a revision of the interagency group's terms of reference, possibly to operate as a sub-committee under the Regional Engineer's Advisory Committee (REAC), to lead local research on rainwater management, to be the primary regional advocate with regulators, to promote education and outreach on rainwater management, and to coordinate region-wide accountability on IWMP actions. Metro Vancouver and members will actively participate in the revitalized interagency group.
Timeline: revise terms of reference within one year
Adapted from: C36, 1.1.12.a, 3.5.2, 3.5.10

12.2 Members and Metro Vancouver, as the interagency group, will conduct a regional study of the impacts of densification on watershed health. Members will use the study results to make informed decisions that balance urban growth and ecological resilience.
Timeline: within two years
Adapted from: 2011 MC6, 2011 MC9.b

12.3 Members and Metro Vancouver, as the interagency group, will conduct a cost-benefit analysis to quantify the benefits of green infrastructure and associated lifecycle costs in the region.
Timeline: within three years
New action

12.4 Members and Metro Vancouver, as the interagency group, will host a forum at regular intervals to report progress on IWMPs and LWMP rainwater actions, and to foster collaboration and knowledge sharing among members, First Nations, and interested parties.
Timeline: at least every three years
Adapted from: C37, 2011 MC10

Performance Indicators

None proposed for this strategy.

Wastewater Treatment

Metro Vancouver operates five wastewater treatment plants that currently process over one billion litres of wastewater every day. Wastewater contains different compounds and waste products including soap, food scraps, human waste, oils, and other chemicals. Treating wastewater removes substances that can harm human health and the environment. During and after treatment, wastewater is tested to ensure that treatment plant processes are working effectively and meeting regulations. Treated wastewater, or effluent, is released into the Fraser River, Burrard Inlet, or Strait of Georgia.

Wastewater Treatment Processes

- Primary treatment removes materials that float or readily settle out by gravity.
- Secondary treatment uses biological processes to remove 90 per cent of the organic materials.
- Tertiary treatment removes specific substances, such as ammonia or fine solids, after secondary treatment. Tertiary treatment can involve physical, chemical, or biological processes.
- Tertiary filtration is a physical process that improves treated wastewater quality beyond that achieved by primary or secondary treatment by removing additional suspended solids and associated organic matter.
- In British Columbia, advanced treatment means any form of treatment other than dilution that produces effluent with BOD_5 and TSS both less than 10 mg/L, which are measures of organic material and suspended solids, respectively.

Three of Metro Vancouver's wastewater treatment plants currently perform secondary treatment: Annacis Island, Lulu Island, and Northwest Langley. Metro Vancouver is upgrading both of its primary treatment plants, Iona Island and Lions Gate, to secondary treatment to conform with Ministerial Conditions from previous LWMPs and the Canadian Council of Ministers of the Environment (CCME) *Canada-wide Strategy for Management of Municipal Wastewater* (CWS-MMWE).

Metro Vancouver follows the CWS-MMWE Environmental Risk Management Framework to determine effluent discharge objectives and meet National Performance Standards. If this prescribed process identifies potential environmental risk, it may lead to actions such as source control initiatives, treatment process optimization, and wastewater treatment plant improvements and upgrades. When considering level of treatment for wastewater treatment plant improvements and upgrades, Metro Vancouver considers factors including funding availability, First Nations' concerns, societal values, and other input from engagement on projects.

The site-specific effluent discharge objectives are set for Metro Vancouver wastewater treatment plants based on relevant water quality guidelines, including site-specific water quality objectives where available. When the federal or provincial governments review these water quality objectives/guidelines, First Nations are invited by the presiding government to provide input, and can provide direct feedback on water quality objectives/guidelines.

Strategy 13 Treat wastewater so effluent meets or surpasses regulatory requirements

Metro Vancouver will continue to follow the CWS-MMWE Environmental Risk Management Framework to reduce risks to human health and the environment that may be identified through ongoing monitoring and assessment programs. Metro Vancouver will identify and pursue risk mitigation approaches as appropriate, including source control, treatment process optimization, and, when required, treatment upgrades.

Metro Vancouver has planned wastewater treatment projects to improve effluent quality and accommodate a growing population. These include upgrades such as upgrading a plant from primary to secondary treatment, or expansions such as increasing the plant's capacity to treat a higher maximum capacity. Future wastewater treatment projects and their estimated dates of initiation and operation are presented in the Wastewater Treatment Plant Upgrade and Expansion Schedule in Appendix A. Other wastewater treatment plant infrastructure projects not listed in these schedules may be driven by factors such as maintenance or resilience, and are captured in Metro Vancouver's Long Range Capital Plan that is updated annually as part of the budgeting process.

Table 1 shows the current and planned future level of treatment at each wastewater treatment plant. The level of treatment is selected to meet or surpass the regulatory requirements of Operational Certificates issued by the Province and to be consistent with the requirements of the CWS-MMWE. Table 1 also identifies additional treatment beyond secondary treatment planned for future upgrades, including ammonia removal and tertiary filtration.

Table 1 Levels of Treatment

Current level of treatment	**Wastewater treatment plant**	**Planned future level of treatment**
Primary	Iona Island	Secondary† (membrane filtration), or‡ Secondary† plus tertiary filtration (cloth media filters)
	Lions Gate (current) / North Shore (future)	Secondary† plus tertiary filtration (cloth media filters)
Secondary	Annacis Island	Secondary plus ammonia removal
	Lulu Island	Secondary
	Northwest Langley	Secondary (biological nutrient removal) plus tertiary filtration (cloth media filters)

† The designs for the Iona Island Wastewater Treatment Plant secondary upgrade and the North Shore Wastewater Treatment Plant include future-proofing to enable ammonia removal by adjusting operation of secondary treatment processes. Ammonia removal will begin when it is identified as required by the CWS-MMWE Environmental Risk Management Framework.

‡The specific technology for Iona Island Wastewater Treatment Plant will be selected during preliminary design.

Supports Goals: Prevent pollution, Reflect First Nations' priorities

Actions

13.1 Metro Vancouver will plan, design, operate, and maintain wastewater treatment infrastructure using the CWS-MMWE Environmental Risk Management Framework to address and adapt to identified risks and long term needs, and will additionally incorporate risks associated with climate change into the framework.
Timeline: ongoing
Adapted from: C9, 1.3.4, 1.3.5, 1.3.6, 1.3.7, 3.4.1

13.2 Metro Vancouver will continue to monitor the quantity and characteristics of Metro Vancouver's wastewater treatment plant effluent discharges and assess effluent quality in accordance with the CWS-MMWE.
Timeline: ongoing
Adapted from: C4, C11, 1.3.7, 3.3.2
Aligned with: P2

13.3 Metro Vancouver will continue to monitor influent and the receiving environment where wastewater treatment plants discharge and assess results to determine whether any actions, such as additional source control or treatment upgrades, are required.
Timeline: ongoing
Adapted from: C4, C9, C11, 2011 MC6, 1.3.7, 3.3.1
Aligned with: P2, P3

13.4 Metro Vancouver will upgrade wastewater treatment processes and plants according to the Wastewater Treatment Plant Upgrade and Expansion Schedule.

a) Metro Vancouver will update the Wastewater Treatment Plant Upgrade and Expansion Schedule and will report the updates to the Ministry of Environment and Climate Change Strategy.
b) Metro Vancouver will engage with First Nations on planned wastewater treatment upgrades when preparing and updating the Wastewater Treatment Plant Upgrade and Expansion Schedule, and will do so in a manner that is consistent with applicable federal and provincial law, and according to the level of First Nations interest.
c) Metro Vancouver will engage with the public and other interested parties on planned wastewater treatment upgrades when preparing and updating the Wastewater Treatment Plant Upgrade and Expansion Schedule.
d) Metro Vancouver will upgrade wastewater treatment plants in accordance with the timelines shown in the Wastewater Treatment Plant Upgrade and Expansion Schedule.

Timeline: (a) every two years; (b), (c), (d) ongoing.
Adapted from: 2011 MC10, 1.3.5

Performance Indicator
Results from monitoring of Metro Vancouver's wastewater treatment plant influent and effluent quantity and characteristics will continue to be reported in the Environmental Management and Quality Control Annual Report.

Strategy 14 Operate and maintain wastewater treatment plants to meet or surpass regulatory requirements

Effective operation and maintenance of Metro Vancouver's wastewater treatment plants is critical to meet regulatory requirements and to provide high quality effluent for discharge or reuse. Consistent compliance requires continuous monitoring, testing, and adjustment of treatment processes.

Supports Goals: Prevent pollution

Actions

14.1 Metro Vancouver will operate wastewater treatment plants to meet or surpass requirements specified in each facility's Operational Certificate and CWS-MMWE National Performance Standards for wastewater effluent.
Timeline: ongoing
Adapted from: 1.3.4, 1.3.6

14.2 Metro Vancouver will update and implement asset management plans to enhance the operational efficiency of wastewater treatment plants, maintain the reliability of the existing infrastructure and equipment for wastewater treatment plants that address risks including climate change and seismic events, and maintain performance in wet weather.
Timeline: ongoing
Adapted from: 3.1.5
Aligned with: P3

14.3 Metro Vancouver will report on bypass conditions that occur at wastewater treatment plants in the *Environmental Management and Quality Control Annual Report*. The report on each activity will include a description of the event, cause, and environmental effect.
Timeline: ongoing
Adapted from: 2011 MC8

Performance Indicator

14A Compliance with BOD and TSS limits specified in Operational Certificates for wastewater treatment plants (percentage of time)
Responsibility: Metro Vancouver
Adapted from 2011 performance measure: compliance with parameters specified in the Operational Certificates for wastewater treatment plants

Biosolids

Biosolids are the treated organic material that is recovered from wastewater treatment. The end result is an earth-like product that is rich in nutrients and organic matter. Biosolids can be used to improve soil health, or as source of energy. Nutrifor™ is the brand name for the biosolids that Metro Vancouver produces. Currently, Nutrifor biosolids are applied to land within the region and around the province as a fertilizer or as an ingredient to build healthy soil.

Metro Vancouver plans for the current and future management of biosolids by taking into account growth in the region, wastewater treatment infrastructure upgrades, and new technologies. The stability and resilience of biosolids management in the region depends on ensuring a diversity of best available technologies and customer markets, a solid scientific foundation, and a commitment to the environment, public health, and future generations.

Strategy 15 Diversify options to beneficially use Nutrifor biosolids

Population growth and wastewater treatment plant upgrades will significantly increase the amount of biosolids produced, and the greenhouse gas emissions to manage biosolids may also increase. Diversifying markets and best available technologies will ensure beneficial use of all Nutrifor biosolids to avoid landfill disposal of a valuable resource. New options can also recover energy and minimize greenhouse gas emissions.

Supports Goals: Recover resources, Restore ecological systems, Reflect First Nations' priorities

Actions

15.1 Metro Vancouver will grow the land application program and will increase public outreach and education, including to First Nations, on how Nutrifor biosolids are used safely and responsibly as fertilizer and as an ingredient to build healthy soil.
Timeline: ongoing
Adapted from: C34, C35, 2011 MC10, 2.1.1.a.5
Aligned with: P21

15.2 Metro Vancouver will beneficially use dried Nutrifor biosolids pellets:

a) Metro Vancouver will build a regional biosolids dryer to produce granular pellets that can be used as a low carbon fuel and as a fertilizer product.

b) Metro Vancouver will work with the Province to certify the pellets as a retail-grade organic matter product under OMRR or other regulation as appropriate.

Timeline: (a) by 2032-2037
Adapted from: 2.1.1.a.4, 2.1.1.a.5
Aligned with: P21

15.3 Metro Vancouver will explore technologies that displace the production of Nutrifor biosolids, such as thermal technologies that convert sludge to low carbon fuel with a net positive energy balance and net greenhouse gas emissions reduction.
Timeline: ongoing
Adapted from: 2.1.1.a.4

Aligned with: P21

15.4 Metro Vancouver will process Nutrifor biosolids at Metro Vancouver's Waste-to-Energy Facility to maintain contingency management options when other markets or uses cannot be accessed.
Timeline: ongoing
Adapted from: 2.1.1.a.4
Aligned with: P21

15.5 Members will continue to use Nutrifor landscaping soil in municipal projects when feasible.
Timeline: continuing
Adapted from: 2.1.1.a.5, 2.1.4

Performance Indicators

15A Beneficial use of Nutrifor biosolids (percentage of total biosolids generated)
Responsibility: Metro Vancouver
New indicator

15B In-region use of Nutrifor biosolids (percentage of total biosolids generated)
Responsibility: Metro Vancouver
New indicator

Circular Water Economy

Wastewater is rich in resources, including energy, nutrients, and water. A circular water economy recovers and recycles these resources to provide value for citizens, the environment, and businesses. Metro Vancouver already recovers energy from wastewater in the form of biogas and heat, nutrients in the form of Nutrifor biosolids, and water for use in wastewater treatment plants. Innovative technologies are being developed that can recover even more resources from wastewater and propel the transition to a circular water economy.

Strategy 16 Implement proven resource recovery technologies

Metro Vancouver will continue to implement proven technologies for resource recovery at its wastewater treatment plants and in its collection system when there is a good business case. Recovering resources from wastewater creates revenue while reducing environmental footprint. Successful resource recovery projects rely on a strong and diverse network of partners including member jurisdictions to address challenges such as regulatory issues, public perception, and market integration of recovered resources.

Supports Goals: Recover resources

Actions

16.1 Metro Vancouver will recover energy from the liquid waste system to reduce regional greenhouse gas emissions and support the region's transition to clean energy.

a) Metro Vancouver will continue to identify and implement best uses of biogas from wastewater treatment plant digesters. This includes use at Metro Vancouver wastewater treatment plants and upgrading biogas for sale to other parties as renewable natural gas, when appropriate.

b) Metro Vancouver will continue to recover thermal energy from sewage and treated effluent for use at Metro Vancouver facilities, when appropriate.

c) Metro Vancouver will continue to provide access to sewage and effluent for heat recovery to members, First Nations, and district energy providers, when appropriate.

d) Metro Vancouver will continue to invest in sewer heat recovery and effluent heat recovery projects, when appropriate.

Timeline: ongoing

Adapted from: 2011 MC10, 2.1.1.a, 2.1.2, 2.1.3

16.2 Metro Vancouver will recover water from the liquid waste system.

a) Metro Vancouver will continue to use treated wastewater in Metro Vancouver's wastewater treatment plants, which reduces use of potable water in plant processes.

b) Metro Vancouver will review and recommend revisions and extensions to Board policy on reclaimed water use, to provide guidance on enabling use of treated wastewater by other off-site parties throughout the region. Potential uses include sewer flushing, hydro-excavation, irrigation, vehicle washing, dust suppression, and other beneficial uses.

c) Metro Vancouver will construct and operate facilities to provide reclaimed water from wastewater treatment plants for on-site use or to other parties for use at off-site locations, when financially and environmentally appropriate.

Timeline: ongoing
Adapted from: 2.1.1.a, 2.1.2, 2.1.3

16.3 Metro Vancouver will recover nutrients and other materials from liquid waste.

a) Metro Vancouver will continue to periodically evaluate the business case for recovering nutrients and other materials from liquid waste.

b) Metro Vancouver will implement promising technologies when financially and environmentally appropriate.

Timeline: ongoing
Adapted from: 2.1.1.a, 2.1.2, 2.1.3

16.4 Members will use recovered energy and water when feasible.

a) Members will continue to explore recovery of thermal energy from sewage and treated effluent for use in district energy systems, and will implement heat recovery projects in collaboration with Metro Vancouver when financially and environmentally appropriate.

b) Members will identify potential uses of reclaimed treated wastewater and rainwater by institutions and businesses throughout the region such as sewer flushing, hydro-excavation, irrigation, vehicle washing, dust suppression, and other beneficial uses, and will support and establish facilities and programs to use reclaimed water when financially and environmentally appropriate.

Timeline: ongoing
Adapted from: 2.1.4

Performance Indicators

16A Amount of energy recovered from liquid waste system (GJ)§

Responsibility: Metro Vancouver and members
Adapted from 2011 performance measure: quantities and types of energy and materials recovered from the liquid waste system.

§ Sum of GJ from all energy types (e.g., biogas, sewer heat, biocrude), recovered by Metro Vancouver or members, for use by any end customer.

Strategy 17 Research and pilot innovative technologies to advance the circular water economy

Metro Vancouver can support exploration of new resource recovery technologies and approaches that reduce operational risks, improve performance, increase resilience, and decrease costs. Promising solutions need to be piloted in a real-world wastewater environment as a critical step in progressing from lab-scale testing to full-scale adoption. Investing in research and pilots of new technologies not only ensures sustainable wastewater management for Metro Vancouver, but can also cultivate the next generation of researchers and boost economic growth in the region.

Supports Goals: Recover resources

Liquid Waste as a Resource

The liquid waste system is rich in resources that can be recovered, including:

- Biogas from existing wastewater processes, which can be upgraded for use as renewable natural gas
- Low-carbon biofuel from new sludge conversion technology, which can replace diesel for transportation
- Heat from sewage or treated wastewater effluent, which can be used to heat buildings in areas with district energy systems
- Nutrients such as nitrogen or phosphorous, which can be used for fertilizer
- Reclaimed (treated) water, which can be used for non-potable purposes like sewer flushing, street sweeping, landscape watering, or agricultural purposes
- Alternative fuels, such as hydrogen or ammonia, that could be used for heavy-duty transportation
- Carbon dioxide that can be recovered from biogas, for industrial use

New resources and novel uses may emerge as research progresses.

Actions

17.1 Metro Vancouver will research, develop and pilot new methods to expand the recovery and use of energy, nutrients, water and other emerging resources from the liquid waste system, by:

a) Hosting pilots in wastewater treatment plants and the collection system
b) Collaborating with researchers at academic institutions
c) Collaborating with other utilities and water research organizations
d) Partnering with water technology developers
e) Collaborating with First Nations on pilot projects as desired
f) Conducting public outreach and education about resource recovery, including to First Nations

Timeline: ongoing
Adapted from: 2011 MC10, 2.1.1.a, 3.2.2

17.2 Metro Vancouver will foster circular water economy innovation within the liquid waste system by:

a) Leveraging the Lulu Island Wastewater Treatment Plant Pilot Digestion Optimization Facility as a platform for piloting and developing new technologies and enhancements
b) Embedding spaces for future treatment technology pilots into the upgraded Iona Island Wastewater Treatment Plant
c) Integrating circular water economy principles into Metro Vancouver wastewater facility plans
d) Promoting circular water economy innovation and research through sharing our story and actively participating in industry organizations and regional networks

Timeline: ongoing
New and Adapted from: 3.2.2

Performance Indicators

None proposed for this strategy.

Environmental Management

Many environmental management strategies and actions have been integrated into each of the preceding sections. This section contains environmental management strategies and actions that either apply across a number of preceding sections or do not specifically apply to any one section.

Strategy 18 Minimize impacts of liquid waste management on the atmosphere and air quality

Managing greenhouse gas emissions from wastewater systems aligns with regional, provincial, and federal climate goals. Metro Vancouver and members will continue to quantify and manage greenhouse gas emissions, other air emissions including potential air contaminants, and odours associated with operating and maintaining the liquid waste system. Reducing air pollution improves environmental quality and public health. Reducing air contaminants and odours is also a stated high priority for First Nations leadership and communities.

Supports Goals: Prevent pollution, Reflect First Nations' priorities

Actions

18.1 Metro Vancouver and members will continue to develop and implement programs and policies to track greenhouse gas emissions associated with the construction and operation of wastewater collection and treatment systems, including developing and implementing new monitoring plans where necessary.
Timeline: ongoing
Adapted from: 3.3.4, 3.3.6

18.2 Metro Vancouver and members will continue to develop and implement programs and procurement policies to reduce greenhouse gas emissions associated with the design, construction, operation, and management of wastewater collection and treatment systems, to help achieve federal, provincial, and Metro Vancouver greenhouse gas reduction targets, using business case analysis techniques to assess opportunities and options.
Timeline: ongoing
Adapted from: 1.3.10, 1.3.17

18.3 Metro Vancouver and members will manage air emissions from standby power generators:

a) Metro Vancouver will continue to develop and implement air emissions management programs for standby power generators, including assessment of desirability of retrofit and accelerated asset replacement where appropriate.

b) Members will continue to develop and implement air emissions management programs for standby power generators at municipal sewer pump stations.

Timeline: ongoing
Adapted from: 1.3.9, 1.3.16

18.4 Metro Vancouver will develop and undertake a program to characterize emissions from various processes at wastewater treatment plants (e.g., digesters, exhausts, stacks) during operation, preventative maintenance, and emergency maintenance. Metro Vancouver will identify potential concerns, and, where appropriate, undertake studies of best economically feasible control processes or technologies.
Timeline: ongoing
Adapted from: 1.3.9

18.5 Metro Vancouver will continue odour management programs at wastewater treatment plants and targeted facilities in the regional sewer system. These programs are driven by community acceptance and industry best practices, and are designed to: establish the current odour levels through monitoring; set targets for future odour levels through modelling; and, identify and implement the steps to achieve the targets through mitigation.
Timeline: ongoing
Adapted from: 1.3.8, 3.3.4, 3.3.6

18.6 Members will continue existing municipal odour control programs and implement new programs for targeted municipal sewer facilities.
Timeline: ongoing
Adapted from: 1.3.15, 3.3.4, 3.3.6

Performance Indicators

18A Greenhouse gas emissions from operation of Metro Vancouver's liquid waste management system (tonnes CO_2e per year).

Responsibility: Metro Vancouver
New indicator

Strategy 19 Environmental monitoring to protect public health and the environment

Metro Vancouver regularly tests and monitors areas where treated wastewater is released into the environment and the overall health of the aquatic environment. The Environmental Monitoring Committee was established under the 2002 LWMP to provide scientific advice and recommendations on the effect of liquid waste discharges on the receiving environment and monitoring of the environmental health of the receiving environment. The committee members are staff with scientific and technical expertise from federal and provincial government, academic institutions, Metro Vancouver, and member jurisdictions.

Metro Vancouver monitors the water quality of local recreational waters from May to September, testing beaches at least once a week. Water samples are taken from over 100 sites in 40 locations across the region. Metro Vancouver provides test results to regional health authorities, who then determine whether notices should be posted at beaches to inform of possible risk for swimming.

The environmental monitoring and reporting actions in this strategy continue to provide information for use in assessments to protect public health and the environment.

Supports Goals: Prevent pollution, Reflect First Nations' priorities

Actions

19.1 Metro Vancouver will continue to receive advice from the Environmental Monitoring Committee. The Committee will continue to be responsible for reviewing the scope and design of monitoring programs, review of monitoring results, predictive modelling, and risk assessments of waste discharges.
Timeline: ongoing
Adapted from: C2, 3.5.2, 3.5.10
Aligned with: P2

19.2 Metro Vancouver will continue to monitor recreational water quality (seasonal beach monitoring) throughout the region, will continue to share this information with municipal beach operators and local Health Authorities, and will share this information with the First Nations Health Authority.
Timeline: ongoing
Adapted from: C4, 2011 MC6, 2011 MC10

19.3 Metro Vancouver will continue to monitor substances of interest in effluent and environmental fate of priority contaminants and their potential for adverse effects.
Timeline: ongoing
Adapted from: 2002 MC7

Performance Indicators

19A Beach advisory days per year and locations (number of days)

Responsibility: Metro Vancouver
Copy of 2011 performance measure

Testing Wastewater for COVID-19 and Other Viruses

Metro Vancouver is working with the BC Centre for Disease Control and the University of British Columbia to track the presence of respiratory viruses in the region's wastewater. Respiratory virus particles are shed in the feces of people who have the virus and can be detected in wastewater.

Untreated wastewater entering each of Metro Vancouver's five wastewater treatment plants is sampled and tested three times a week for these respiratory viruses:

- SARS-CoV-2, commonly known as COVID-19
- Influenza A and Influenza B, commonly known as the flu
- Respiratory Syncytial Virus (RSV), a common respiratory virus that usually causes mild, cold-like symptoms

While wastewater testing cannot tell us the number of people who are infected or contagious, it can tell us which respiratory viruses are present and how viral levels might be changing over time. This information may help health authorities evaluate the effectiveness of measures to control the virus in the community.

Strategy 20 Collaborate on regional environmental management initiatives

These actions support collaboration with interested parties on environmental management initiatives for the protection of public health and the environment.

Supports Goals: Prevent pollution, Reflect First Nations' priorities

Actions

20.1 Metro Vancouver will participate in relevant collaborative environmental program(s) for regional water bodies (i.e., Fraser River, Burrard Inlet, Strait of Georgia) along with members, First Nations, senior governments, and interested parties.
Timeline: ongoing
Adapted from: 2011 MC10, 3.3.1, 3.5.3

20.2 Metro Vancouver will continue to participate, and members may participate, in provincial processes to review and establish water uses and water quality objectives for specific water bodies within Metro Vancouver.
Timeline: ongoing
Adapted from: C1, C49, 2011 MC10, 1.3.18, 3.3.1

20.3 Members will work with private marina operators, the Province, and the federal government to develop and implement regulations to ensure all new marinas and marinas where planned renovations exceed 50 per cent of the assessed existing improvement value have pleasure craft pump-out facilities.
Timeline: ongoing
Adapted from: C41, 1.3.13

20.4 Members will 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.
Timeline: ongoing
Adapted from: C42, 1.3.14

Performance Indicators

None proposed for this strategy.

Water Quality Objectives for səlilwət / Burrard Inlet

Water Quality Objectives (WQOs) are developed for waterbodies of regional, provincial, inter-provincial, international, and Indigenous significance. WQOs establish levels for substances in waterbodies to protect water quality, guide resource management decisions, and support the responsible stewardship of water resources.

> *Tsleil-Waututh (səlilwətaɬ) means "People of the Inlet". Since time out of mind, səlilwətaɬ people have used, occupied, governed, and stewarded their territory. səlilwətaɬ hold a sacred, legal obligation and responsibility to protect, defend, and steward the lands and waters of their territory, in accordance with səlilwətaɬ law, for past, present, and future generations. This stewardship responsibility requires restoring conditions that provide the environmental, cultural, spiritual, and economic foundation for səlilwətaɬ people to thrive.*
>
> *— səlilwətaɬ (Tsleil-Waututh Nation)*

WQOs for Burrard Inlet were initially developed in 1990 by the Province. In 2017, səlilwətaɬ published the Burrard Inlet Action Plan to summarize scientific knowledge, identify priority issues and gaps related to environmental degradation, foster environmental stewardship, and identify near-term actions to improve the health and integrity of the inlet. The first of six strategic priorities was to update the WQOs for Burrard Inlet.

səlilwətaɬ led the update of the WQOs in collaboration with the Province. This update combines səlilwətaɬ Indigenous science and knowledge, improved western science, and more recent monitoring data, to lay the foundation for further efforts to protect the water quality and values in Burrard Inlet. Metro Vancouver and members participated in the Burrard Inlet Water Quality Technical Working Group and Roundtable for this update. Action 20.2 in this LWMP continues Metro Vancouver's and members' commitment to participating in the review and update of WQOs when they occur. Several strategies in this plan commit to monitoring the impacts of wastewater discharges to the environment, including whether WQOs are being met.

The updated Water Quality Objectives for Burrard Inlet are co-signed by the Province and səlilwətaɬ. The vision is to increase the benefits of Burrard Inlet for all in the region by reducing stressors and improving water quality, balancing ecological, social, economic, health, and First Nation cultural values. The water values to be protected in the Burrard Inlet include: human consumption of shellfish and finfish, aquatic life, wildlife, cultural practices, recreational uses, and institutional uses.

Monitoring and Reporting

Monitoring and reporting the progress on LWMP actions is important to ensure that Metro Vancouver and members are implementing actions as planned; continuing to be transparent and accountable to the Province, First Nations, the public, and interested parties; and meeting regulatory obligations. This process also helps Metro Vancouver and member jurisdictions to reflect on their progress, share successes and challenges, learn from each other, and collaborate to find solutions.

This updated LWMP introduces new reporting approaches to improve ease of understanding, accountability, transparency, and collaboration:

- a streamlined annual report to the Province with a snapshot view of progress;
- increased public access to LWMP performance indicators through online dashboards;
- regular collaborative meetings between Metro Vancouver and member jurisdictions; and,
- regular meetings between Metro Vancouver and the Province to share progress and discuss challenges.

The following sections explain how Metro Vancouver and member jurisdictions will use the new LWMP Annual Report, LWMP Dashboard, and Progress Meetings to ensure progress toward LWMP goals.

LWMP Annual Report

Metro Vancouver will submit an Annual Report to the Province outlining the progress of Metro Vancouver and member jurisdictions in implementing LWMP actions. Once approved by the Province, the report will be posted publicly on Metro Vancouver's website. The report will contain the following three elements, which are described in detail in Appendix C:

1. **Action Status Table**
   This is a snapshot showing the current status ('Complete,' 'In Progress,' or 'Not Started') of each action and sub-action in the LWMP, for Metro Vancouver and each member jurisdiction. Evidence supporting the reported status of actions will be provided by Metro Vancouver or member jurisdictions should the Province request it.

2. **Performance Indicators Table**
   This table will show the numerical values of the LWMP performance indicators (listed in Appendix B) for Metro Vancouver and member jurisdictions, compiled annually.

3. **LWMP Progress Context and Insights**
   Metro Vancouver and members will prepare contextual information and insights on implementation of select LWMP actions. Content will include:
   - Progress on key priority LWMP actions and highlights for ongoing actions (the 30 actions to be reported in this section are shown in Appendix C, Table C.1)
   - Explanations of missed deadlines for action completion
   - Changes in approach from the original approved LWMP actions

- 2002 LWMP reporting commitments C14, C18, C23 and 2011 LWMP reporting commitments 3.5.4 (b) and 3.5.8 (b) will continue to be reported unless different reporting requirements are agreed to with the Province.

Metro Vancouver will create templates for all three elements of the LWMP Annual Report that members will complete, and will coordinate the compilation of submissions from Metro Vancouver and each member jurisdiction on an annual basis. The timing for completion will be established through discussion with the Province and member jurisdictions and will be aligned with completion of the Environmental Management and Quality Control (EMQC) Annual Report.

The EMQC Annual Report will continue to be prepared and posted publicly to meet Metro Vancouver's regulatory reporting requirements. Some LWMP actions refer to the EMQC Annual Report directly and will be reported upon primarily in the EMQC Annual Report to reduce redundancies. Table C.1 in Appendix C indicates which LWMP actions will continue to be reported in the EMQC Annual Report.

LWMP Dashboard

LWMP performance indicators will be compiled into an easily accessible dashboard format on Metro Vancouver's website (see example in Appendix C). The format of the LWMP Dashboard will be improved, integrated, and updated over time in alignment with other Metro Vancouver dashboards.

The full list of LWMP performance indicators is shown in Appendix B. The LWMP Dashboard will contain performance indicators for both Metro Vancouver and member jurisdictions. The numerical values displayed in the LWMP Dashboard will be updated at least annually, in alignment with the LWMP Annual Report. Metro Vancouver will coordinate the compilation and publishing of information on Metro Vancouver's website. There will also be links to the inflow and infiltration dashboards, inflow and infiltration public reports and the rainwater dashboards once they are created (see Actions 6.1, 6.2 and 11.3). Key rainwater indicators from the rainwater dashboards will be included directly in the LWMP Dashboard (as described in Strategy 11 and Appendix B).

Progress Meetings

Regular meetings are planned as a key element in monitoring progress on LWMP actions, aimed at improving accountability and collaboration. See Appendix C for further details on the planned meetings:

1. **Metro Vancouver – Member Jurisdiction Meetings**
   Metro Vancouver and member jurisdictions will use staff-to-staff meetings to update each other on progress on actions, reach consensus on how to implement shared actions, learn from each other about successes and challenges, and collaborate on solutions. Metro Vancouver will coordinate meeting to discuss the LWMP at least once per year.

2. **Metro Vancouver – Ministry of Environment and Climate Change Strategy Meetings**
   Metro Vancouver and the Ministry of Environment and Climate Change Strategy currently meet quarterly to discuss Metro Vancouver's liquid waste function. Following adoption of this LWMP, at two of these meetings per year, Metro Vancouver will include LWMP progress reporting on

the agenda to highlight successes, discuss challenges, and receive input from the ministry on proposed solutions.

There may be LWMP topics that warrant the scheduling of additional meetings between the ministry, Metro Vancouver, and interested First Nations.

Monitoring and Reporting Roles and Responsibilities

Through the LWMP Annual Report, LWMP Dashboard, and Progress Meetings, Metro Vancouver and member jurisdictions will streamline regulatory reporting requirements, improve transparency and accountability, and formalize opportunities for collaboration on implementation of actions.

The following table provides an overview of roles and responsibilities for monitoring and reporting on LWMP Progress:

Item	Frequency	Roles and Responsibilities				
		Metro Vancouver	**Member Jurisdictions**	**Province (Ministry [§])**	**First Nations**	**Public**
LWMP Annual Report	Annual	Contribute and compile	Contribute	Receive and review	Access on website	Access on website
LWMP Dashboard	Annual (at least)	Contribute and compile	Contribute	N/A	Access on website	Access on website
LWMP Progress Meetings – Metro Vancouver and Member Jurisdictions	Annual (at least)	Coordinate and participate	Coordinate and participate	N/A	Invited periodically according to mutually agreed schedules	N/A
LWMP Progress Meetings – Metro Vancouver and Ministry[§]	Twice per year	Coordinate and participate	N/A	Participate	Invited periodically according to mutually agreed schedules	N/A

[§]Ministry of Environment and Climate Change Strategy

Financial Implications

Overview

The updated LWMP continues Metro Vancouver's longstanding commitment to achieving compliance with the *Municipal Wastewater Regulation* in a manner that is fiscally responsible and fair across generations. The plan acknowledges the broader financial pressures on taxpayers, who are also contributing to other essential services in the region such as hospitals and transportation infrastructure. The LWMP actions balance progress towards *Municipal Wastewater Regulation* compliance with the need to manage costs effectively.

Through the LWMP update process, new actions have been identified and efforts related to ongoing initiatives have been expanded to accelerate progress toward full compliance under the *Municipal Wastewater Regulation*. The financial impact of these new and expanded actions were assessed to understand the financial implications on the GVS&DD levy.

Several initiatives will primarily be carried out using current staff resources that are funded through existing sources in annual program budgets, resulting in no net increase in spending. Additional funding of approximately $5 million annually will be necessary for new actions and to expand existing programs. A significant portion of the additional funding will be allocated to enhancing environmental management programs. This funding will support LWMP commitments and address feedback received from First Nations and interested parties, including the public advisory committee. The increases will have a minimal impact on the overall GVS&DD operating budget, as they represent less than 1 per cent of the total budget for the liquid waste function.

Capital and Member Jurisdiction Cost Exclusions

No additional capital projects are anticipated to fulfill the LWMP commitments during the plan's 10-year implementation period. The financial projections in this LWMP exclude existing capital projects that are already included in Metro Vancouver's Five-Year Financial Plan and Ten-Year Projections. For example, the North Shore Wastewater Treatment Plant and the Iona Island Wastewater Treatment Plant secondary upgrade are already included. Furthermore, member costs have been excluded from these estimates due to significant variation in resources and funding approvals across different member jurisdictions. The focus of this section is to understand implications on the GVS&DD levy due to new and revised actions identified in this LWMP.

Reducing Demand and Shifting Responsibilities

The LWMP emphasizes strategies to reduce demand on the system, such as managing inflow and infiltration in private laterals, which will help reduce the need for costly expansion to regional infrastructure. These strategies will gradually shift some financial responsibilities from the regional level to private property owners or individual members, allowing for a more localized approach to addressing system capacity and compliance challenges. The end result is a net reduction in costs for the region due to a shift in costs from regional infrastructure expansions to management of inflow and infiltration at the municipal level.

Summary

While the LWMP outlines significant new actions and improvements, the overall financial impact on the GVS&DD budget is minimal. Most funding is integrated into existing programs, with a marginal increase

required for environmental management programs. This approach ensures continued environmental leadership and progress toward *Municipal Wastewater Regulation* compliance while keeping household costs manageable and avoiding major impacts on regional budgets.

Glossary

Adaptive Management Framework (AMF) provides an approach for monitoring watershed health, monitoring the progress and effectiveness of Integrated Watershed Management Plans (IWMPs), identifying impacts and threats to watershed health, and identifying mitigation approaches. It is a continuous improvement process that promotes flexible decision making that can be adjusted over time as the outcomes of IWMP actions are better understood.

Advanced treatment, in British Columbia, means any form of treatment other than dilution that produces effluent with BOD_5 and TSS both less than 10 mg/L, which are measures of organic material and suspended solids, respectively.

Air contaminants are any substances emitted into the air that do or could harm public health (including material physical discomfort) and property, damage the environment (including the climate), impede normal business operations, or impair visual air quality.

Ammonia is a compound of nitrogen and hydrogen (NH_3) commonly found in wastewater. It is an indicator of organic pollution and can be toxic to aquatic life at high concentrations.

Asset management plans are developed by utilities and municipalities to maintain and replace infrastructure assets, such wastewater systems, to ensure their reliability, sustainability, and cost-effectiveness over their life cycle.

Average dry weather flow is the average daily flow of wastewater in a sewer system or input to a treatment plant during dry weather conditions, which indicates the flow of sanitary sewage and excludes additional flow from rainfall or snowmelt infiltration.

Biochemical Oxygen Demand (**BOD)** is a measure of the amount of oxygen that microorganisms need to decompose the organic material present in wastewater. If it were not removed, BOD would use up the oxygen in the water that fish and other aquatic life need. BOD_5 is the BOD measured over a 5-day period, and is one of the parameters regulated in effluent from Metro Vancouver's wastewater treatment plants.

Biogas is a mixture of methane and carbon dioxide produced by the anaerobic digestion of sewage sludge at a wastewater treatment plant. Biogas can be cleaned up for use as renewable natural gas.

Biosolids are the treated solids recovered from wastewater. The solids have been treated by microorganisms and heat to eliminate pathogens and reduce odours. The final product is similar to soil and is rich in nutrients and organic matter.

Blue infrastructure refers to natural and engineered systems that manage water, including natural water bodies like rivers, lakes, and wetlands, as well as engineered solutions such as constructed wetlands and retention ponds.

Canadian Council of Ministers of Environment Canada-wide Strategy for Management of Municipal Wastewater (CCME CWS-MMWW) provides a harmonized framework to manage municipal wastewater discharges to surface waters with federal discharge criteria. It articulates the collective agreement reached by the 14 ministers of environment in Canada to ensure that wastewater facility owners have

regulatory clarity in managing municipal wastewater effluent discharges under a consistent framework that is protective of human health and the environment.

Catchment refers to an area of land where collected rainwater and groundwater feed to a single point in the sewer system.

Circular economy is a system that retains and recovers value from resources through reusing, repairing, repurposing, recycling and remanufacturing products and materials. The circular economy tackles climate change and other environmental challenges by decoupling economic activity from the consumption of finite resources, by eliminating waste and pollution, and helping to regenerate natural systems.

Circular water economy is an approach to wastewater management that emphasizes the recovery, reuse, and recycling of wastewater and the resources it contains, including energy, nutrients and water, to create a sustainable and resilient wastewater system that provides value for citizens, the environment, and businesses.

Climate change adaptation means anticipating, planning for and responding to the adverse effects of climate change and taking appropriate action to prevent or minimize the damage it can cause, or taking advantage of opportunities that may arise. It has been shown that well planned, early adaptation action saves money and lives later.

Climate change mitigation means working to limit the amount of climate change that occurs by reducing greenhouse gas emissions into the atmosphere.

Climate projections refers to the future temperature and precipitation patterns in the region due to the impacts of climate change.

Climate resilience describes the capacity of ecosystems, economies, infrastructure, and communities to absorb the impacts of climate change while maintaining essential services and functions needed to support health and well-being. In some cases, climate resilience involves changing services and functions so they are more sustainable.

Climate vulnerability assessments identify areas or populations most likely to be impacted by projected changes in climate and build an understanding of why these areas are vulnerable, including the interaction between climate change, non-climatic stressors, and cumulative impacts. Assessments evaluate the effectiveness of previous coping strategies and target potential adaptation measures.

Climate vulnerability is the degree to which ecosystems, economies, infrastructure, and communities are susceptible to, or unable to cope with, the adverse effects of climate change. Vulnerability varies based on exposure, sensitivity, and adaptive capacity. Geographic location, socio-economic conditions, and other factors can impact susceptibility to harm and adaptive capacity.

Collection system is the network of pipes, pumps, and other equipment used to collect and transport wastewater from homes, businesses, and industries to a treatment plant. The collection system can refer to sanitary sewers or combined sewers.

Combined sewers carry both sanitary wastewater and rainwater in a single pipe and exist only in older parts of Vancouver, Burnaby, and New Westminster. During dry weather, combined sewers convey all sanitary wastewater to wastewater treatment plants.

Combined sewer overflow is a discharge of sewage from a combined sewer into a water body, caused by excess water entering the combined sewer system during heavy rainfall. The combined sewer system was designed to overflow in this manner to avoid sewage backups into homes and businesses.

Conveyance is the process of transporting wastewater in sewers from its source to a treatment plant or discharge point.

Daylighting is the practice of uncovering and restoring buried urban streams to their natural state, which improves water quality, reduces peak flows, and improves ecosystem health.

Effluent is treated wastewater that is released from a wastewater treatment plant into the Fraser River, Burrard Inlet, or Strait of Georgia.

Gigajoule (GJ) is a unit of energy equal to one billion Joules, commonly used to measure the energy content of fuels.

Grease interceptor a device installed in a plumbing system to capture grease and solids before they enter the sewer system, preventing blockages and treatment issues.

Green infrastructure includes natural, enhanced and engineered systems and practices that manage rainwater and mitigate negative impacts of urban development. These natural assets (e.g., forests, wetlands, and soil), enhanced assets (e.g., urban trees and bioswales), and engineered systems (e.g., green roofs, rain gardens, and permeable pavement) help absorb and filter stormwater to reduce flooding, improve water quality, and enhance urban biodiversity.

Greenhouse gases are air contaminants that trap heat and cause climate change. Greenhouse gases include carbon dioxide and nitrous oxide, as well as short-lived climate forcers such as methane.

Grey infrastructure means engineered infrastructure, such as pipes, pumps, and treatment plants, used to manage rainwater and wastewater. For rainwater management, grey infrastructure includes storm sewers and retention basins.

Hydraulic gradeline is a line representing the level to which water would rise in a system of pipes, channels, and other conduits in the sewer collection system or treatment plant, reflecting the total energy of the water; hydraulic grade lines above basement or ground surface elevations can result in flooding.

Infiltration is rainwater or groundwater that enters a sanitary sewer due to leaky or damaged pipes.

Inflow is rainwater that enters a sanitary sewer due to improperly connected roof or foundation drains.

Integrated Watershed Management Plans (IWMPs) provide direction for future development to balance land use planning, stormwater engineering, flood and erosion protection, and environmental protection. IWMPs were formerly referred to as Integrated Stormwater Management Plans.

Interceptors are large pipes in combined sewer systems that are designated by Metro Vancouver to convey sanitary flow from areas that have separated sewers and the dry weather portion of combined flow from areas that still have combined sewers to the treatment plant.

Land application is the practice of applying biosolids to land to improve soil health and provide nutrients for vegetation or crops, governed by British Columbia's *Organic Matter Recycling Regulation.*

Master Municipal Construction Documents is a standardized set of general conditions, standard specifications and drawings, and design guidelines for the design, construction, and management of municipal infrastructure projects in British Columbia.

Master Sewer Servicing Plan is a comprehensive plan outlining the development, maintenance, and improvement of a municipality's sewer system to meet current and future needs.

Monitors are devices or meters used to measure and record environmental parameters, such as flow rates, water quality, and pollution levels in wastewater systems.

Natural hazards include rainstorms, extreme weather, storm surges, landslides, and floods – which are made worse by climate change – and seismic events.

Nature-based solutions are approaches to rainwater management that use natural processes and green infrastructure to enhance ecosystem health, improve water quality, and provide multiple benefits to communities.

Nutrients are substances such as nitrogen and phosphorus that are essential for the growth of plants and animals, but can cause water quality issues when present in excessive amounts.

Nutrifor is the brand name for the biosolids that Metro Vancouver produces.

Official Community Plan is a comprehensive policy document adopted by a municipal council or regional board that outlines the long-term vision, objectives, and policies for land use, development, and infrastructure within a community. An Official Community Plan addresses various aspects of community planning, including housing, transportation, parks, and utilities, and provides guidance on managing growth and development in a sustainable and orderly manner. The plan must align with provincial legislation and regional growth strategies.

Operational Certificate is issued by the Ministry of Environment and Climate Change Strategy for each treatment plant. The Operational Certificate requires effluent released from the treatment plant to meet certain standards.

Organics loading is the amount of organic matter, measured as BOD, entering a wastewater treatment plant, which influences the plant's design and operation.

Peak dry weather flow is the highest flow rate of wastewater observed during dry weather conditions, used for the design and capacity assessment of sewer collection and treatment systems.

Primary treatment removes materials that float or readily settle out by gravity, and up to 50 per cent of dissolved organic materials.

Private laterals are pipes that connect buildings on private property to municipally owned sewers. Private laterals are typically maintained by property owners.

Rainfall-derived inflow and infiltration comes from rainwater that enters pipes, as opposed to infiltration from groundwater sources (see Inflow and Infiltration).

Rainwater is water that originates from precipitation events, including rain and snowmelt, which flows over land surfaces. In urban areas, rainwater becomes stormwater when it runs off impervious surfaces such as rooftops, roads, and parking lots, and is typically directed into storm sewers.

Receiving environment means the natural water bodies, such as rivers or oceans, into which treated wastewater is discharged (or untreated wastewater in the case of overflows).

Reclaimed water refers to wastewater that has been treated and purified to a level suitable for reuse for various non-potable purposes, such as industrial processes, landscaping, or agricultural irrigation. British Columbia's *Municipal Wastewater Regulation* establishes prescriptive water quality requirements to ensure reclaimed water is safe for its intended uses.

Regional Growth Strategy for the Metro Vancouver region, Metro 2050, is the region's shared vision of how projected population, housing, and job growth will be managed over the next 30 years, to create complete, connected, and resilient communities, while protecting important lands and supporting the efficient provision of urban infrastructure like transit and utilities.

Renewable natural gas is created from biogas that has been cleaned up so that it is mostly methane and can be injected into the natural gas distribution network for use in homes and businesses.

Sanitary loading refers to the portion of sewage in combined sewers that originates from residential, commercial or industrial sources, excluding rainwater.

Sanitary sewage is generated from domestic activities, such as toilets, sinks, showers, and washing machines, as well as from commercial and industrial processes; it excludes rainwater and stormwater.

Sanitary sewers collect wastewater from residential, commercial, and industrial sources, and transport it to wastewater treatment plants for processing.

Sanitary sewer overflow occurs when untreated wastewater is improperly discharged directly into the environment – usually the nearest water body, or sometimes onto land – instead of being processed at a wastewater treatment plant. Sanitary sewer overflows can happen when inflow and infiltration from heavy rainfall overloads the sanitary sewer system.

Secondary treatment uses biological processes to remove 90 per cent or more of materials, including soluble organic materials and small suspended solids that do not readily settle.

Sewer separation replaces combined sewers with separate pipes for sanitary sewage and stormwater, reducing the risk of overflows.

Stormwater is water from rain or melting snow that is not absorbed into the ground. In urban areas, stormwater runs off impervious surfaces such as rooftops, roads, and parking lots, and is typically directed into storm sewers, which empty directly into creeks, rivers, or the ocean.

Stormwater Interagency Liaison Group is mandated in the LWMP since 2002 to advise and work through technical stormwater issues with Metro Vancouver member jurisdictions, and senior government agencies.

Surcharging is a condition in which the pressure in a sewer system causes the water level to rise above the top of the pipe, usually due to excessive flow, leading to potential overflows or backups.

Tertiary filtration is a physical treatment process that improves treated wastewater quality beyond that achieved by primary or secondary treatment by removing additional suspended solids and associated organic matter.

Tertiary treatment removes specific substances including solids, nutrients such as ammonia, and contaminants, after secondary treatment as needed to protect receiving waters where effluent is discharged. Tertiary treatment can involve physical, chemical or biological processes.

Total Suspended Solids (TSS) is a measure of the solids in water that are too small to settle out by gravity. The wastewater treatment process is designed to remove suspended solids, because otherwise the suspended solids would block light in the water and interfere with the growth of aquatic life. TSS is one of the parameters regulated in effluent from Metro Vancouver's wastewater treatment plants.

Trunk sewers are Metro Vancouver sewers designated to convey both sanitary and stormwater flows in areas of the region with combined sewers. Dry weather flow (i.e., sanitary flow) is discharged to interceptor sewers while excess wet weather flows are discharged to receiving waters as combined sewer overflows.

Wastewater is used water that is collected from toilets and drains in homes and businesses, and conveyed in sewers to wastewater treatment plants for processing. Wastewater can contain various pollutants and waste products, including soap, food scraps, human waste, oils and other chemicals.

Wastewater treatment removes substances that can harm human health and the environment before releasing treated wastewater, or effluent, to receiving water bodies. Wastewater treatment processes can be classified as primary, secondary, tertiary, or advanced.

Water metering is the practice of measuring the volume of potable water used by households, businesses, or industries, often for billing and conservation purposes.

Watershed is a land area where all rainwater and snowmelt drains into a common water body such as a creek, river, or ocean.

Appendix A – Wastewater Treatment Plant Upgrade and Expansion Schedule

Project name and scope	Increase in maximum discharge rate in OC	Authorization classification			Anticipated project initiation date [b]	Anticipated operational date [b]
		LWMP Amendment [a]	Operational Certificate Amendment	New Operational Certificate		
North Shore Wastewater Treatment Plant Phase 1 • New preliminary, primary and secondary treatment, tertiary filtration and solids treatment facilities	<0.01%		Y		2011	2030
Annacis Island Wastewater Treatment Plant Stage 5 • Additional preliminary, primary and secondary and solids treatment capacity	55%		Y		2012	2030 – 2035
Northwest Langley Wastewater Treatment Plant Phase 1 • Additional preliminary, primary and secondary treatment capacity • New solids treatment capacity and tertiary filtration	636% [c]	Y	Y		2014	2030 – 2035
Annacis Island Wastewater Treatment Plant Regional Biosolids Dryer • Dryer will process biosolids to produce granular pellets that can be used as low carbon fuel and as fertilizer product	N/A			Y [d]	2019	2032 – 2037
Iona Island Wastewater Treatment Plant Stage 7 • Preliminary, primary and secondary treatment and tertiary filtration facilities • Additional solids treatment capacity • Scope refinement – phasing and existing wastewater treatment plant re-use options assessment	0%		Y		2015	2035 – 2040
Annacis Island Wastewater Treatment Plant Partial Ammonia Removal • Scope to be determined	0%		Y		2024	2038 – 2043
Annacis Island Wastewater Treatment Plant Stage 7 [e] • Scope to be determined	17%	Y	Y		2025 – 2035	2040 – 2050
Northwest Langley Wastewater Treatment Plant Phase 2 [e] • Scope to be determined	88%	Y	Y		2030 – 2040	2045 – 2055
Lulu Island Wastewater Treatment Plant Stage 5 • Scope to be determined	18%	Y	Y		2035 – 2045	After 2050

(a) An Environmental Impact Study will be performed for projects listed as an LWMP amendment.
(b) Anticipated dates will be adjusted subject to engineering studies.
(c) This increase includes flow from new developments and diversion of some flow from Annacis Island Wastewater Treatment Plant to Northwest Langley Wastewater Treatment Plant.
(d) This is a new, additional, separate Operational Certificate for the dryer.
(e) Timing of upgrade is subject to Master Sewer Servicing Plan.

Appendix B – Performance Indicators

Performance indicators listed under each strategy are compiled here for ease of reference.

Issue Area	Strategy	No.	Description	Units	Frequency	Responsibility	Status
System Resilience	1. Provide services for a growing population in a changing climate	1A	Percentage of sanitary sewer pipe inspected annually	%	Annual	Metro Vancouver and members	Adapted from 2011 Performance Measure: Metres of sewer pipe inspected and renewed annually
Demand Side Management and Source Control	3. Use demand side management to reduce flows and loadings	3A	Average dry weather flow per capita, total influent TSS per capita per day, and total influent BOD per capita per day; at each wastewater treatment plant	L/person/day g/person/day g/person/day	Annual	Metro Vancouver	New
Sanitary Sewer Overflows	5. Reduce rainfall-derived inflow and infiltration into private lateral sewers	5A	Peak wet weather flow, average dry weather flow, and ratio of peak wet weather flow to average dry weather flow; at key regional monitoring points and at wastewater treatment plants	MLD MLD ratio peak wet weather flow to average dry weather flow	Annual	Metro Vancouver	Adapted from 2011 Performance Measures: Wet weather peaking factors at key regional monitoring points; Average (24 hour) flows at regional flow monitoring stations and at wastewater treatment plants
Sanitary Sewer Overflows	7. Minimize impacts of sanitary sewer overflows on human health and environment	7A	Number, duration, and estimated volume of sanitary sewer overflow discharge events at chronic overflow sites, where feasible; and, total number of sanitary sewer overflow discharge events and total volume of sanitary sewer overflow discharges for entire system.	#, hours, m^3 #, m^3	Annual	Metro Vancouver and members	Adapted from 2011 Performance Measure: Number of sanitary sewer overflows – frequency, location, volume
Combined Sewer Overflows	8. Assess combined sewer overflows' impact on receiving environment	8A	Number, duration and volume of combined sewer overflow discharge events at each combined sewer overflow site; and, total number of combined sewer overflow discharge events and total volume of combined sewer overflow discharges for entire system.	#, hours, m^3 #, m^3	Annual	Metro Vancouver, Burnaby, New Westminster, and Vancouver	New
Combined Sewer Overflows	8. Assess combined sewer overflows' impact on receiving environment	8B	Sanitary wastewater volume and loading* in combined sewer overflow discharges *Note, loading will be determined using best available information from either monitoring [action 8.3] or modelling [action 8.7]. Parameters and units of reporting to be determined.	m^3, loading units TBD	Every 2-4 years (TBD)	Metro Vancouver	Adapted from 2011 Performance Measure: Sanitary sewage volumes in combined sewer overflows.
Combined Sewer Overflows	9. Separate combined sewers to eliminate combined sewer overflows	9A	Percentage of public sewer system that is separated Note: this indicator will transition to "Percentage of population with 100 per cent sanitary sewage delivered to Metro Vancouver interceptors" within five years.	%	Annual	Metro Vancouver, Burnaby, New Westminster, and Vancouver	New

Issue Area	Strategy	No.	Description	Units	Frequency	Responsibility	Status
Rainwater	10. Manage rainwater and development for watershed health	10A	Number of IWMPs completed, the area that completed IWMPs cover, and percentage of IWMP activities implemented Note: additional performance indicators will be added upon development of the rainwater dashboards.	# hectares %	Annual	Members	Adapted from 2011 Performance Measure: Number and area [hectares] of integrated stormwater management plans completed.
Wastewater Treatment	14. Operate and maintain wastewater treatment plants to meet or surpass regulatory requirements	14A	Compliance with BOD and TSS limits specified in Operational Certificates for wastewater treatment plants	% of time	Annual	Metro Vancouver	Adapted from 2011 Performance Measure: Compliance with parameter specified in the Operational Certificate for wastewater treatment plants
Biosolids	15. Diversify options to beneficially use Nutrifor biosolids	15A	Beneficial use of Nutrifor biosolids (percentage of total biosolids generated)	%	Annual	Metro Vancouver	New
Biosolids	15. Diversify options to beneficially use Nutrifor biosolids	15B	In-region use of Nutrifor biosolids (percentage of total biosolids generated)	%	Annual	Metro Vancouver	New
Circular Water Economy	16. Implement proven technologies towards a circular economy	16A	Amount of energy recovered from liquid waste system [Sum of GJ from all energy types (e.g., biogas, sewer heat, biocrude), recovered by Metro Vancouver or members, for use by any end customer]	GJ	Annual	Metro Vancouver and members	Adapted from 2011 Performance Measure: Quantities and types of energy and materials recovered from the liquid waste system.
Environmental Management	18. Minimize impacts of liquid waste management on atmosphere and air quality	18A	Greenhouse gas emissions from operation of Metro Vancouver's liquid waste management systems	tonnes CO_2e	Annual	Metro Vancouver	New
Environmental Management	19. Environmental monitoring to protect public health and the environment	19A	Number of beach closure days per year and locations	#	Annual	Metro Vancouver	Adapted from 2011 Performance Measure: Beach closure days and locations

Appendix C – Reporting on LWMP Actions

This appendix provides further details on the reporting elements in the 'Monitoring and Reporting' section.

Annual Report

1. **Action Status Table**
   This table will have a row for each action and sub-action in the LWMP, and columns for Metro Vancouver and each member jurisdiction. Metro Vancouver and member jurisdictions will annually report on the status of all actions and sub-actions applicable to them as 'Complete,' 'In Progress,' or 'Not Started.' If the LWMP specified a due date for completing an action, this will be entered into the 'Timeline' column. If context is needed to supplement the action status, this can be provided under the '3. LWMP Progress Context and Insights' section, as described below.

   Excerpt from example Action Status Table:

Action	Sub-Action	Timeline	Metro Vancouver	Member Jurisdiction
5.1	n/a	Within two years		
5.2	a)	Within three years		
	b)	Within three years		

Legend: **Complete** | In Progress | Not Started | Not applicable

   This approach to reporting on actions intentionally does not include explanatory comments, to provide an at-a-glance snapshot for readers to quickly understand general progress among Metro Vancouver and member jurisdictions.

   For actions noted as 'Complete,' Metro Vancouver and member jurisdictions will be prepared to provide the Province with evidence of completion. This may be a report, metrics, maps, or other data or information as appropriate for the particular action.

   In cases where a timeline is not met or an action has not changed for a long period of time from 'Not Started' or 'In Progress,' Metro Vancouver and member jurisdictions will be prepared to provide explanation, rationale, evidence of works in progress or reasons for delays to the Province as necessary.

2. **Performance Indicators Table**
   LWMP performance indicators for Metro Vancouver and member jurisdictions will be compiled annually into a single table that contains numerical values arranged in a format similar to the Action Status Table. The full list of performance indicators is available in Appendix B. Key

indicators from rainwater dashboards (as described in Strategy 11 and Appendix B) will also be included in this table.

3. LWMP Progress Context and Insights

Metro Vancouver and members will prepare contextual information and insights on implementation of select LWMP actions. Content in this section will include:

- *Progress on key priority LWMP actions and highlights for ongoing actions*
  An initial set of 30 out of 87 LWMP actions are proposed for reporting in this qualitative section. The initial list is available in Table C.1 but may change over time through discussion with the Province and member jurisdictions.

  Priority actions selected for reporting include some on inflow and infiltration, combined sewer overflows, integrated watershed management planning and wastewater treatment plant upgrade schedules.

  Some actions are ongoing and can never be considered 'Complete' – for example, some actions related to circular water economy and environmental management. In these cases, when action status is not expected to ever change from 'In Progress,' highlights from the past year's activities will be reported in this section.

  Metro Vancouver and member jurisdictions will use this section to describe work completed, work underway on actions in progress, challenges and successes, provide links to completed reports or documents, and explain quantitative data if needed.

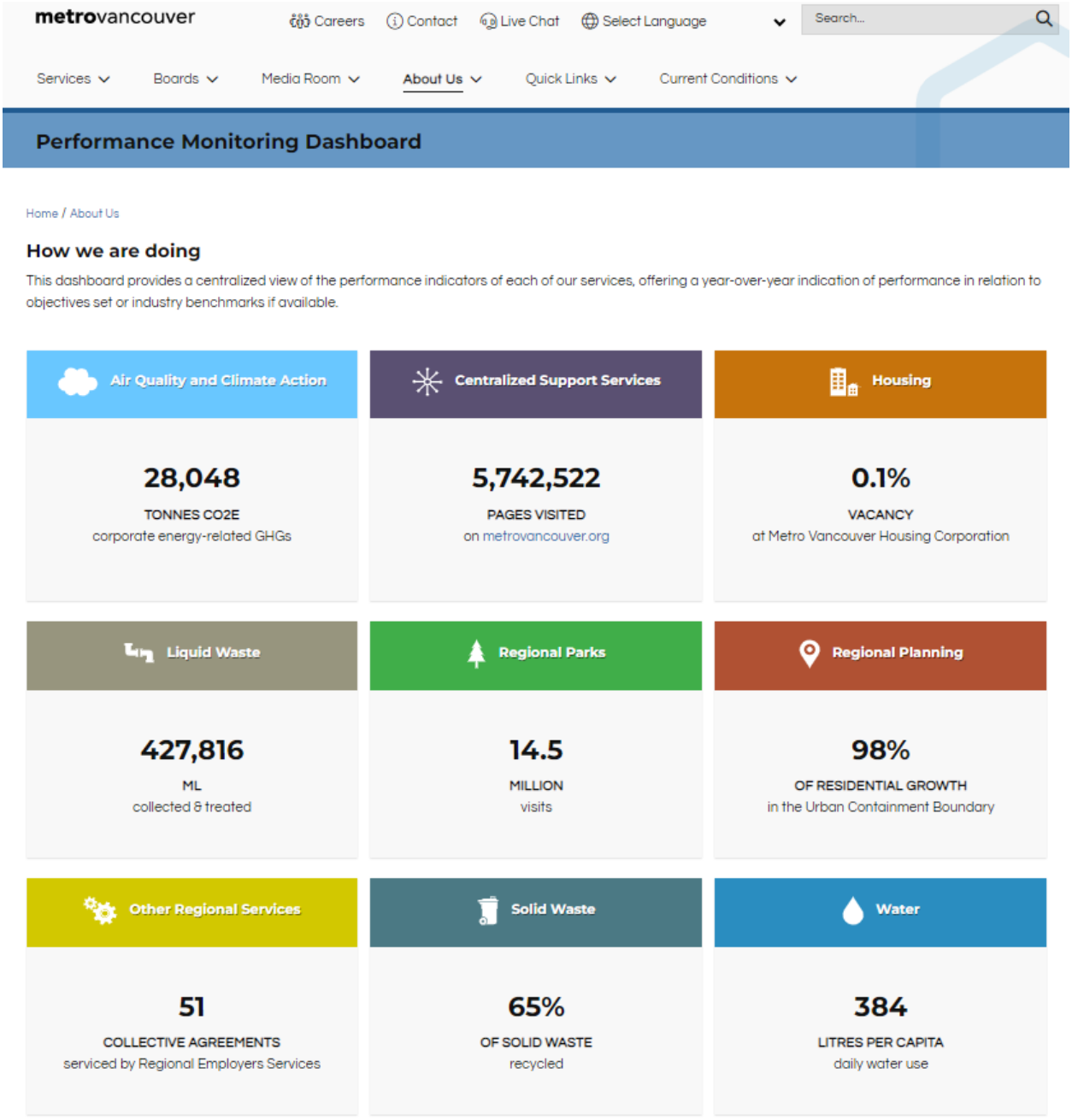
- *Explanations of missed deadlines for action completion.*
  Some actions have specific timeframes for completion. If implementation has been delayed, explanations will be provided in this section and new timelines established.

- *Changes in approach from the original approved LWMP actions.*
  Sometimes, actions that were drafted initially and approved in the LWMP may be later discovered to not be fully feasible or not be the best approach to achieving intended objectives. This section will describe cases where Metro Vancouver or members are proposing to modify individual actions, the impact of the proposed change, and, how First Nations, the public, and interested parties will be engaged regarding the change.

- 2002 LWMP reporting commitments C14, C18, C23 and 2011 LWMP reporting commitments 3.5.4 (b) and 3.5.8 (b) will continue to be reported unless different reporting requirements are agreed to with the Province (refer to 2002 and 2011 past actions in Appendix D for descriptions of these commitments).

LWMP Dashboard

Initially, the format will be similar to other Metro Vancouver Performance Monitoring Dashboards. The screenshot below shows an example of a Metro Vancouver performance monitoring dashboard.



Progress Meetings

1. **Metro Vancouver – Member Jurisdiction Meetings**
   The existing Regional Engineers Advisory Committee (REAC) Liquid Waste Sub-Committee comprises Metro Vancouver and member jurisdiction liquid waste staff and typically meets six times per year.
   - This will be the primary forum for member jurisdictions and Metro Vancouver to discuss progress on LWMP action implementation.
   - The content and timing of LWMP progress updates at these meetings will be established through discussion between Metro Vancouver and member jurisdictions.
   - Outcomes from REAC Liquid Waste Sub-Committee meetings are reported to REAC and, ultimately, to the GVS&DD Board if needed.

   Strategies and actions related to rainwater (i.e., stormwater and watershed) management have been drafted with additional emphasis towards improving how progress is measured, including actions specifically committing to oversight. The approach for meetings is described in Strategy 12: *Enhance interagency collaboration to improve watershed health across the region* through actions that commit member jurisdictions and Metro Vancouver to:
   - Coordinate revision of the terms of reference for the interagency group (currently called the Stormwater Interagency Liaison Group) to include coordination of region-wide accountability on Integrated Watershed Management Plan (IWMP) actions; and,
   - Host a forum at regular intervals (at least every three years) to report progress on IWMPs and LWMP rainwater actions, and to foster collaboration and knowledge sharing among members, First Nations, and interested parties.

2. **Metro Vancouver – Ministry of Environment and Climate Change Strategy Meetings**
   Discussing the LWMP at two meetings per year of the four regularly-scheduled quarterly meetings between the Province and Metro Vancouver will help ensure Metro Vancouver is meeting its regulatory obligations and allow for more frequent communication with the Province regarding:
   - how timelines for action implementation may be changing;
   - whether actions require revisions; and,
   - planned engagement activities if timelines or actions may be revised.

Table C.1

This table shows how each action, sub-action, and performance indicator will be reported over the duration of the LWMP.

Action and sub-action		**LWMP Annual Report**		**Other Reporting Mechanism**	**Performance Indicators** (LWMP Annual Report and Dashboard)
		Action Status Table	**Context and Insights Section**		
Strategy 1: Provide services for a growing population in a changing climate.					1A
1.1	a)	✓			
	b)	✓			
	c)	✓			
1.2	-	✓			
1.3	a)	✓			
	b)	✓			
1.4	-	✓			
Strategy 2: Improve resilience of wastewater system to climate change and natural hazards					
2.1	-	✓			
2.2	-	✓ Reported by sewerage area			
2.3	-	✓			
Strategy 3: Use demand side management to reduce flows and loadings					3A
3.1	-	✓			
3.2	-	✓			
3.3	-	✓			
3.4	a)	✓			
	b)	✓			
	c)	✓			
3.5	-	✓	✓ Describe progress and results		
Strategy 4: Prevent pollution at the source					
4.1	-	✓			
4.2	a)	✓			
	b)	✓			
	c)	✓			
Strategy 5: Reduce rainfall-derived inflow and infiltration into private lateral sewers					5A
5.1	-	✓	✓		
5.2	a)	✓	✓		
	b)	✓	✓		
	c)	✓	✓		
5.3	a)	✓	✓		
	b)	✓	✓		
	c)	✓	✓		
5.4	a)	✓	✓		
	b)	✓	✓		
5.5		✓	✓		
Strategy 6: Enhance transparency and accountability for reducing inflow and infiltration					Inflow and Infiltration Dashboards
6.1	a)	✓	✓ Describe progress and results		
	b)	✓	✓ Describe progress and results		
	c)	✓	✓ Describe progress and results		
6.2	a)	✓	✓ Describe progress and results	✓ Inflow and Infiltration Dashboard, Progress Meetings	
	b)	✓	✓ Describe progress and results	✓ Inflow and Infiltration Dashboard, Progress Meetings	
	c)	✓	✓ Describe progress and results	✓ Inflow and Infiltration Dashboard, Progress Meetings	
6.3	-	✓		✓ Inflow and Infiltration Dashboard, Progress Meetings	
6.4	-	✓	✓ Wet weather pricing findings and modifications		
Strategy 7: Minimize impacts of sanitary sewer overflows on human health and the environment					7A
7.1	-	✓		✓ Posted on website	
7.2	-	✓			
7.3	-	✓	✓ Report on sanitary sewer overflows (volumes, causes)		

Action and sub-action		LWMP Annual Report		Other Reporting Mechanism	Performance Indicators (LWMP Annual Report and Dashboard)
		Action Status Table	Context and Insights Section		
7.4	-	✓		✓ Assessments available to Ministry of Environment and Climate Change Strategy	
7.5	-	✓	✓ Describe progress and results		
Strategy 8: Assess impact of combined sewer overflows on receiving environment					8A, 8B
8.1	-	✓		✓ Posted on website	
8.2	-	✓	✓ Report on combined sewer overflows (volumes, causes)		
8.3	-	✓			
8.4	a)	✓	✓ Report on combined sewer overflows (volumes, causes)		
	b)	✓	✓ Report on combined sewer overflows (impacts)		
8.5	-	✓		✓ EMQC Annual Report	
8.6	-	✓			
8.7	-	✓			
8.8	a)	✓	✓ Describe progress and results		
	b)	✓	✓ Describe progress and results		
8.9	a)	✓	✓ Describe progress and results		
	b)	✓	✓ Describe progress and results		
Strategy 9: Separate combined sewers to eliminate overflows					9A
9.1	-	✓			
9.2	-	✓	✓ Targets will be reported		
9.3	a)	✓			
	b)	✓			
	c)	✓			
9.4	-	✓			
9.5	-	✓			
9.6	a)	✓			
	b)	✓			
Strategy 10: Manage rainwater and urban development for watershed health					10A, Rainwater Dashboards
10.1	a)	✓		✓ Progress Meetings	
	b)	✓			
	c)	✓		✓ Rainwater Dashboards	
10.2	a)	✓			
	b)	✓			
	c)	✓			
10.3	-	✓			
10.4	-	✓			
10.5	-	✓			
Strategy 11: Update and harmonize municipal tools for rainwater management					Rainwater Dashboards
11.1	-	✓	✓Progress toward dedicated funding		
11.2	a)	✓			
	b)	✓			
	c)	✓			
11.3	-	✓	✓Progress on rainwater dashboards	✓ Rainwater Dashboards	
11.4	-	✓			
Strategy 12: Enhance interagency collaboration to improve watershed health across the region					
12.1	-	✓			
12.2	-	✓			
12.3	-	✓			
12.4	-	✓			
Strategy 13: Treat wastewater so effluent meets or surpasses regulatory requirements					
13.1	-	✓			
13.2	-	✓		✓ EMQC Annual Report	
13.3	-	✓		✓ EMQC Annual Report	
13.4	a)	✓	✓ Progress or changes year over year		
	b)	✓	✓ Progress or changes year over year		
	c)	✓	✓ Progress or changes year over year		
	d)	✓	✓ Progress or changes year over year		
Strategy 14: Operate and maintain wastewater treatment plants to meet or surpass regulatory requirements					14A

Action and sub-action		LWMP Annual Report		Other Reporting Mechanism	Performance Indicators (LWMP Annual Report and Dashboard)
		Action Status Table	Context and Insights Section		
14.1	-	✓			
14.2	-	✓			
14.3	-	✓		✓ EMQC Annual Report	
Strategy 15: Diversify options to beneficially use Nutrifor biosolids					15A, 15B
15.1	-	✓			
15.2	a)	✓			
	b)	✓			
15.3	-	✓			
15.4	-	✓			
15.5	-	✓			
Strategy 16: Implement proven resource recovery technologies					16A
16.1	a)	✓	✓ Select highlights from Strategy 16		
	b)	✓	✓ Select highlights from Strategy 16		
	c)	✓	✓ Select highlights from Strategy 16		
	d)	✓	✓ Select highlights from Strategy 16		
16.2	a)	✓	✓ Select highlights from Strategy 16		
	b)	✓	✓ Select highlights from Strategy 16		
16.3	a)	✓	✓ Select highlights from Strategy 16		
	b)	✓	✓ Select highlights from Strategy 16		
16.4	a)	✓	✓ Select highlights from Strategy 16		
	b)	✓	✓ Select highlights from Strategy 16		
Strategy 17: Research and pilot innovative technologies to advance the circular water economy					
17.1	a)	✓	✓ Select highlights from Strategy 17		
	b)	✓	✓ Select highlights from Strategy 17		
	c)	✓	✓ Select highlights from Strategy 17		
	d)	✓	✓ Select highlights from Strategy 17		
	e)	✓	✓ Select highlights from Strategy 17		
	f)	✓	✓ Select highlights from Strategy 17		
17.2	a)	✓	✓ Select highlights from Strategy 17		
	b)	✓	✓ Select highlights from Strategy 17		
	c)	✓	✓ Select highlights from Strategy 17		
	d)	✓	✓ Select highlights from Strategy 17		
Strategy 18: Minimize impacts of liquid waste management on the atmosphere and air quality					18A
18.1	-	✓			
18.2	-	✓			
18.3	a)	✓			
	b)	✓			
18.4	-	✓			
18.5	-	✓	✓ Describe progress and results		
18.6	-	✓	✓ Describe progress and results		
Strategy 19: Environmental monitoring to protect public health and the environment					19A
19.1	-	✓			
19.2	-	✓		✓ EMQC Annual Report	
19.3	-	✓		✓ EMQC Annual Report	
Strategy 20: Collaborate on regional environmental management initiatives					
20.1	-	✓	✓ Describe progress of programs		
20.2	-	✓	✓ Describe progress and results		
20.3	-	✓			
20.4	-	✓			

Appendix D – Status of Past Actions from 2011 LWMP

Ministerial Conditions (MC)	Status	Rationale
MC 1 The Ministry supports upgrading to secondary level treatment the Lions Gate wastewater treatment plant by 2020 and Iona Island wastewater treatment plant as soon as possible, but no later than 2030 and not contingent on the availability of senior government funding. The Ministry of Environment is not a funding agency. While I understand the cost of the upgrades is significant, they are necessary to meet current environmental standards. The Ministry will support Metro Vancouver pursuing senior government and alternative funding options, but cannot guarantee any provincial commitment in that regard, nor compromise the Ministry's mandate to protect the environment.	Removed	Removed. Metro Vancouver is including a Wastewater Treatment Plant Upgrade and Expansion Schedule in this LWMP that shows the planned timing and treatment levels for wastewater treatment plants. Refer to Appendix A for this table. The method for the funding of wastewater treatment plant upgrades is not prescribed in this LWMP because capital programs are established and approved through GVS&DD bylaws, policies, and annual budgets as adopted by the GVS&DD Board.
MC 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.	Continuing	Continuing in Action 3.5. (verbatim)
MC 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.	Continuing	Continuing in Action 3.5. (verbatim)
MC 4 Metro Vancouver must use receiving environment and effluent monitoring data from combined sewer overflow (CSO) and sanitary sewer overflow (SSO) in the regional system to interpret the overall status of CSOs and SSOs. Metro Vancouver will continue the fate and effects studies on CSOs with the Clarke Drive location and other significant sites as determined by the Environmental Management Committee. Metro Vancouver will establish similar studies representative of significant SSO locations, in particular the Cloverdale, Katzie and Lynn locations. The interpretation and assessment should demonstrate whether there has been any improvement or degradation along with any measures taken to address such discharges. Metro Vancouver will report out in the Quality Control Annual Report.	Continuing	Continuing in Action 7.4 (conduct risk assessments at any new significant regional sanitary sewer overflow locations and will holistically compare the risk assessments of all sanitary sewer overflow locations to determine their relative risk, considering risks to public health and the environment. Metro Vancouver will use the results of the sanitary sewer overflow risk assessments to prioritize mitigation efforts, to optimize the operation of the regional liquid waste collection system, and to provide input into decisions regarding capital improvements and upgrades); Action 8.5 (Metro Vancouver will continue to assess change in receiving environment water quality resulting from any measures taken to address combined sewer overflow discharges. Metro Vancouver will report out, as applicable, in the *Environmental Management and Quality Control Annual Report*); and Action 8.6 (Metro Vancouver and members with combined systems will use available information and environmental management tools to inform the prioritization of sewer separation and near term combined sewer overflow mitigation measures).
MC 5 Metro Vancouver is encouraged to continue to build upon previous studies associated with studying endocrine-disrupting chemicals, persistent organic pollutants and other micro-contaminants found in wastewater by developing source control initiatives through education (for example, target outreach), regulation and inspection programs.	Continuing	Continuing in Action 4.1 (Metro Vancouver will prioritize contaminants for source control using the Canadian Council of Ministers of Environment (CCME) *Canada-wide Strategy for Management of Municipal Wastewater Effluent* (CWS-MMWE) Environmental Risk Management Framework. Metro Vancouver will take further source control actions such as educating target sectors to reduce discharges, advocating for increased provincial and federal regulations on the manufacturing and use of products with contaminants, and updating Metro Vancouver's bylaws for industrial and commercial dischargers. Metro Vancouver will work with First Nations as desired on advocating for increased provincial and federal regulations on the manufacturing and use of products with contaminants.

MC 6 (Metro Vancouver will continue the receiving and ambient monitoring programs specified in the approved 2002 LWMP, including, but not limited to, recreational water quality (beach monitoring); monitoring near the outfalls for all five wastewater treatment plants, including the extensive deep sea monitoring near the Iona Island plant; and CSO effluent quality and monitoring of small urban streams relating to impacts from urbanization and stormwater.	Continuing	Continuing in Action 8.3 (monitor combined sewer overflow flows and characterize samples from combined sewer overflow discharges); Action 10.1 (Members will use the Stormwater Monitoring and Adaptive Management Framework (AMF) to monitor watershed health); Action 10.4 (align land-use planning and development with IWMPs to ensure development decisions support watershed health objectives, including protecting riparian areas and agricultural areas); Action 12.2 (conduct a regional study of the impacts of densification on watershed health. Members will use the study results to make informed decisions that balance urban growth and ecological resilience.); Action 13.3 (Metro Vancouver will continue to monitor influent and the receiving environment where wastewater treatment plants discharge and assess results to determine whether any actions, such as additional source control or treatment upgrades, are required); Action 19.2 (Metro Vancouver will continue to monitor recreational water quality (seasonal beach monitoring) throughout the region, will continue to share this information with municipal beach operators and local Health Authorities, and will share this information with the First Nations Health Authority)
MC 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 (ISMP). 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.	Continuing	Continuing in Action 10.1 (Members will use the Stormwater Monitoring and Adaptive Management Framework (AMF) to monitor watershed health.); Action 11.3 (Members will implement online rainwater dashboards to report on IWMP progress, including contributions to watershed health). The Biennial Report is being replaced with a short LWMP Annual Report, dashboards, and progress meetings. Refer to reporting commitments described in 'Monitoring and Reporting' Section of this LWMP.
MC 8 Bypass conditions that occur at wastewater treatment plants will be reported out in the annual quality control report. The report on each activity will include a description of the event, cause, environmental effect and monitoring that occurred and any mitigation measures undertaken to prevent reoccurrence and remediate detrimental environment effect.	Continuing	Continuing in Action 14.3 (Metro Vancouver will report on bypass conditions that occur at wastewater treatment plants in the Environmental Management and Quality Control Annual Report. The report on each activity will include a description of the event, cause, and environmental effect.)
MC 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:		
MC 9(a) Have local land use planning consider the direction provided by the ISMPs;	Continuing	Continuing in Action 10.3 (Members will ensure IWMPs integrate rainwater and groundwater management, consider agricultural land rainwater runoff, and reflect the provisions of the Province's *Watershed Security Strategy* once it is launched); Action 10.4 (Members will align land-use planning and development with IWMPs to ensure development decisions support watershed health objectives, including protecting riparian areas and agricultural areas.)
MC 9(b) Consider how the degree, type and location of land development within a drainage can affect the long-term health of the watershed;	Continuing	Continuing in Action 12.2 (Members and Metro Vancouver, as the interagency group, will conduct a regional study of the impacts of densification on watershed health. Members will use the study results to make informed decisions that balance urban growth and ecological resilience.)
MC 9(c) Consider how to protect the stream, including the riparian areas that exert an influence on the stream, from long-term cumulative impacts; and	Continuing	Continuing in Action 10.1 (use the Stormwater Monitoring and Adaptive Management Framework to monitor watershed health); Action 10.3 (Members will ensure IWMPs integrate rainwater and groundwater management, consider agricultural land rainwater runoff, and reflect the provisions of the Province's *Watershed Security Strategy* once it is launched); Action 10.4 (Members will align land-use planning and development with IWMPs to ensure development decisions support watershed health objectives, including protecting riparian areas and agricultural areas).

MC 9(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).	Continuing	Continuing in Action 10.3 (Members will ensure IWMPs integrate rainwater and groundwater management, consider agricultural land rainwater runoff, and reflect the provisions of the Province's *Watershed Security Strategy* once it is launched); Action 10.4 (Members will align land-use planning and development with IWMPs to ensure development decisions support watershed health objectives, including protecting riparian areas and agricultural areas).
MC 10 Metro Vancouver will continue to consult with First Nations during the implementation of the Plan – in particular, engaging, as appropriate, with First Nations likely to be impacted by the secondary upgrades.	Continuing	Continuing in many actions throughout the plan including Actions 1.3 (Metro Vancouver and members will create and update Master Sewer Servicing Plans to accommodate growth and urban development and will continue to ensure that First Nations are engaged appropriately); Action 4.1 (Metro Vancouver will work with First Nations as desired on advocating for increased provincial and federal regulations on the manufacturing and use of products with contaminants.); Action 4.2 (Metro Vancouver and members will continue to motivate residents and businesses to prevent pollution at the source by properly managing what they send down drains and toilets. Metro Vancouver will work with First Nations as desired on such outreach and education.); Action 9.2 (Metro Vancouver will develop intermediate targets on a five-year interval for municipal and regional separation of prioritized combined catchments. The targets will be based on a framework to be developed with Burnaby, New Westminster, Vancouver, and First Nations, that considers key factors such as cultural value, population, redevelopment rates, and operational considerations. Metro Vancouver will submit the targets to the Ministry.); Action 10.1 (Members will use the Stormwater Monitoring and Adaptive Management Framework (AMF) to monitor watershed health: Metro Vancouver will coordinate revising the existing Integrated Watershed Management Plan (IWMP) template, with input from First Nations that have chosen to participate, to incorporate the AMF); Action 10.2 (Members will continue to develop, review and update Integrated Watershed Management Plans (IWMPs): (b) First Nations will participate in IWMP development, monitoring, and review, as desired and mutually agreed upon, including sharing information about their respective land use plans as appropriate); Action 12.4 (Members and Metro Vancouver, as the interagency group, will host a forum at regular intervals to report progress on IWMPs and LWMP rainwater actions, and to foster collaboration and knowledge sharing among members, First Nations, and interested parties.); Action 13.4 (b) (Metro Vancouver will engage with First Nations on planned wastewater treatment upgrades when preparing and updating the Wastewater Treatment Plant Upgrade and Expansion Schedule, and will do so in a manner that is consistent with applicable federal and provincial law, and according to the level of First Nations interest.); Action 15.1 (Metro Vancouver will grow the land application program and will increase public outreach and education, including to First Nations, on how Nutrifor biosolids are used safely and responsibly as fertilizer and as an ingredient to build healthy soil.); Action 16.1 (c) (Metro Vancouver will continue to provide access to sewage and effluent for heat recovery to members, First Nations, and district energy providers, when appropriate.); Action 17.1 (Metro Vancouver will research, develop and pilot new methods to expand the recovery and use of energy, nutrients, water and other emerging resources from the liquid waste system, by: (e) Collaborating with First Nations on pilot projects as desired, and, (f) Conducting public outreach and education about resource recovery, including to First Nations); Action 19.2 (Metro Vancouver will continue to monitor recreational water quality (seasonal beach monitoring) throughout the region, will continue to share this information with municipal beach operators and local Health Authorities, and will share this information with the First Nations Health Authority.); Action 20.1 (Metro Vancouver will participate in relevant collaborative environmental program(s) for regional water bodies (i.e., Fraser River, Burrard Inlet, Strait of Georgia) along with members, First Nations, senior government, and interested parties); and, Action 20.2 (Metro Vancouver will continue to participate, and members may participate, in the Ministry of Environment and Climate Change Strategy processes to review and establish water uses and water quality objectives for specific water bodies within Metro Vancouver.)

Action	Status	Rationale
1.1.1 Review and enhance sewer use bylaws to reduce liquid waste at source, including contaminants identified by the *Canadian Environmental Protection Act*.	Continuing	Continuing in Action 3.3 (pursue reductions in industrial wastewater flow and loading, starting with updating fees in bylaws to create financial incentives that motivate industries to minimize their wastewater discharges) and Action 4.1 (use CWS MMWE risk framework to prioritize contaminants and develop source control actions).
1.1.2 Develop new regulatory instruments, such as Pollution Prevention Plans to complement existing regulations.	Completed	Completed as reported in 2018 Biennial Report Volume 1 (Pollution prevention plan bylaws for different sectors were assessed for feasibility and the *Hospital Pollution Prevention Bylaw* was adopted in 2018).
1.1.3 Increase resources for permitting, and inspection to support and enforce sewer use bylaws.	Completed	Completed as reported in 2015 Biennial Report Appendix A (Between 2010 and 2012, four new enforcement officer positions were created, a new regulatory database was created that improved enforcement efficiency, and paper permitting processes were automated.)
1.1.4 Investigate the implications of the use of domestic food grinders.	Completed Continuing	Completed as reported in 2015 Biennial Report Appendix A (Investigations were completed in 2012 and 2015 and found that grinders were already installed in almost half the residential properties in the region - efforts will continue to reduce the generation of food waste and reduce the disposal of food to sewer). Continuing in Action 3.1 (pursue reductions in residential wastewater flow and loading through improving education and awareness, starting with discouraging disposal of food waste down drains. Members will provide input and assist with implementation).
1.1.5 Develop and implement targeted outreach plans to support liquid waste source control programs.	Completed Continuing	Completed as reported in 2019 Biennial Report Volume 1 and 2023 Biennial Report Volume 1 (several wastewater management guides for commercial operations were published and distributed in 2017 and 2018; and several public communication campaigns — 'Unflushables,' 'Wipe It, Green Bin It,' 'Our Ocean Thanks You,' and others — were conducted from 2019 to 2022). Continuing in Action 3.1 (pursue reductions in residential wastewater flow and loading through improving education and awareness, starting with discouraging disposal of food waste down drains, by encouraging reduction of food waste in general and encouraging use of green bins for kitchen scraps. Members will provide input and assist with implementation) and Action 4.2 (continue to motivate residents and businesses to prevent pollution at the source by properly managing what they send down drains and toilets and continue outreach programs that include youth education programs).
1.1.6 Develop a template to guide the preparation and implementation of inflow and infiltration management plans as part of broader asset management plans and to support sanitary sewer overflow reduction strategies.	Completed Continuing	Completed as reported in 2015 Biennial Report Appendix A (template created in 2011) and as reported in 2023 Biennial Report Volume 1 (template updated in 2022). Continuing in Action 6.1 (develop a consistent inflow and infiltration dashboard with standardized metrics and will incorporate it into the inflow and infiltration management plan template)
1.1.7 Work with the real estate industry and their regulators, and the municipalities to develop and implement a process for the inspection and certification of private sewer laterals being in good condition as a required component of real estate transactions within Metro Vancouver.	Continuing	Continuing in Action 5.2 (require inspection, testing, repair and/or replacement of private laterals when new construction or redevelopment occurs); Action 5.3 (members will conduct inspections of private laterals in existing properties); and Action 5.5 (members to enforce bylaws that require sanitary laterals to be in good condition).

1.1.8 Develop and implement inflow and infiltration management plans that identify reduction strategies and timelines to ensure wet weather inflow and infiltration are within targeted levels.	Completed Continuing	Completed to varying extents by different member jurisdictions (see 2023 Biennial Report Volume 2 - Municipal Reports). Continuing in Action 6.1 (members will complete inflow and infiltration management plans).
1.1.9 Work with municipalities to review historical data and adjust as necessary the average inflow and infiltration allowance for regional trunk sewers and wastewater treatment plants and develop associated target allowances for municipal sewer catchments associated with a 1:5 year return frequency storm event for sanitary sewers to a level that ensures environmental and economic sustainability.	Completed	Completed as reported in 2015 Biennial Report Volume 1. The review of the inflow and infiltration allowance was completed in 2014 and approved by the Regional Engineers Advisory Committee. The regional inflow and infiltration allowance remains unchanged at 11,200 L/ha/d.
1.1.10 Review progress in reducing inflow and infiltration every four years	Continuing	Continuing in Action 6.2 c) (review progress in reducing inflow and infiltration every four years).
1.1.11 Enhance enforcement of sewer use bylaw prohibition against the unauthorized discharge of rainwater and groundwater to sanitary sewers.	Completed	Completed as reported in 2013 Biennial Report Appendix A (*GVS&DD Sewer Use Bylaw No. 299, 2007* contains the prohibition of discharges of stormwater and groundwater to sanitary sewers from industrial, commercial and institutional sources unless authorized in a waste discharge permit).
1.1.12 Work with municipalities to:		
1.1.12 (a) facilitate research on watershed-based stormwater management approaches;	Completed Continuing	Completed as reported in 2013, 2019, and 2023 Biennial Reports. Watershed-based stormwater management approaches were explored and implemented to varying degrees throughout the last plan - especially through the Stormwater Interagency Liaison Group. Continuing in Action 12.1 (interagency group will lead local research on rainwater management).
1.1.12 (b) identify improvements to stormwater bylaws to include on-site rainwater management requirements;	Continuing	Continuing in Action 11.2 (a guidance document will be developed to aid members in harmonizing rainwater policies, programs and bylaws; members will review and update rainwater policies, programs and bylaws).
1.1.12 (c) develop model utility design standards and options for neighbourhood design guidelines;	Completed	Completed in 2012 (reported in 2013 Biennial Report, Appendix A). Stormwater Source Control Design Guidelines were updated to include sizing and design methodologies for members to reference, incorporate, or adapt for their standards and guidelines. See https://metrovancouver.org/services/liquid-waste/Documents/stormwater-source-control-design-guidelines-2012.pdf
1.1.12 (d) establish region-wide baseline criteria for on-site rainfall management including variations for localized geology, rainfall and watershed conditions;	Completed	Completed in 2017 (reported in 2019 Biennial Report, Volume 1). See https://metrovancouver.org/services/liquid-waste/Documents/region-wide-baseline-onsite-stormwater-management-report-2017-02.pdf
1.1.12 (e) establish mechanisms to ensure continued performance of on-site rainwater management systems; and	Completed Continuing	Completed in 2012 and 2017 as part of Actions 1.1.12 (c) and (d). Generalized performance requirements for on-site stormwater management were identified in 2012 and following GVS&DD Board endorsement of the Region-wide Baseline for On-Site Stormwater Management in 2017, the Stormwater Interagency Liaison Committee continued to work to identify specific issues and mechanisms that support the long-term performance of on-site rainwater management systems. Continuing in Action 11.2 (review and update rainwater bylaws, programs and policies).

1.1.12 (f) work with senior governments and industry to develop codes of practice, certification, guidelines and standards which support this plan.	Continuing	Continuing in Action 11.2 c) (coordinate and advocate with other levels of government to resolve rainwater policy conflicts and barriers) and Action 11.4 (coordinate an approach for updating the Master Municipal Construction Documents).
1.1.13 Decrease liquid waste volumes through complementary initiatives in the Metro Vancouver Drinking Water Management Plan to reduce potable water consumption.	Continuing	Continuing in Action 3.5 (Metro Vancouver and members will advance water conservation and water metering).
1.1.14 Review and enhance sewer use bylaws to reduce liquid waste at source, including contaminants identified by the *Canadian Environmental Protection Act*.	Completed Continuing	This member action was completed to varying extents by different member jurisdictions through revisions and updates to municipal stormwater, sediment and sewer and drainage system bylaws (see 2023 Biennial Report Volume 2). Continuing in Action 3.4 (provide guidance to enable members to manage fats, oils, and grease through their own bylaws) and Action 11.2 (update rainwater policies, programs, and bylaws in a harmonized manner).
1.1.15 Continue existing programs of permitting and inspection to support and enforce sewer use bylaws.	Removed	This member action is removed from the LWMP because, being unique to the City of Vancouver as the only member jurisdiction with GVS&DD Board designated enforcement officers, the coordination of GVS&DD regulatory bylaw enforcement is completed between City of Vancouver and Metro Vancouver on an ongoing basis, separate from the LWMP.
1.1.16 Identify and regulate pesticides and lawn care products which negatively affect rainwater runoff quality and urban stream health	Completed Continuing	Completed to varying extents by different member jurisdictions through revisions and updates to municipal stormwater, sediment and sewer and drainage system bylaws (see 2023 Biennial Report Volume 2). Continuing in Action 11.2 (coordinate the development of a guidance document to aid members in harmonizing rainwater policies, programs and bylaws; members will review and update rainwater policies, programs and bylaws).
1.1.17 Continue outreach plans to support liquid waste source control programs.	Completed Continuing	Completed to varying extents by different member jurisdictions (see 2023 Biennial Report Volume 2 - Municipal Reports). Continuing in Action 3.1 (pursue reductions in residential wastewater flow and loading through improving education and awareness) and Action 4.2 (continue to motivate residents and businesses to prevent pollution at the source through outreach programs that include youth education programs).
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.	Completed Continuing	Completed to varying extents by different member jurisdictions (see 2023 Biennial Report Volume 2). Continuing in Action 6.1 (members will complete inflow and infiltration management plans).
1.1.19 Enhance enforcement of sewer use bylaw prohibition against the unauthorized discharge of rainwater and groundwater to sanitary sewers.	Continuing	Continuing in Action 5.5 (members to enforce bylaws on private property to prevent the unauthorized discharge of rainwater and groundwater to sanitary sewers).

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.	Completed Continuing	Completed to varying extents by different member jurisdictions (see 2023 Biennial Report Volume 2 - Municipal Reports). Continuing in Action 11.2 (coordinate the development of a guidance document to aid members in harmonizing rainwater policies, programs and bylaws; members will review and update rainwater policies, programs and bylaws).
1.1.21 Update municipal utility design standards and neighbourhood design guidelines to enable and encourage on-site rainwater management.	Completed Continuing	Completed to varying extents by different member jurisdictions (see 2023 Biennial Report Volume 2 - Municipal Reports). Continuing in Action 11.4 (coordinate an approach for seeking to update the Master Municipal Construction Documents such that green infrastructure guidelines become standards).
1.2.1 Prohibit the construction of new combined sewer systems other than those functioning as part of a strategy to reduce combined sewer overflows or to manage stormwater quality.	Continuing	Continuing in Action 9.1 (ensure that no new combined sewer laterals will be constructed on private or public property).
1.2.2 Address the Canada-wide Strategy for the Management of Municipal Wastewater Effluent (CWS-MMWE) by working with Burnaby, New Westminster and Vancouver to develop and implement: priorities for sewer separation of catchments tributary to combined sewer outfalls; regional and municipal sequence for trunk and collector sewer separation; strategic use of existing combined sewers to manage rainwater quality runoff; and a strategy to separate combined sewer connections from private properties.	Continuing	Continuing in Action 9.2 and Action 9.3 (develop targets for separation on five-year intervals; develop and implement Sewer Separation and Combined Sewer Overflow Elimination Plans to prevent combined sewer overflows, and in the interim, support the intermediate targets developed in action 9.2).
1.2.3 Replace combined regional trunk sewers with separated sanitary and storm sewers as determined by the plans developed in 1.2.2.	Continuing	Continuing in Action 9.2 and Action 9.4 (develop targets for separation on five-year intervals; replace combined regional trunk sewers with separated sanitary and storm sewers as determined by the Sewer Separation Plans).
1.2.4 Work with municipalities to develop and implement municipal-regional sanitary overflow management plans which will: prevent sanitary overflows resulting from heavy rain and snowmelt occurring less than once every five years (for a 24 hour duration event); reduce emergency overflows due to power outages; and identify locations and schedules for appropriate system capacity improvements, wet weather containment, and point treatment and discharge to receiving waters of chronic overflows, including Cloverdale Pump Station, Katzie Pump Station, Lynn Pump Station.	Completed Continuing	Completed to varying extents by members and Metro Vancouver as reported in 2023 Biennial Report (for example, in the work of the REAC Liquid Waste Sub-Committee SSO Working Group). Continuing in Action 7.5 (continue to develop and implement municipal-regional sanitary overflow management plans to eliminate overflows at chronic locations).
1.2.5 Work with Metro Vancouver to develop and implement municipal-regional sanitary overflow management plans as set out in 1.2.4.	Completed Continuing	Completed to varying extents by members and Metro Vancouver as reported in 2023 Biennial Report (for example, in the work of the REAC Liquid Waste Sub-Committee SSO Working Group). Continuing in Action 7.5 (continue to develop and implement municipal-regional sanitary overflow management plans to eliminate overflows at chronic locations).

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 per cent and 1.5 per cent of the system per year in the Vancouver Sewerage Area and Fraser Sewerage Area respectively.	Continuing	Continuing in Action 9.3 (Burnaby, New Westminster, and Vancouver continue to work with Metro Vancouver to develop and implement Sewer Separation and Combined Sewer Overflow Elimination Plans to prevent combined sewer overflows, and in the interim, support the intermediate targets developed in action 9.2).
1.3.1 Develop and implement operational plans for sewerage and wastewater treatment facilities to ensure infrastructure reliability and optimal performance.	Continuing	Continuing in Action 1.1 (maintain the condition and performance of the sewerage system to serve a growing population in a changing climate) and Action 2.3 (plan, locate, design, and adapt infrastructure, assets, and operations to address identified hazards, risks, and vulnerabilities, including climate change impacts).
1.3.2 Maintain trunk sanitary sewer capacity for dry weather sewage conveyance levels plus the Metro Vancouver target inflow and infiltration allowance; as necessary upgrade trunk sewer systems to maintain hydraulic gradelines and safe operating levels which have been established based on measured flow.	Continuing	Continuing in Action 1.2 (regional and municipal systems will seek to accommodate population growth and land use changes by providing sanitary sewer capacity and wastewater treatment plant hydraulic capacity for peak dry weather flow plus an inflow and infiltration allowance of 11,200 L/ha/d).
1.3.3 Work with municipalities 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.	Removed	Removed. Emergency management planning is regularly conducted as part of ongoing operations as required under British Columbia's *Emergency and Disaster Management Act* and no longer needs to be included in the LWMP.
1.3.4 Operate wastewater treatment plants which have secondary level treatment (Annacis Island, Lulu Island, North West Langley wastewater treatment plants) to meet requirements specified in each facility's Operating Certificate and the Canada-wide Strategy for the Management of Municipal Wastewater Effluent (CWS-MMWE) National Performance Standards for wastewater effluent, including:	Continuing	Continuing in Action 13.1 (wastewater treatment infrastructure will be operated using the CWS-MMWE Environmental Risk Management Framework) and 14.1 (wastewater treatment plants will meet or surpass requirements specified in each facility's Operational Certificate and the CWS-MMWE National Performance Standards for wastewater effluent).
1.3.4 (a) monthly average maximum Carbonaceous Biochemical Oxygen Demand (CBOD5): 25 mg/L; and	Removed	Specific wastewater treatment plant effluent quality criteria are established in Operational Certificates issued by the Province for each wastewater treatment plant and may be revised from time to time. These specific concentrations should be removed from the LWMP to prevent them from becoming outdated if/when Operational Certificates are revised or updated.
1.3.4 (b) monthly average maximum Total Suspended Solids (TSS): 25 mg/L.	Removed	Specific wastewater treatment plant effluent quality criteria are established in Operational Certificates issued by the Province for each wastewater treatment plant and may be revised from time to time. These specific concentrations should be removed from the LWMP to prevent them from becoming outdated if/when Operational Certificates are revised or updated.
1.3.5 Upgrade or replace Lions Gate (North Shore Sewerage Area) and Iona Island (Vancouver Sewerage Area) wastewater treatment plants to secondary level treatment to meet Canada-wide Strategy for the Management of Municipal Wastewater Effluent (CWS-MMWE) requirements and timelines.	Continuing	Continuing in Action 13.1 (wastewater treatment infrastructure will be operated using the CWS-MMWE Environmental Risk Management Framework). Continuing in Action 13.4 (upgrade wastewater treatment processes and plants according to the Wastewater Treatment Plant Upgrade and Expansion Schedule).

1.3.5 (a) The intended site for the North Shore Sewerage Area secondary facility is the Metro Vancouver owned property located between Pemberton, Philips, and McKeen Avenues and West First Street in the District of North Vancouver. The existing outfall will be retained as part of the upgraded facility. The outfall discharges to embayed marine waters as defined in the *Environmental Management Act*, *Municipal Sewage Regulation*.	Removed	This sub-action is removed from the LWMP as specifics regarding the siting of the North Shore Wastewater Treatment Plant and outfall are outdated.
1.3.5 (b) The intended site for the Vancouver Sewerage Area is the property immediately adjacent and east of the existing Iona Island plant in the City of Richmond. The existing outfall will be retained as part of the upgraded facility. The outfall discharges to open marine waters as defined in the *Environmental Management Act, Municipal Sewage Regulation*.	Removed	This sub-action is removed from the LWMP as specifics regarding the siting of the Iona Island Wastewater Treatment Plant and outfall are addressed separately.
1.3.5 (c) Based on the CWS-MMWE and the assessment made by the Environmental Monitoring Committee, the Lions Gate upgrade should be completed within 10-years subject to the appropriate financial arrangements being in place as indicated in the Financial Plan.	Removed	This sub-action is removed from the LWMP as specifics regarding the North Shore Wastewater Treatment Plant (previously Lions Gate) upgrade are addressed separately.
1.3.5 (d) Based on the CWS-MMWE and the assessment made by the Environmental Monitoring Committee, the Iona Island upgrade should be completed within 20 years. In spite of this, Metro Vancouver has a strong desire to accelerate the completion of the Iona Island upgrade as soon as is reasonably possible in a 10 to 20 year timeframe, because of the significance of this upgrade to Metro Vancouver's Sustainable Region Initiative. The Region will strive to the greatest extent possible to achieve this. Risk factors to overcome include resolution of technical and land tenure issues, construction logistics and will be subject to appropriate financial arrangements being in place as indicated in the Financial Plan. In collaboration with provincial and federal governments, Metro Vancouver will engage in resolving these obstacles to complete the Iona Island upgrade at the earliest practicable time.	Removed	This sub-action is removed from the LWMP as specifics regarding the Iona Island Wastewater Treatment Plant upgrade are addressed separately.
1.3.5 (e) Metro Vancouver will seek assistance from both senior levels of government in resolving First Nations rights and title issues associated with these secondary treatment plant upgrades.	Continuing	Continuing in Action 13.4 (b) (Metro Vancouver will engage with First Nations on planned wastewater treatment upgrades when preparing and updating the Wastewater Treatment Plant Upgrade and Expansion Schedule, and will do so in a manner that is consistent with applicable federal and provincial law, and according to the level of First Nations interest).
1.3.6 Maintain interim maximum daily concentration limits for wastewater effluent of 130 mg/L BOD_5 at both Lions Gate and Iona Island plants and 130 mg/L TSS at Lions Gate and 100 mg/L TSS at Iona Island until such time as secondary treatment is operational, and operate the plants to meet requirements specified in each facility's Operating Certificate.	Continuing	Continuing in Action 13.1 (wastewater treatment infrastructure will be operated using the CWS-MMWE Environmental Risk Management Framework) and 14.1 (wastewater treatment plants will meet or surpass requirements specified in each facility's operating certificate and the CWS-MMWE National Performance Standards for wastewater effluent).

1.3.7 Assess environmental monitoring results (see Strategy 3.3) to determine whether any actions are required to meet Ministry of Environment/ Canada-wide Strategy for the Management of Municipal Wastewater Effluent (CWS-MMWE) requirements.	Continuing	Continuing in Action 13.1 (wastewater treatment infrastructure will be operated using the CWS-MMWE Environmental Risk Management Framework), Action 13.2 (continue to monitor the quantity and characteristics of Metro Vancouver's wastewater treatment plant effluent discharges and assess effluent quality in accordance with the CWS-MMWE) and Action 13.3 (continue to monitor influent and the receiving environment where wastewater treatment plants discharge and assess results to determine whether any actions, such as additional source control or treatment upgrades, are required).
1.3.8 Continue odour control programs at wastewater treatment plants and implement odour control programs for targeted facilities in the regional sewer system and for relevant energy and material recovery processes (see Action 3.3.4).	Continuing	Continuing in Action 18.5 (continue odour management programs at wastewater treatment plants and targeted facilities in the regional sewer system).
1.3.9 Develop and implement air emissions management programs for standby power generators and biogas production, including assessment of desirability of retrofit and accelerated asset replacement where appropriate.	Continuing	Continuing in Action 18.3 (manage air emissions from standby power generators) and Action 18.4 (develop and undertake a program to characterize emissions from various processes at wastewater treatment plants (e.g., digesters, exhausts, stacks) during operation, preventative maintenance, and emergency maintenance. Metro Vancouver will identify potential concerns, and, where appropriate, undertake studies of best economically feasible control processes or technologies).
1.3.10 Develop and implement programs to reduce greenhouse gas emissions from the regional liquid waste management systems to help achieve federal, provincial and Metro Vancouver greenhouse gas targets (see Action 3.3.4).	Continuing	Continuing in Action 18.2 (continue to develop and implement programs and procurement policies to reduce greenhouse gas emissions associated with the design, construction, operation, and management of wastewater collection and treatment systems, to help achieve federal, provincial, and Metro Vancouver greenhouse gas reduction targets).
1.3.11 Develop and implement operational plans for municipal sewerage facilities to ensure infrastructure reliability and optimal performance.	Continuing	Continuing in Action 1.1 (maintain the condition and performance of the sewerage system to serve a growing population in a changing climate) and Action 2.3 (continue to plan, locate, design, and adapt infrastructure, assets, and operations to address identified hazards, risks, and vulnerabilities, including climate change impacts).
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.	Removed	Removed. Emergency management planning is regularly conducted as part of ongoing operations as required under British Columbia's *Emergency and Disaster Management Act* and no longer needs to be included in the LWMP.
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.	Completed Continuing	Completed to varying extents if applicable by different member jurisdictions as reported in Biennial reports. Continuing in Action 20.3 (same as 2011 ILWRMP).
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.	Completed Continuing	Completed to varying extents if applicable by different member jurisdictions as reported in Biennial reports. Continuing in Action 20.4 (same as 2011 ILWRMP).

1.3.15 Continue existing municipal odour control programs and implement new programs for targeted municipal sewer facilities (see Action 3.3.4).	Completed Continuing	Completed to varying extents by different member jurisdictions as reported in Biennial reports. Continuing in Action 18.6 (continue existing municipal odour control programs and implement new programs for targeted municipal sewer facilities).
1.3.16 Develop and implement air emissions management programs for standby power generators at municipal sewer pump stations.	Continuing	Continuing in Action 18.3 (continue to develop and implement air emissions management programs for standby power generators at municipal sewer pump stations).
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 (see Action 3.3.4).	Continuing	Continuing in Action 18.2 (continue to develop and implement programs and procurement policies to reduce greenhouse gas emissions associated with the design, construction, operation, and management of wastewater collection and treatment systems, to help achieve federal, provincial, and Metro Vancouver greenhouse gas reduction targets).
1.3.18 Include Metro Vancouver and municipalities in the Ministry's processes to review and establish official water uses and official water quality objectives for specific water bodies within Metro Vancouver.	Completed Continuing	Completed as reported in 2023 Biennial Report Volume 1 (Metro Vancouver was invited by the Ministry of Environment and Climate Change Strategy and səlilwətaɬ (Tsleil-Waututh Nation) to participate in the review of Burrard Inlet Water Quality Objectives and has provided monitoring, other data, and feedback on the proposed objectives). Continuing in Action 20.2 (participate in provincial processes to review and establish water uses and water quality objectives for specific water bodies within Metro Vancouver).
2.1.1 Assess each sewerage area using an integrated resource recovery business case model that:	Completed	Integrated Resource Recovery business case models and reports were completed for all four sewerage areas from 2011 to 2023.
2.1.1 (a) evaluates opportunities to expand the recovery of energy, nutrients and water from the liquid waste system; specifically:		
2.1.1 (a) 1 · energy from biogas at wastewater treatment plants including investigating new sludge and wastewater treatment technologies and the co-digestion of other organic wastes such as organics in municipal solid waste, oils and greases;	Completed Continuing	Completed as reported in 2013, 2015, and 2019 Biennial reports - trucked liquid wastes were evaluated for energy-generating potential through the Annacis Co-Digestion Program and a review of Metro Vancouver's Trucked Liquid Waste Program. Findings indicated that Metro Vancouver cannot compete with the private sector for the types of waste best suited for co-digestion and energy generation. Continuing in Action 16.1 (recover energy from the liquid waste system); Action 17.1 (new methods to expand recovery and use of energy, nutrients, water, and other resources from the liquid waste system).
2.1.1 (a) 2 · heat energy from new pump stations, sewer replacement and rehabilitation and major wastewater treatment plant projects;	Continuing	Continuing in Action 16.1 (recover energy from the liquid waste system); Action 17.1 (new methods to expand recovery and use of energy, nutrients, water, and other resources from the liquid waste system).
2.1.1 (a) 3 · biodiesel from trucked liquid waste, waste grease and sewer grease.	Completed	Completed as reported in 2013, 2015, and 2019 Biennial reports - trucked liquid wastes were evaluated for energy-generating potential through the Annacis Co-Digestion Program and a review of Metro Vancouver's Trucked Liquid Waste Program. Findings indicated that Metro Vancouver cannot compete with the private sector for the types of waste best suited for co-digestion and energy generation.

2.1.1 (a) 4 · energy from biosolids and sludge;	Continuing	Continuing in Action 15.2 (beneficially use dried Nutrifor biosolids pellets as a low carbon fuel and fertilizer product); Action 15.3 (explore technologies that convert sludge to low carbon fuel), Action 15.4 (process biosolids at Metro Vancouver Waste-to-Energy Facility when other markets or uses cannot be accessed); Action 16.1 (recover energy from the liquid waste system); Action 17.1 (new methods to expand recovery and use of energy, nutrients, water, and other resources from the liquid waste system).
2.1.1 (a) 5 · nutrients, such as phosphorous from liquid waste and biosolids; and	Continuing	Continuing in Action 15.1 (grow the land application program); Action 15.2 (beneficially use dried Nutrifor biosolids pellets as a low carbon fuel and fertilizer product); Action 16.3 (recover nutrients and other materials from liquid waste); Action 17.1 (new methods to expand recovery and use of energy, nutrients, water, and other resources from the liquid waste system).
2.1.1 (a) 6 · alternatives to potable water for non-drinking purposes, such as rainwater harvesting, greywater reuse and reclaimed treated wastewater;	Continuing	Continuing in Action 16.2 (recover water from the liquid waste system); Action 17.1 (new methods to expand recovery and use of energy, nutrients, water, and other resources from the liquid waste system).
2.1.1 (b) identifies linkages between liquid waste resource recovery opportunities and other systems (solid waste, drinking water, land use/buildings, parks, air quality, energy); and	Completed	Completed as reported in 2022 biennial report. Linkages between liquid waste resource recovery opportunities and other systems (solid waste, drinking water, land use/buildings, parks, air quality, energy) were assessed in Integrated Resource Recovery studies completed for each sewerage area from 2011 to 2023. Linkages between the liquid waste system and other regional systems are described in the 'Alignment and Linkages' section of this LWMP.
2.1.1 (c) develops and evaluates business cases for integrated resource recovery/use opportunities.	Completed	Integrated Resource Recovery business case models and reports were completed for all four sewerage areas from 2011 to 2023.
2.1.2 Implement appropriate business cases based on the results of 2.1.1.	Continuing	Continuing in Action 16.1 (recover energy from the liquid waste system); Action 16.2 (recover water from the liquid waste system); Action 16.3 (recover nutrients and other materials from liquid waste).
2.1.3 Work with municipalities to adapt plans and infrastructure for long term needs based on the results of 2.1.1.	Continuing	Continuing in Action 16.1 (recover energy from the liquid waste system); Action 16.2 (recover water from the liquid waste system); Action 16.3 (recover nutrients and other materials from liquid waste).
2.1.4 Work with Metro Vancouver to give effect to 2.1.1, 2.1.2 and 2.1.3.	Continuing	Continuing in Action 15.5 (members will continue to use Nutrifor landscaping soil in municipal projects when feasible); Action 16.4 (members will recover and use recovered energy and water when feasible)
3.1.1 Assess the performance and condition of regional sewerage systems by:	Continuing	Continuing in Action 1.1 (maintain the condition and performance of the sewerage system to serve a growing population in a changing climate).
3.1.1 (a) inspecting regional sanitary sewers on a twenty-year cycle; and	Continuing	Continuing in Action 1.1 (maintain the condition and performance of the sewerage system to serve a growing population in a changing climate).
3.1.1 (b) maintaining current maps of sewerage inspection, condition, and repairs.	Continuing	Continuing in Action 1.1 (maintain the condition and performance of the sewerage system to serve a growing population in a changing climate).

3.1.2 Create incentives to reduce inflow and infiltration by adjusting Tier I sewerage cost allocation formulae within each sewerage area from an average dry weather flow basis (25th percentile) to average wet weather flow (75th percentile) with appropriate adjustments for combined sewerage areas. Tier II cost allocation would remain unchanged.	Completed Continuing	Completed as reported in 2023 Biennial Report Volume 1 (Wet Weather Pricing was approved by the GVS&DD Board in February 2023). Continuing in Action 6.4 (Metro Vancouver will review the wet weather sewer pricing formula every four years, and will adjust if needed to further incentivize inflow and infiltration reductions by members).
3.1.3 In consultation with municipalities, review Metro Vancouver's safe-operating head for regional sewers.	Continuing	Continuing in Action 1.2 (provide sanitary sewer and wastewater treatment plant hydraulic capacity for peak dry weather flow plus an inflow and infiltration allowance of 11,200 L/ha/d, to ensure hydraulic gradelines stay within safe operating levels).
3.1.4 Develop and implement asset management plans targeting a 100 year replacement or rehabilitation cycle for regional sewerage infrastructure.	Continuing	Continuing in Action 1.1 c) (continue to develop and implement asset management plans that address risks, including climate change and seismic events, and target a 100-year replacement or rehabilitation cycle for sewerage infrastructure).
3.1.5 Update and implement asset management plans for wastewater treatment plants which address risks, including climate change and seismic events, and maintain performance in wet weather.	Continuing	Continuing in Action 1.1 (continue to develop and implement asset management plans that address risks, including climate change and seismic events, and target a 100-year replacement or rehabilitation cycle for sewerage infrastructure) and Action 14.2 (update and implement asset management plans to enhance the operational efficiency of wastewater treatment plants, maintain the reliability of the existing infrastructure and equipment for wastewater treatment plants that address risks, including climate change and seismic events, and maintain performance in wet weather).
3.1.6 Assess the performance and condition of municipal sewerage systems by:	Continuing	Continuing in Action 1.1 (maintain the condition and performance of the sewerage system to serve a growing population in a changing climate).
3.1.6 (a) inspecting municipal sanitary sewers on a twenty-year cycle;	Continuing	Continuing in Action 1.1 a) (maintain the condition and performance of the sewerage system by inspecting sanitary sewers on a 20-year cycle;)
3.1.6 (b) maintaining current maps of sewerage inspection, condition and repairs; and	Continuing	Continuing in Action 1.1 b) (maintain the condition and performance of the sewerage system by maintaining current maps of sewerage inspection, condition, and repairs;)
3.1.6 (c) using the Metro Vancouver "Sewer Condition Reporting Template Standard Report, November 2002" as a guide to ensure a consistent approach to sewer system evaluation and reporting.	Continuing	Continuing in Action 1.1 (Metro Vancouver will use the National Association of Sewer Service Companies Pipeline Assessment Certification Program and Manhole Assessment Certification Program for (a) and (b). Members are encouraged to use these programs for (a) and (b) to ensure a consistent approach).
3.1.7 Work with Metro Vancouver to give effect to 3.1.2, 3.1.3 and 3.1.4.	Completed Continuing	Completed as reported in 2023 Biennial Report Volume 1 (Wet Weather Pricing was approved by the GVS&DD Board in February 2023). Continuing in Action 1.1 (continue to develop and implement asset management plans that address risks, including climate change and seismic events, and target a 100-year replacement or rehabilitation cycle for sewerage infrastructure); Action 1.2 (provide sanitary sewer and wastewater treatment plant hydraulic capacity for peak dry weather flow plus an inflow and infiltration allowance of 11,200 L/ha/d, to ensure hydraulic gradelines stay within safe operating levels); and Action 6.4 (review the wet weather sewer pricing formula every four years, and adjust if needed to further incentivize inflow and infiltration reductions my members).

3.1.8 Develop and implement asset management plans targeting a 100 year replacement or rehabilitation cycle for municipal sewerage infrastructure and provide copies of such plans to Metro Vancouver.	Continuing	Continuing in Action 1.1 (c) (continue to develop and implement asset management plans that address risks, including climate change and seismic events, and target a 100-year replacement or rehabilitation cycle for sewerage infrastructure).
3.2.1 With financial support from provincial and federal governments and the University of British Columbia, develop the Annacis Island Sustainability Academy to support innovative research and demonstration projects in liquid waste management.	Completed	Completed as reported in 2023 Biennial Report Volume 1 (The Annacis Research and Event Centre supports technology trials, training, conferences and education with wastewater treatment technology projects conducted in partnership with the University of British Columbia, the Vancouver Aquarium and other agencies, private firms, and academic institutions).
3.2.2 Collaborate with local and senior governments, academic institutions and industry in research on wastewater treatment technology and stormwater management and associated demonstration projects, training and development of educational toolkits.	Completed Continuing	Completed as reported in 2023 Biennial Report Volume 1 (Three innovative wastewater treatment technology research and pilot projects were highlighted: Hydrothermal Processing Demonstration facility, Lulu Island Pilot Digestion Optimization Facility, Advanced Resource Recovery from Wastewater [a five-year Industry Research Chair program at the University of British Columbia Okanagan co-funded by Natural Sciences and Engineering Research Council and Metro Vancouver]). Continuing in Action 17.1 (research, develop and pilot new methods through collaborating with researchers at academic institutions and other utilities and water research organizations); Action 17.2 (foster circular water economy innovation within the liquid waste system by promoting circular water economy innovation and research through sharing our story and actively participating in industry organizations and regional networks).
3.2.3 Undertake an annual internal audit of best practices of one regional liquid waste management sub program and environmental management system to identify opportunities for innovation and improvements.	Removed	Removed. Replaced by updated actions that require ongoing continuous improvement, monitoring and accountability. For more information, see 'Monitoring and Reporting' Section of this LWMP.
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.	Removed	Removed. Replaced by updated actions that require ongoing continuous improvement, monitoring and accountability. For more information, see 'Monitoring and Reporting' Section of this LWMP.
3.3.1 Continue to monitor the ambient environment conditions of relevant water bodies in the region in conformance with the Canada-wide Strategy for the Management of Municipal Wastewater Effluent (CWS-MMWE) requirements, and work with the Ministry of Environment in developing Environmental Quality Objectives.	Continuing	Continuing in Action 13.3 (continue to monitor influent and the receiving environment where wastewater treatment plants discharge and assess results to determine whether any actions, such as additional source control or treatment upgrades, are required); Action 20.2 (Metro Vancouver will continue to participate, and members may participate, in provincial processes to review and establish water uses and water quality objectives for specific water bodies within Metro Vancouver).
3.3.2 (Part 1) Continue to monitor the quantity and characteristics of Metro Vancouver's liquid waste point discharges to the environment	Continuing	Continuing in Action 13.2 (continue to monitor the quantity and characteristics of Metro Vancouver's wastewater treatment plant effluent discharges and assess effluent quality in accordance with the CWS-MMWE).

3.3.2 (Part 2) Continue to monitor Metro Vancouver's conformance with the Canada-wide Strategy for the Management of Municipal Wastewater Effluent (CWS-MMWE) requirements to meet Environmental Discharge Objectives.	Continuing	Continuing in Action 13.2 (continue to monitor the quantity and characteristics of Metro Vancouver's wastewater treatment plant effluent discharges and assess effluent quality in accordance with the CWS-MMWE).
3.3.3 Continue to operate its regional data collection network for sewers, rainfall and streams and use that data to assess the effectiveness of actions taken under this plan.	Continuing	Continuing in Action 6.3 (monitor municipal sewer flows and levels in their existing network to inform their inflow and infiltration dashboards. Members will expand the monitoring network if needed to better understand where inflow and infiltration is happening); Action 8.9 (maintain monitors at combined sewer overflow sites); Action 10.1 (use the Stormwater Monitoring and Adaptive Management Framework (AMF) to monitor watershed health); Action 10.2 (continue to develop, review and update Integrated Watershed Management Plans (IWMPs)).
3.3.4 In collaboration with municipalities, estimate and document the greenhouse gas emissions and odours associated with the operation of the municipal and regional liquid waste management systems (see Actions 1.3.8, 1.3.10, 1.3.15, and 1.3.17).	Continuing	Continuing in Action 18.5 (continue odour management programs at wastewater treatment plants and targeted facilities in the regional sewer system); Action 18.6 (continue existing municipal odour control programs and implement new programs for targeted municipal sewer facilities); Action 18.1 (develop and implement programs and policies to track greenhouse gas emissions associated with the construction and operation of wastewater collection and treatment systems, including developing and implementing new monitoring plans where necessary).
3.3.5 Estimate and report on the frequency, location and volume of sewage overflows from regional combined and sanitary sewers, and where feasible identify and address the probable causes.	Continuing	Continuing in Action 7.3 (report annually on the number and location of sanitary sewer overflows, and, where feasible, the estimated volumes and probable causes); and Action 8.2 (estimate and report annually on the frequency, location and volume of sewage overflows from regional combined sewers, and where feasible identify and address the probable causes)
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.	Continuing	Continuing in Action 18.5 (continue odour management programs at wastewater treatment plants and targeted facilities in the regional sewer system); Action 18.6 (continue existing municipal odour control programs and implement new programs for targeted municipal sewer facilities); Action 18.1 (develop and implement programs and policies to track greenhouse gas emissions associated with the construction and operation of wastewater collection and treatment systems, including developing and implementing new monitoring plans where necessary).
3.3.7 Estimate and report on the frequency, location and volume of sewage overflows from municipal combined and sanitary sewers, and where feasible identify and address the probable causes.	Continuing	Continuing in Action 7.3 (report annually on the number and location of sanitary sewer overflows, and, where feasible, the estimated volumes and probable causes); and Action 8.4 (Members with combined systems will continue to estimate and report annually on the frequency, location and volume of combined sewer overflows from municipal sewers, and where feasible identify and address the probable causes).
3.3.8 Maintain and, if necessary, expand the existing municipal sewer flow and sewer level monitoring network.	Continuing	Continuing in Action 6.3 (monitor municipal sewer flows and levels in their existing network to inform their inflow and infiltration dashboards. Members will expand the monitoring network if needed to better understand where inflow and infiltration is happening).
3.4.1 Design and adapt infrastructure and operations to address identified risks and long-term needs including risks associated with climate change.	Continuing	Continuing in Action 13.1 (plan, design, operate and maintain wastewater treatment infrastructure using the CWS-MMWE Environmental Risk Management Framework to address and adapt to identified risks and long term needs, and will additionally incorporate risks associated with climate change into the framework).

3.4.2 In collaboration with municipalities 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, including identifying and maintaining a system of emergency wastewater overflow locations.	Removed	Removed. Emergency management planning is regularly conducted as part of ongoing operations as required under British Columbia's *Emergency and Disaster Management Act* and no longer needs to be included in the LWMP.
3.4.3 Ensure liquid waste infrastructure and services are provided in accordance with the Regional Growth Strategy and coordinated with municipal Official Community Plans.	Continuing	Continuing in Action 1.4 (Metro Vancouver and members' provision of liquid waste infrastructure and services will be consistent with the Regional Growth Strategy and coordinated with municipal Official Community Plans).
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.	Removed	Removed. Emergency management planning is regularly conducted as part of ongoing operations as required under British Columbia's *Emergency and Disaster Management Act* and no longer needs to be included in the LWMP.
3.4.5 Adapt infrastructure and operations to address risks and long-term needs.	Continuing	Continuing in Action 2.3 (continue to plan, locate, design, and adapt infrastructure, assets, and operations to address identified hazards, risks, and vulnerabilities, including climate change impacts).
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.	Continuing	Continuing in Action 1.4 (Metro Vancouver and members' provision of liquid waste infrastructure and services will be consistent with the Regional Growth Strategy and coordinated with municipal Official Community Plans).
3.4.7 Develop and implement integrated stormwater management plans at the watershed scale that integrates with land use to manage rainwater runoff	Continuing	Continuing in Action 10.4 (align land-use planning and development with IWMPs to ensure development decisions support watershed health objectives, including protecting riparian areas and agricultural areas).
3.5.1 Establish a new overarching committee, the Integrated Utility Management Advisory Committee (IUMAC), to advise Metro Vancouver on plan implementation, particularly from the perspectives of integrated planning and resource recovery across utility systems.	Removed	The structure of the Integrated Utility Management Advisory Committee was appropriate for the 2011 LWMP at the time of development and adoption. The REAC Liquid Waste Sub-Committee (staff representatives from Metro Vancouver and member jurisdictions) is better suited to track ongoing progress on member actions in the LWMP. Progress on Metro Vancouver actions in this LWMP will be discussed and tracked through meetings with the Province. Refer to 'Monitoring and Reporting' section of the LWMP for more information.
3.5.2 Continue to receive advice from the Environmental Monitoring Committee (EMC) and Stormwater Interagency Liaison Group (SILG) as subcommittees under the IUMAC.	Removed Continuing	The Integrated Utility Management Advisory Committee no longer exists so reference to this committee is removed. Continuing in Action 12.1 (coordinate a revision of the interagency group's terms of reference, possibly to operate as a sub-committee under the Regional Engineer's Advisory Committee (REAC), to lead local research on rainwater management, to be the primary regional advocate with regulators, to promote education and outreach on rainwater management, and to coordinate region-wide accountability on IWMP actions); and Action 19.1 (continue to receive advice from the Environmental Monitoring Committee).

3.5.3 Use the Burrard Inlet Environmental Action Program and the Fraser River Estuary Management Program Management Committee (BIEAP-FREMP) as the senior level forum for discussion of policy and assessment of the scientific work related to the plan, and for resolving toxicity concerns and any disputes among its members related to implementing the plan.	Continuing	Continuing in Action 20.1 (participate in relevant collaborative environmental program(s) for regional water bodies (i.e., Fraser River, Burrard Inlet, Strait of Georgia) along with First Nations, senior government, and interested parties).
3.5.4 Biennially produce a progress report on plan implementation for distribution to the Ministry of the Environment that:	Removed	Removed. Biennial reporting will be replaced by a short LWMP Annual Report, dashboards, and progress meetings. Refer to reporting commitments described in 'Monitoring and Reporting' Section of this LWMP.
3.5.4 (a) summarizes progress from the previous two years on plan implementation for all Metro Vancouver actions, including the status of performance measures	Removed	Removed. Biennial reporting will be replaced by a short LWMP Annual Report, dashboards, and progress meetings. Refer to reporting commitments described in 'Monitoring and Reporting' Section of this LWMP.
3.5.4 (b) includes summaries and budget estimates for proposed LWMP implementation programs for the subsequent two calendar years.	Removed	Removed. Replaced with reporting commitments described in 'Monitoring and Reporting' section of this LWMP.
3.5.5 Hold a public accountability session based on the biennial reports (Actions 3.5.4 and 3.5.8) by making the report available through Metro Vancouver's website and by holding a special meeting of the Metro Vancouver Waste Management Committee to receive public comments and input on the report.	Removed	Removed. Biennial reporting will be replaced by a short LWMP Annual Report, dashboards, and progress meetings. Refer to reporting commitments described in 'Monitoring and Reporting' section of this LWMP.
3.5.6 Report directly to the Ministry of Environment annual progress on integrated stormwater management plan implementation and all occurrences of sanitary sewer overflows.	Continuing	Continuing in Action 7.2 (inform the Province, regional health authorities, and the First Nations Health Authority of any sanitary sewer overflows as soon as they occur); Action 7.3 (report annually on the number and location of sanitary sewer overflows, and, where feasible, the estimated volumes and probable causes); Action 10.1 (use the Stormwater Monitoring and Adaptive Management Framework to monitor watershed health). Refer to reporting commitments described in 'Monitoring and Reporting' section of this LWMP.
3.5.7 In collaboration with members and the Ministry of Environment, undertake a comprehensive review and update of the plan on an eight year cycle.	Removed	Removed. This action is superseded due to a provision from the Ministry of Environment and Climate Change Strategy to make mid-plan amendments during the approximately 10-year cycle of the LWMP, should any changes be required.
3.5.8 Biennially, through Metro Vancouver, produce a progress report on plan implementation for distribution to the Ministry of the Environment that:	Removed	Removed. Biennial reporting will be replaced by a short LWMP Annual Report, dashboards, and progress meetings. Refer to reporting commitments described in 'Monitoring and Reporting' section of this LWMP.
3.5.8 (a) summarizes progress from the previous two years on plan implementation for all municipal actions, including the status of performance measures.	Removed	Removed. Biennial reporting will be replaced by a short LWMP Annual Report, dashboards, and progress meetings. Refer to reporting commitments described in 'Monitoring and Reporting' section of this LWMP.
3.5.8 (b) includes summaries and budget estimates for proposed LWMP implementation programs for the subsequent two calendar years.	Removed	Removed. Replaced with reporting commitments described in 'Monitoring and Reporting' section of this LWMP.
3.5.9 Report through Metro Vancouver to the Ministry of Environment annual progress on integrated stormwater management plan implementation and all occurrences of sanitary sewer overflows.	Continuing	Continuing in Action 7.2 (inform the Province, regional health authorities, and the First Nations Health Authority of any sanitary sewer overflows as soon as they occur); Action 7.3 (Members will report annually on the number and location of sanitary sewer overflows, and, where feasible, the estimated volumes and probable causes); Action 10.1 (use the Stormwater Monitoring and Adaptive Management Framework to monitor watershed health). Refer to reporting commitments described in 'Monitoring and Reporting' section of this LWMP.

3.5.10 Work with Metro Vancouver to give effect to 3.5.2, 3.5.5 and 3.5.7.	Removed Continuing	The Integrated Utility Management Advisory Committee no longer exists so reference to this committee is removed. Reporting actions removed (3.5.5 and 3.5.7). Biennial reporting will be replaced by a short LWMP Annual Report, dashboards, and progress meetings. Refer to reporting commitments described in 'Monitoring and Reporting' Section of this LWMP. 2011 LWMP Action 3.5.2 is continuing in Action 12.1 (coordinate a revision of the interagency group's terms of reference, to possibly operate as a sub-committee under the Regional Engineer's Advisory Committee (REAC), to lead local research on rainwater management, to be the primary regional advocate with regulators, to promote education and outreach on rainwater management, and to coordinate region-wide accountability on IWMP actions. Metro Vancouver and members will actively participate in the revitalized interagency group); and Action 19.1 (continue to receive advice from the Environmental Monitoring Committee).

Appendix E – Status of Past Actions from 2002 LWMP

Actions - Ministerial Conditions (MCs)	Status	Rationale
MC 1 Provide an opportunity for the public to have meaningful input into the implementation of the LWMP. Within two months of the publication of the biennial report referred to on page 55 of the LWMP, the district will notify the public of the existence of the report and receive comments and submissions at a special meeting of the district's Sewerage and Drainage Committee. The district will forward the minutes of this meeting, and copies of any submissions made, to Douglas Pope, Regional Environmental Protection Manager (the manager).	Completed Removed	Completed as reported in 2010 biennial report (a special meeting was held on March 11, 2009 to receive public input on the September 2008 Biennial Report, minutes from which were forwarded to the Ministry). Removed as an action, superseded by more recent direction from the Province regarding engagement and public involvement, and replaced with reporting commitments described in 'Monitoring and Reporting' section of this LWMP.
MC 2 Develop the environmental "triggers" used in the monitoring process by January 31, 2004, recognizing that the environmental monitoring process in the LWMP is based on discharge indicator trend analysis such that action will be implemented before Water Quality Objectives or other criteria are met or exceeded. The monitoring program shall include sediment quality, bioaccumulation of contaminants in marine life forms and structure of biological community, in addition to water quality parameters;	Completed Removed	Completed as reported in 2010 biennial report (Metro Vancouver submitted the “Cautions, Warnings, and Triggers Process” to the Ministry of Environment. A version of the triggers process similar to Metro Vancouver’s environmental triggers concept was also adopted by the CCME CWS-MMWE (Canada Wide Strategy for the Management of Municipal Wastewater Effluent) through its Risk Management Strategy in 2009). Removed as an action, superseded by the CCME CWS-MMWE and the development of Effluent Discharge Objectives (EDOs).
MC 3 Establish a linkage between biosolids quality and the effectiveness of source control programs;	Completed	Completed as reported in 2008 biennial report (Metro Vancouver has worked to eliminate batch discharge of materials at point sources which can cause rapid metal concentrations in liquid waste discharges. Increasing awareness of downstream impacts with industrial and commercial dischargers through visible sewer monitoring and targeted education programs have successfully prevented metals spikes that were more frequent before implementation of these programs).
MC 4 Eliminate chronic sanitary sewer overflows at Cloverdale and Maillardville by January 31, 2005 and eliminate all sanitary sewer overflows in the district that occur during storm or snowmelt events with less than a 5-year return period, by January 31 , 2012;	Removed Continuing	Removed. With aging infrastructure and more frequent extreme weather events, the locations of chronic sanitary sewer overflows are changing over time so these may be outdated. Continuing in Action 7.5 (continue to develop and implement municipal-regional sanitary overflow management plans to eliminate overflows at chronic locations).
MC 5 a) Modify C8 contained in the Policy and Commitment Document relating to upgrading schedule and toxicity as follows: a) Commitment C8 of Addendum No. 1 shall include a requirement that the district will upgrade Iona Island and Lions Gate sewage treatment plants to full secondary treatment no later than 2020 and 2030, respectively;	Removed	Removed and replaced with Wastewater Treatment Plant Upgrade and Expansion Schedule in this LWMP that will show the planned timing and treatment levels for wastewater treatment plants. Refer to Appendix A for this table.

MC 5 b) Modify C11 contained in the Policy and Commitment Document relating to upgrading schedule and toxicity as follows: Third paragraph of Commitment C11 shall be revised to read, '' ... The district will determine whether the cause of failed bioassay toxicity tests on effluent from Lions Gate and Iona Island treatment plants is only due to ammonia. The district shall, in consultation with the Environmental Monitoring Committee, evaluate options to address non-ammonia-related toxicity, and prepare and submit to the manager within 90 days an action plan to significantly reduce non-ammonia-related acute toxicity at the point of discharge. The action plan shall include a repetitive process for continuous improvements both upstream and to treatment if acute toxicity has not been significantly reduced once the original action plan is implemented."	Completed	Completed as reported in 2010 biennial report (In 2008 and 2009, all unsuccessful bioassay tests at Annacis and Lulu Island, Lions Gate, and Northwest Langley wastewater treatment plants were shown to be due to ammonia/pH shift. At the Iona Island Wastewater Treatment Plant, high oxygen demand and resulting low oxygen concentrations was the cause of all unsuccessful bioassay test results. Methods to prevent toxicity were implemented).
MC 6 Complete, by January 31 , 2007, each of the following: a) cost/benefit studies directed at implementing effective water conservation measures, including evaluating implementation of a universal water metering system throughout the district;	Completed	Completed as reported in the 2008 biennial report (economic analysis concluded that certain demand management measures were cost effective and sustainable and these were included as actions in the 2005 *Drinking Water Management Plan*).
MC 6 Complete, by January 31 , 2007, each of the following: b) reclaimed water projects at the treatment plants and elsewhere within the district; and	Completed	Completed as reported in the 2008 biennial report (construction of the Annacis effluent reclamation plant was completed in 2005 to demonstrate that water, suitable for a variety of applications, can be reclaimed from wastewater effluent thereby reducing the overall demand for high quality potable water).
MC 6 Complete, by January 31 , 2007, each of the following: c) a biosolids management plan.	Completed	Completed as reported in the 2010 biennial report (Key strategies for biosolids management contained in the Biosolids Management Plan Framework, submitted to the Ministry in late 2006, have been incorporated into the update of the LWMP).
MC 7 By January 31, 2003, establish a program to study endocrine disrupting chemicals (EDCs), persistent organic pollutants (POPs) and other microcontaminants such as pharmaceutical drugs found in regional (the district) liquid waste, and their potential environmental impacts. This should include, but not be limited to, effluent characterization to identify and quantify the contaminants and biological assays using new techniques such as gene chip arrays to determine their sublethal impacts. It would be coupled with determining the environmental fate of priority contaminants and be carried out in consultation with the district LWMP Environmental Monitoring Committee. The district will work with the Capital Regional District on such studies if the Capital Regional District undertakes similar work.	Completed	Completed as reported in the 2010 biennial report (As part of Metro Vancouver's comprehensive program to characterize the effluent from its five wastewater treatment plants, Metro Vancouver collaborates with Simon Fraser University, the University of British Columbia, and Environment Canada on studying micro-contaminants in treated wastewater).
Actions - Commitments (C)	**Status**	**Rationale**
Receiving Environment		
C1. Official Designation for Water Uses The District and municipalities will take an active role in providing information to the Ministry of Environment, Lands and Parks (MELP) so that appropriate water uses receive official designation from MELP through a consultative process for each of the major water bodies within the region. A review of a designated water use may be initiated by the District or a member municipality. The consultative process will follow Track 1 – Setting Guidelines from Principles as documented in the Ministry of Environment, Lands and Parks Guidelines and Standards Procedure, dated October 7, 1997. The process as outlined in Track 1 requires the preparation of a draft report by the Ministry. The following process will apply to local government participation during the preparation of the draft report to be prepared by the Ministry under the Guidelines and Standards Procedure:	Continuing	Continuing in Action 20.2 (continue to participate, and members may participate, in provincial processes to review and establish water uses and water quality objectives for specific water bodies within Metro Vancouver).

1. The Ministry will advise the District and its member municipalities, in writing, when a water use or water quality objective initiative is commenced. 2. The Ministry will develop the scope of work for their draft report in consultation with the Environmental Monitoring Committee. The Ministry will review the draft report work progress with the Environmental Monitoring Committee on a regular basis. The Environmental Monitoring Committee will play an active role in the development of the report and cost implications to the District and member municipalities will be provided for inclusion in the report. 3. The cost and benefit of designated water uses, or proposed changes to designated water uses, and their associated water quality objectives will be fully documented in the draft report and the GVRD Board and municipal councils will have the opportunity to review and comment on the draft report.		
C2. Establishment of an Environmental Monitoring Committee The District will establish an Environmental Monitoring Committee comprised of members from the District, municipalities, B.C. Ministry of Environment, Lands, and Parks, Environment Canada, Fisheries and Oceans Canada, research institutions, and public (dependent on interest). The committee will be responsible for reviewing the scope and design of monitoring programs, review of monitoring results, predictive modelling, and risk assessments of waste discharges. The committee's recommendations with respect to upgraded service levels will be considered by the District and member municipalities during an options assessment process.	Continuing	Continuing in Action 19.1 (continue to receive advice from the Environmental Monitoring Committee. The Committee will continue to be responsible for reviewing the scope and design of monitoring programs, review of monitoring results, predictive modelling, and risk assessments of waste discharges).
C3. Development Of Discharge Indicators The District will continue to develop and refine indicators of environmental effects related to wastewater discharges and stormwater runoff within the region. These indicators will be used to guide the collection and interpretation of environmental information by the District and municipalities. The District report, "Discharge Rating Measures for LWMP Discharges," included in Appendix C, will form an initial basis for this work.	Removed	Superseded by several LWMP actions that monitor or assess receiving environments. For examples, see actions in Strategy 7 Minimize impacts of sanitary sewer overflows on human health and environment; Strategy 8 Assess combined sewer overflows' impact on receiving environment; Strategy 10 Manage rainwater and urban development for watershed health; Strategy 19 Environmental monitoring to protect public health and the environment.
C4. Monitoring Programs The District and member municipalities will undertake monitoring, assessment and forecasting to evaluate the effects of wastewater and stormwater discharges to receiving environments - Effluent quality monitoring at all treatment plants for selected physico-chemical and biological characteristics (e.g., BOD, TSS, ammonia, and trace metals as well as appropriate bioassays and fecal coliform). Detailed effluent characterization of trace organic contaminants will be conducted periodically at the recommendation of the Environmental Monitoring Committee. - Routine monitoring of bacteriological water quality of beach areas within Burrard Inlet, Sturgeon Banks, Roberts Bank, and Boundary Bay. Sampling sites and frequency will be modified to provide a better understanding of point and non-point contaminant sources. - Ambient receiving environment monitoring in areas where water quality (as indicated by water quality objective criteria) is potentially affected by wastewater and/or stormwater. The Iona Island deep-sea outfall receiving environment program will be maintained. The need for, and details associated with, additional programs will be determined in consultation with the Environmental Monitoring Committee. - Occurrence and duration monitoring of CSO events at all District owned outfalls. Detailed effluent characterization of trace contaminants at a limited number of outfalls will be conducted periodically at the	Continuing	Continuing in Action 7.4 (conduct risk assessments at any new significant regional sanitary sewer overflow locations and will holistically compare the risk assessments of all sanitary sewer overflow locations to determine their relative risk, considering risks to public health and the environment); Action 8.5 (continue to assess change in receiving environment water quality resulting from any measures taken to address combined sewer overflow discharges. Metro Vancouver will report out, as applicable, in the *Environmental Management and Quality Control Annual Report*); Action 10.1 (use the Stormwater Monitoring and Adaptive Management Framework (AMF) to monitor watershed health); Action 13.2 (continue to monitor the quantity and characteristics of Metro Vancouver's wastewater treatment plant effluent discharges and assess effluent quality in accordance with the CWS-MMWE), Action 13.3 (continue to monitor influent and the receiving environment where wastewater treatment plants discharge and assess results to determine whether any actions, such as additional source control or treatment upgrades, are required); Action 19.2 (continue to monitor recreational water quality (seasonal beach monitoring) throughout the region , will continue to share this information with municipal beach operators and local Health Authorities, and will share this information with the First Nations Health Authority)

recommendation of the Environmental Monitoring Committee. - Monitoring and assessment of sensitive receiving environments following the discharge of SSOs.		
C5. Risk Assessment for Fraser River Irrigation Water Use The District will undertake an analysis of risks associated with the use of Fraser River water for agricultural irrigation within the GVRD area. Options for managing the defined risks will be developed and assessed.	Completed	Completed as reported in 2010 Biennial Report (study titled *Preliminary Risk Assessment for Use of Fraser River Water for Irrigation in the Greater Vancouver Regional District, December 2002*).
C6. Harmonization with Federal Legislation The District will work with the Federal Government to harmonize approaches regarding municipal discharges. The District will assist in the development of a national municipal effluent strategy, which is being led by Environment Canada.	Completed	Completed as reported in 2010 Biennial Report (Metro Vancouver has worked with senior governments and contributed to the development of a Canada-wide strategy for the management of municipal wastewater effluent. The strategy was developed by the Canadian Council of Ministers of the Environment (CCME), and endorsed by the CCME on February 17, 2009).
C7. Data Sharing and Communication The District will share environmental information and knowledge with member municipalities, other agencies, and the public in an open and timely fashion. Moreover, the District will proactively seek out venues, technologies, and media through which to efficiently communicate environmental information to the public.	Completed Removed Continuing	Completed as reported in 2010 Biennial Report (Metro Vancouver posts monthly data on effluent quality from the wastewater treatment plants on its website and provides annual reports on the monitoring programs for wastewater, biosolids and receiving water quality on the following website: https://metrovancouver.org/services/liquid-waste/reports-and-resources). Data from the Recreational (beach) Water Monitoring Program is shared with Vancouver Coastal Health, Fraser Health, (and municipalities, if requested) on an ongoing basis and the data is used by the public health authorities to help determine the suitability of beaches for primary contact recreation. All final reports for environmental monitoring work are placed in Metro Vancouver's Harry Lash Library for public access). Removed as an action in this LWMP. Continuing as described in the 'Monitoring and Reporting' section of this LWMP. LWMP Annual Report, dashboards, and the *Environmental Management and Quality Control Annual Report* will be posted publicly on Metro Vancouver's website.
Treatment Plants		
C8. Upgrading of Iona Island and Lions Gate Treatment Plants The District will upgrade the Iona Island and Lions Gate treatment plants by adding facilities for chemical addition (enhanced primary treatment) if necessary to maintain the established base level of treatment as defined by Policy P4. The District will construct facilities for biological treatment in the following circumstances: − if necessary to address environmental concerns in accordance with Policy P2. − to maintain effluent concentration and loading levels which are beyond the capability of enhanced primary treatment.	Completed Removed	Completed as reported in the 2010 biennial report (project definition reports and conceptual designs for new wastewater treatment plants were initiated). Removed and replaced with Wastewater Treatment Plant Upgrade and Expansion Schedule in this LWMP that shows the planned timing and treatment levels for wastewater treatment plants. Refer to Appendix A for this table.

C9. Treatment Plant Upgrading Projections The District will monitor plant influent and effluent to determine plant performance and trends and maintain a minimum 10-year future projection to determine the adequacy of plant process components and to establish process component design capacities for Operating Certificates .	Continuing	Continuing in Action 13.1 (plan, design, operate and maintain wastewater treatment infrastructure using the CWS-MMWE Environmental Risk Management Framework to address and adapt to identified risks and long term needs); Action 13.3 (continue to monitor influent and the receiving environment where wastewater treatment plants discharge and assess results to determine whether any actions, such as additional source control or treatment upgrades, are required).
C10. Secondary Effluent Disinfection The District will undertake engineering investigations examining the potential for effluent disinfection using ultraviolet light as an alternative to the use of chlorine at its Northwest Langley, Annacis Island, and Lulu Island wastewater treatment plants.	Completed	Completed as reported in 2010 Biennial report.
C11. Treatment Plant Effluent Toxicity Assessment For treatment plant effluent the District will undertake toxicity assessments to determine the probable cause of effluent toxicity and its significance relative to the receiving environment as described by Policy P2. The District will conduct monthly 96-hour acute bioassays on full strength effluent at each of the five wastewater treatment plants and review the results with the Environmental Monitoring Committee. The District will examine the results of the bioassay tests at Lions Gate and Iona Island treatment plants to determine the cause of effluent toxicity. Within the limitations of the existing liquid waste management treatment process and infrastructure, the District will evaluate options for improving the results of the bioassay tests. The selection of any option by the District will be made in consultation with the Environmental Monitoring Committee.	Completed Continuing	Completed as reported in the 2010 Biennial report (toxicity assessments at all five wastewater treatment plants in 2008 and 2009). Continuing in Action 13.2 (continue to monitor the quantity and characteristics of Metro Vancouver's wastewater treatment plant effluent discharges and assess effluent quality in accordance with the CWS-MMWE); Action 13.3 (continue to monitor the receiving environment where wastewater treatment plants discharge and assess results to determine whether any actions, such as additional source control or treatment upgrades, are required).
Combined Sewer Systems		
C12. CSO Monitoring The District will install monitors at all 14 CSO outfall sites under its jurisdiction to determine depth and duration of combined sewer overflows and an estimate of volume.	Completed Continuing	Completed as reported in the 2010 Biennial report (For the period of 2008 to 2009, Metro Vancouver continued to monitor combined sewer overflow events at all 18 outfall sites under its jurisdiction. Refer to Appendix B – Combined Sewer Overflow Reporting in the 2010 Biennial report). Continuing in Action 8.9 (Metro Vancouver and members with combined systems will maintain monitors at combined sewer overflow sites).
C13. Operational Improvements Requires the implementation of specific projects for operational improvements at combined sewer outfall locations. In respect to the Clark Drive Outfall, the District and municipalities will implement the following projects: • Vernon Relief Drain CSO storage; • Copley / Collingwood sanitary sewer extension to 8th Avenue Interceptor • Redirection of Columbia Pump Station discharges to downstream of Yukon Gate; • City of Vancouver Thornton pump station and forcemain realignment (completed in 2000) • City of Vancouver Hastings Park lost-stream daylighting (part of combined sewer separation – Commitment C15)	Completed Continuing	Completed as reported in 2010 Biennial report (description of site-specific upgrades within Vancouver Sewerage Area, Poplar Landing combined sewer overflow storage tank, Columbia Pump Station; Source Control actions on mercury and silver) Continuing in Action 8.8 (continue to develop and implement system optimization projects in the near term to minimize combined sewer overflow sanitary sewage loading and minimize total combined sewer overflow volume spilled).

C13. Operational Improvements (cont'd) • Combined sewer separation programs (Commitment C15) In addition, the District will, in consultation with stakeholders, investigate further site-specific CSO management options at the Clark Drive Outfall location. The District will also investigate further operational improvements for the Clark Drive catchment. The District will complete feasibility studies and detailed cost-benefit analysis for the following projects that offer potential operational benefits, overflow frequency or loading reductions, or receiving environment improvements: • Glenbrook Trunk Sewer separation; • New Westminster Interceptor West Branch sewer separation; • English Bay Outfall and Alma-Discovery Outfall storage and disconnection of storm inflow to Alma-Discovery outfall; • Jervis and Chilco Pump Stations forcemain and control improvements; • Operational Improvements – Fraser River North Arm; • Operational Improvements – New Westminster Area; • Operational Improvements – Westridge Area; and • Source control initiatives targeting mercury and silver reductions. Based on environmental data, which indicates that there are measurable near-field impacts at the Clark Drive outfall into Burrard Inlet, the District will undertake further environmental assessments at Clark Drive to assess the benefits of the improvements. This work will be conducted under the supervision of the Environmental Monitoring Committee (see Commitment C2). The municipalities of Vancouver and Burnaby and the District will also undertake a review of combined sewer separation and system upgrade schedules necessary to fast-track the elimination of Clark Drive CSOs earlier than 2050. In addition to the ongoing monitoring program at the Glenbrook Outfall, the District and the City of New Westminster will undertake assessment of all other CSOs on the New Westminster waterfront for quality and environmental impact on a five-year frequency, commencing in 2001, and thereafter as part of the five-year plan review process, in order to evaluate program progress and effectiveness and determine the need for further action by New Westminster in accordance with Policy P2.		
C14. Biennial Liquid Waste Management Plan Progress Report The District will summarize the CSO monitoring results, CSO environmental monitoring and assessment results, sewerage and drainage expenditures for CSO projects, and results of CSO operational improvement investigations and implementation in a Liquid Waste Management Plan biennial progress report. The biennial reporting period will end on December 31st of every second calendar year and the report will be due by the end of March (90 days to compile). The first reporting period will end in the second whole year (not less than 24 months and not more than 36 months) following the year an LWMP is approved. An interim annual report will be submitted in March and will summarize the key achievements that occurred in the previous year.	Completed Removed Continuing	Completed as reported in 2010 Biennial report. Removed. Biennial reporting will be replaced by a short LWMP Annual Report, dashboards, and progress meetings. Refer to reporting commitments described in the 'Monitoring and Reporting' Section of this LWMP. Continuing in Action 8.2 (continue to estimate and report annually on the frequency, location and volume of sewage overflows from regional combined sewers, and where feasible identify and address the probable causes); Action 8.4 (continue to estimate and report annually on the frequency, location and volume of combined sewer overflows from municipal sewers, and where feasible identify and address the probable causes).

C15. Combined Sewer Overflow Elimination The cities of Vancouver, Burnaby, and New Westminster will implement combined sewer separation programs that will replace aging combined sewers with separate sanitary and storm sewers and lead to the elimination of combined sewer overflows. 1. The City of Vancouver will continue with the present combined sewer system separation program at approximately 1 per cent of the system per year to target elimination of combined sewer overflows in the Vancouver Sewerage Area by 2050. 2. The City of Burnaby will implement a combined sewer separation program that proceeds on an annual basis, at a uniform rate, and that targets elimination of combined sewer overflows in the Vancouver Sewerage Area by 2050 and in the Fraser Sewerage Area by 2075. 3. The City of New Westminster is committed to implementation of Combined Sewer Overflow (CSO) reduction measures which meet or exceed 1% per year, resulting in long-term CSO elimination by means of sewer separation as well as by other means (e.g., detention storage, source controls, etc.). The city will complete the installation of storm sewers within 22 per cent of the combined sewer area by 2012. This effort will focus on the lower Columbia catchment. Opportunistic sewer separation will also occur in other areas where capacity is an issue with existing combined sewers. The entire sewer system will be video inspected by 2012 and infiltration and inflow reduction achieved through sewer rehabilitation. In addition, source control projects (such as removal of rainwater roof leaders from direct connection to the sewer system) will be implemented, and the effectiveness of these methods will be evaluated. Overall, this program will produce CSO reductions at a rate in excess of 1% per year.	Continuing	Continuing in Action 9.2 (develop intermediate targets on a five-year interval for municipal and regional separation of prioritized combined catchments); Action 9.3 (Burnaby, New Westminster, and Vancouver will continue to work with Metro Vancouver to develop and implement Sewer Separation and Combined Sewer Overflow Elimination Plans to prevent combined sewer overflows, and in the interim, support the intermediate targets developed in action 9.2; Burnaby, New Westminster, and Vancouver will separate municipal collector sewers according to the Sewer Separation Plans).
C16. Operational Improvement Investigations Municipalities will complete feasibility studies and detailed cost benefit analysis for the following projects that offer potential operational benefits, overflow frequency or loading reductions, or receiving environment improvements: • Cambie Pump station and outfall improvements (Vancouver); • 1st and Boundary pump station realignment (Vancouver and Burnaby); and • Stormwater redirection to Grandview Cut (Vancouver).	Completed Continuing	Completed as reported in 2010 Biennial report (Studies are being undertaken to look at ways to achieve early combined sewer overflow reductions cost-effectively. These studies are ongoing in conjunction with the main line sewer separation program and private property separation program). Continuing in Action 8.8 (continue to develop and implement system optimization projects in the near term to minimize combined sewer overflow sanitary sewage loading and minimize total combined sewer overflow volume spilled, while also considering effects on sanitary sewage loading from sanitary sewer overflows).
C17. Best Management Practices The Cities of Vancouver, Burnaby, and New Westminster will continue with best management practices such as catch basin cleaning that reduce loads to combined sewers at source and rain barrel, impervious area reduction, or on-site storage that reduces peak flows or volumes of stormwater runoff to sewers.	Completed Continuing	Completed to varying extents by different municipalities with combined sewer systems as reported in 2008 Biennial report, Appendix 2. Continuing in Action 10.2 (continue to develop, review and update Integrated Watershed Management Plans (IWMPs)); and Action 10.5 (expand the use of green infrastructure, blue infrastructure, and other practices to mimic natural watersheds, reduce runoff and discharge, improve water quality and increase climate resilience. Members with combined sewers will expand the use of green infrastructure to complement combined sewer separation).

C18. Biennial Liquid Waste Management Plan Progress Report Every two years municipalities with combined sewers will summarize and forward to the District for inclusion in a biennial Liquid Waste Management Plan progress report the following information: • Sewer system mapping that indicates the overall extent of combined, sanitary, and storm sewers, the extent of combined sewers replaced by separate sewers in the past two years, the location of new storm outfalls, and the extent of private property combined service connections replaced by separate service connections. • A summary of sewerage and drainage system expenditures for the past two years. The biennial reporting period will end on December 31 of every second calendar year and the report will be due by the end of March (90 days to compile). The first reporting period will end in the second whole year (not less than 24 months and not more than 36 months) following the year an LWMP is approved. An interim annual report will be submitted in March and will summarize the key achievements that occurred in the previous year.	Removed	Removed. Biennial reporting will be replaced by a short LWMP Annual Report, dashboards, and progress meetings. Refer to reporting commitments described in 'Monitoring and Reporting' Section of this LWMP.
Separate Sanitary Sewer Systems		
C19. Infrastructure Management The District and its member municipalities will establish ongoing sanitary sewer system evaluation programs to determine the condition of the regional trunk sewerage system, the municipal sewerage system, and private property service laterals. As required, legislative and legal authority will be sought to address infiltration and inflow originating from private property service laterals. These evaluation programs will be ongoing and determine the condition of the entire sewer system over a 20-year time cycle. The District and its member municipalities will develop and apply a consistent approach to sewer system evaluation surveys. Repair and replacement programs will be established based on targets set for sanitary sewer overflow reduction and the severity of infiltration and inflow relative to the design allowance of 11,200 litres per hectare per day.	Completed Continuing	Completed to varying extents by member jurisdictions as reported in 2010 Biennial report. Completed via Metro Vancouver report "Private Sewer Lateral Programs: A Study of Approaches and Legal Authority for Metro Vancouver Municipalities." Continuing in Action 1.1 (maintain the condition and performance of the sewerage system to serve a growing population in a changing climate); Action 1.2 (provide local collector and regional trunk sanitary sewer capacity; and wastewater treatment plant hydraulic capacity for peak dry weather flow plus an inflow and infiltration allowance of 11,200 L/ha/d, to ensure hydraulic gradelines stay within safe operating levels)
C20. New Construction Objectives The District and its member municipalities will review engineering standards and guidelines for new sewer construction with the objective of ensuring a high standard for new construction to minimize future infiltration and inflow problems.	Completed Continuing	Completed as reported in the 2010 Biennial report (Master Municipal Construction Document design standards were modified to reduce inflow and infiltration). Continuing in Action 11.4 (coordinate, with members, an approach for seeking to update the Master Municipal Construction Documents such that green infrastructure guidelines become standards)
C21. Wet Weather Facilities The District will complete the conceptual designs and feasibility studies for the following wet weather facilities to reduce chronic sanitary sewer overflows: Cloverdale storage and operational improvements; and Maillardville sanitary sewer increased conveyance (growth pre-build).	Completed	Completed as reported in the 2010 Biennial report (The Cloverdale storage facility construction is complete).
C22. Flow Monitoring The District will maintain a network of flow monitors that will continually monitor sewer flows and will determine the daily average flow by specific catchments, or by municipality where the flow monitoring configuration is appropriate.	Completed	Completed as reported in the 2010 Biennial report (Metro Vancouver maintains an extensive sewer flow monitoring network for billing purposes and to assist in determining when capacity upgrades are needed. In addition, Metro Vancouver has upgraded its SCADA computer system and its data storage database).

C23. Biennial Liquid Waste Management Plan Progress Report Every two years, municipalities will summarize and forward to the District for inclusion in a biennial Liquid Waste Management Plan progress report, the following information: • Sewer system mapping that indicates the overall extent of the current cycle of the sanitary sewer system evaluation program and the condition of sewerage infrastructure. • The extent of new sewer construction and sewer repair and replacement work over the past two years. • A summary of the results of all flow monitoring work undertaken as part of the sewer system evaluation program. • The location and frequency of sanitary sewer overflows occurring from the municipal collection system. • A summary of sewerage system expenditures for sewer system evaluation work, and repair and replacement work. The biennial reporting period will end on December 31st of every second calendar year and the report will be due by the end of March (90 days to compile). The first reporting period will end in the second whole year (not less than 24 months and not more than 36 months) following the year an LWMP is approved. An interim annual report will be submitted in March and will summarize the key achievements that occurred in the previous year.	Completed Removed Continuing	Completed as reported in the 2010 Biennial report by different member jurisdictions. Removed. Biennial reporting will be replaced by a short LWMP Annual Report, dashboards, and progress meetings. Refer to reporting commitments described in 'Monitoring and Reporting' Section of this LWMP. Continuing in Action 6.1 (members will complete inflow and infiltration management plans); Action 6.2 (members will use the inflow and infiltration dashboard to track progress in reducing inflow and infiltration); Action 7.3 (Metro Vancouver and members will report annually on the number and location of sanitary sewer overflows, and, where feasible, the estimated volumes and probable causes).
Source Control and Demand Management		
C24. Reduction of Copper The District will recommend that the Greater Vancouver Water District (GVWD) consider the benefit of copper reduction in wastewater effluent and biosolids and meet the current implementation schedule for construction of facilities for pH adjustment of drinking water.	Completed	Completed as reported in the 2010 Biennial report (adjustments to pH are completed at Seymour and Coquitlam drinking water sources to reduce copper in potable water which also reduces copper in wastewater and biosolids).
C25. Sewer Use Bylaw Review The District will update the *Regional Sewer Use Bylaw* to reflect the most recent scientific and technical knowledge about the impact of substances discharged to sewer on human health and safety, performance of collection and treatment systems, and the receiving environment.	Completed Continuing	Completed as reported in the 2010 Biennial report (new Codes of Practice for Dry Cleaners and Photographic Imaging Operations). Continuing in Actions 3.3 (pursue reductions in industrial wastewater flow and loading, starting with updating fees in bylaws to create financial incentives that motivate industries to minimize their wastewater discharges); Action 4.1 (update Metro Vancouver's bylaws for industrial and commercial dischargers).
C26. Development of Peak Discharge Limits and Fees for Industry The District will develop, in co-operation with identified stakeholders, a system of limits and fees to be implemented across the District. Maximum daily loadings (limits) will be assigned to industrial operations that are discharging more than an established percentage of the annual loadings received by the wastewater treatment plant servicing the particular industry. Limits will be accompanied by a system of fees that will include additional charges for the difference between the average and maximum daily loadings and charges based on marginal costs for treating the loadings exceeding the assigned (authorized) maximum daily loadings.	Completed	Completed as reported in the 2010 Biennial report (new limits and fees for industrial dischargers in sewer use bylaw).
C27. Criteria for New Industrial Demand for More than 3% of Capacity The District will develop criteria to be used in development of a business case if a single industrial user proposes to exceed more than 3% of the system capacity.	Completed	Completed as reported in the 2008 Biennial report (new sustainability-based business case framework with new set of metrics).

C28. Reduction of Demand for Treatment Capacity The District will investigate initiatives that have the potential to reduce the per capita demand for treatment from the 1998 levels. Demand management for all sewer user sectors (residential, industrial, and commercial/institutional) will be examined and considered through business case development.	Completed Continuing	Completed as reported in the 2010 biennial report (via actions reported in C25 and C26). Continuing in Strategy 3 (Reduce flows and loadings into the system) and Strategy 5 (Reduce excess rainwater entering into private lateral sewers).
C29. Education Program The District will develop and implement an educational program for the residential, commercial, and institutional use targeting specific practices that have pollution prevention or demand management benefits. An education program on the use of food grinders will be developed.	Completed Continuing	Completed as reported in 2008 and 2010 biennial reports (surfactant reduction program, Smartsteps and Buildsmart programs, industry resource document). Continuing in Action 3.1 (pursue reductions in residential wastewater flow and loading through improving education and awareness, starting with discouraging disposal of food waste down drains); Action 4.2 (continue to motivate residents and businesses to prevent pollution at the source by properly managing what they send down drains and toilets).
C30. Sewer Use Charges for Commercial and Institutional Sector The District will assist member municipalities in reviewing sewer charges for the commercial and institutional sector, given that user pay charges are instrumental in cutting demand for service.	Completed	Completed as reported in 2008 biennial report (in 2005, a methodology for estimating both Metro Vancouver and municipal costs of conveying and treating commercial and institutional discharges was developed for municipalities to use).
C31. Evaluation of Current Industrial Pricing Strategy The District will evaluate the efficiency of the current BOD/TSS Industrial Pricing Strategy in reducing demand for treatment capacity.	Completed	Completed as reported in 2008 biennial report (*Evaluation of the Effectiveness of the Industrial BOD/TSS Pricing Strategy for Reducing Demand from Industry in the GVRD,* Compass Resource Management Ltd, March 15, 2004).
C32. Recognition for Water Conservation The District, in conjunction with the Greater Vancouver Water District (GVWD), will evaluate implementation of a recognition program that acknowledges reductions in water usage and wastewater generation. The District will consider loading-based permit limits, in addition to the existing concentration-based permit limits, for operations that can demonstrate consistent reductions of more than 10% in their water consumption (expressed as volume of water per unit of production).	Removed Continuing	Removed. This specific action may be outdated and may not be effective in making significant reduction in water consumption. Continuing in Strategy 3 (Reduce flows and loadings into the system).
C33. Notification to Environment Canada If, through environmental monitoring and assessment, a substance is identified as a potential concern in the aquatic environment but is not listed in the Canadian Environmental Protection Act, the District will notify Environment Canada and request that they commence a substance review in accordance with current process for such reviews.	Completed Continuing	Completed as reported in the 2010 biennial report (notified Environment Canada that flame retardants containing PBDE should be banned). Continuing in Action 4.1 (prioritize contaminants for source control using the Canadian Council of Ministers of Environment (CCME) Canada-wide Strategy for Management of Municipal Wastewater Effluent (CWS-MMWE) Environmental Risk Management Framework. Metro Vancouver will take further source control actions such as educating target sectors to reduce discharges, advocating for increased provincial and federal regulations on the manufacturing and use of products with contaminants, and updating Metro Vancouver's bylaws for industrial and commercial dischargers).

Residuals Management		
C34. Iona Island Treatment Plant Biosolids At the Iona Island Wastewater Treatment Plant site, the District commits, as a minimum, to recycling or disposing of ongoing biosolids production once the land area and lagoons are full.	Completed Continuing	Biosolids produced at the Iona Island Wastewater Treatment Plant are now dewatered and beneficially used in land application. Continuing in Action 15.1 (grow the land application program).
C35. Biosolids Growing Medium The District commits to produce and distribute biosolids growing medium which meet standards set out in the Organic Matter Recycling Regulation Draft 2.0, dated July 1999. As currently drafted this regulation would allow distribution of Class A biosolids growing medium with no limit on quantity and without the need to obtain permits or approvals from the Ministry of Environment, Lands and Parks. Prior to the proposed regulation being passed the District will work with the Ministry of Environment, Lands and Parks to include the requirements for the distribution of biosolids in the operating certificates for the District's facilities.	Continuing	Continuing in Action 15.1 (grow the land application program). All biosolids used in land application (including Biosolids Growing Medium and Class A Compost from biosolids) meets or surpasses the requirements of the Organic Matter Recycling Regulation.
Stormwater Management		
C36. Interagency Liaison Group Stormwater management planning will build on the improved information on stormwater problems and solutions developed during the Liquid Waste Management Plan process. To facilitate the ongoing exchange of information on stormwater issues, and implementation of the Liquid Waste Management Plan, municipalities and the District will participate in an interagency liaison group similar to the existing Stormwater Management Task Group. The group will provide advice to the District about stormwater issues.	Continuing	Continuing in Action 12.1 (coordinate a revision of the interagency group's terms of reference, possibly to operate as a sub-committee under the Regional Engineer's Advisory Committee (REAC)).
C37. Stakeholder Participation The community, senior and local government agencies, and other stakeholders will be invited to participate in the integrated planning process intended to proactively address issues on a long-term basis.	Continuing	Continuing in Action 12.4 (host a forum at regular intervals to report progress on IWMPs and LWMP rainwater actions, and to foster collaboration and knowledge sharing among members, First Nations, and interested parties).
C38. Policies and Bylaws Municipalities, in consultation with the District where appropriate, and the Stormwater Interagency Liaison Group, commit to adopting or updating, policies or bylaws related to improving stormwater management for at least two stormwater issues over the five year period of the stormwater plan. Issues to be considered may include, source control, flood protection, sediment and erosion control, soil conservation and topsoil removal, impervious area, and protection of riparian areas.	Completed Continuing	Completed to varying extents by different municipalities as reported in 2010 biennial report, Appendix 2. Continuing in Action 11.2 (update rainwater policies, programs, and bylaws in a harmonized manner).
C39. Rate of Watershed-scale Stormwater Planning Work Municipalities commit to undertake (or review) integrated stormwater management planning at a watershed scale for urban watersheds (less than 80% of watershed area is in the Green Zone as defined in the 1996 Livable Region Strategic Plan). Watershed-scale planning will be ongoing and evolving and proceed such that plans for all watersheds will be completed within the first twelve years following approval of the LWMP. Each watershed plan will be reviewed at least once every twelve years. The Stormwater Interagency Liaison Group will develop a terms of reference template for integrated stormwater management planning to facilitate the implementation of watershed-scale stormwater management plans in the municipalities. The District will participate in watershed-scale stormwater management plans as appropriate and where watersheds include two or more municipalities, a coordinated approach will be undertaken by appropriate municipalities.	Completed Continuing	Completed to varying extents by different municipalities as reported in 2010 biennial report. Continuing in Action 10.1 (use the Stormwater Monitoring and Adaptive Management Framework (AMF) to monitor watershed health).

Pleasure Craft Sewage		
C40. Pump-Out Facility Inventory The District will complete an inventory of all available pump-out facilities in the region.	Completed	Completed as reported in 2006 biennial report (inventory of pump-out facilities in the region was completed).
C41. New Marinas and Major Renovations Municipalities will modify or adopt bylaws that require all new marinas, or marinas undergoing renovations that exceed 50 per cent of their assessed value, to install pump-out facilities for access by pleasure craft. As appropriate, these facilities should be connected to the municipal sewer system or designed for handling by trucked liquid waste.	Completed Continuing	Completed to varying extents by different municipalities as reported in the 2008 and 2010 biennial reports. Continuing in Action 20.3 (work with private marina operators, the Province and the federal government to develop and implement regulations to ensure all new marinas and marinas where planned renovations exceed 50 per cent of the assessed existing improvement value have pleasure craft pump-out facilities).
C42. Existing Marinas The District, in consultation with municipalities, marina operators, boaters, and senior government agencies, will undertake a feasibility study to determine how existing marinas can accommodate pump-out facilities, the cost to install such facilities, and how they would be financed, maintained, and operated.	Completed Continuing	Completed as reported in 2006 biennial report (feasibility study for pump-out facilities at existing marinas). Continuing in Action 20.4 (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)
On-site Sewage Disposal Systems		
C43. On-site Disposal Mapping The District and its member municipalities will complete an inventory map of areas containing on-site disposal systems on a watershed basis. The District and its member municipalities will also prepare mapping indicating projected on-site system densities to 2021.	Completed	Completed as reported in 2010 Biennial report (A map of the on-site disposal systems has been completed. The mapping is shown in Appendix 1).
C44. Performance to be Considered by Ministry of Health The Ministry of Health will be requested to consider the performance of existing systems, known pollution issues, and projected on-site system densities in the watershed when approving new systems.	Removed	Removed because onsite sewage disposal systems are regulated provincially.
C45. Performance to be Considered by Ministry of Environment, Lands and Parks. The Ministry of Environment, Lands and Parks will be requested to consider the performance of existing systems and the projected density of on-site systems when assessing nitrate contamination levels in groundwater aquifers.	Completed	Completed as reported in the September 2008 Biennial report (case studies of the impacts of on-site sewage systems on ground and surface waters were completed and were to be sent to the Province).
C46. Environmental Monitoring and Assessment The District will undertake environmental monitoring and assessments in the region's waterways to identify and determine if on-site disposal systems are contributing to waterway degradation.	Completed	Completed as reported in the September 2008 Biennial report (case study completed that developed mapping and monitoring methods and provided preliminary direction for determining limits to on-site system densities).

Agricultural Runoff		
C47. Compilation of Agricultural Watershed Water Quality Data The District will compile the monitoring information and findings from past scientific studies to determine the current base-line data associated with water quality in agricultural watersheds and in receiving waterways.	Completed Continuing	Completed as reported in Metro Vancouver 2008 Biennial report (completed in 2004, in 2005, Environment Canada collated information into a single electronic database this commitment in *Acquisition and Collation of Nutrients Data from Agricultural Areas of the Fraser Valley).* Continuing in Action 10.3 (ensure IWMPs integrate rainwater and groundwater management, consider agricultural land rainwater runoff, and reflect the provisions of the Province's *Watershed Security Strategy* once it is launched).
C48. Environmental Monitoring and Assessment The District will include waterways in agricultural areas and the associated receiving waterways in its comprehensive water quality monitoring and environmental assessment program. This work will be coordinated with the Nutrient Management Action Plan for the Lower Fraser Valley under the Fraser Basin Council.	Completed Continuing	Completed as reported in Metro Vancouver 2008 Biennial report (completed in 2004, in 2005, Environment Canada collated information into a single electronic database this commitment in *Acquisition and Collation of Nutrients Data from Agricultural Areas of the Fraser Valley).* Continuing in Action 10.3 (ensure IWMPs integrate rainwater and groundwater management, consider agricultural land rainwater runoff, and reflect the provisions of the Province's *Watershed Security Strategy* once it is launched).
C49. Identification of Water Uses and Water Quality Objectives Through their integrated stormwater management programs, municipalities will identify water uses and water quality objectives for waterways, or confirm the applicability of existing uses and objectives.	Continuing	Continuing in Action 20.2 (continue to participate, and members may participate, in provincial processes to review and establish water uses and water quality objectives for specific water bodies within Metro Vancouver).
Note: POLICIES (Ps) in the 2002 LWMP were not classified as actions. Hence, they were not reported in the biennial reports and do not have a status to include in this table. Appendix F lists the policies separately for reference.		

Appendix F – List of Policies from 2002 LWMP

The 2002 LWMP had Policies which were included in the plan, but were not reported in the Biennial or Interim reports. These Policies are included below for reference and new actions that align with specific policies have been noted as such under the action.

Receiving Environment

P1. Designated Water Uses will be Protected.

The District and member municipalities will manage wastewater and stormwater to protect receiving water uses which have been designated by the Ministry of Environment, Lands and Parks (MELP).

P2. Upgraded Service Levels will be Determined Based on Environmental Need, with Consideration to Cost and Benefit, Regional Priorities, and all Applicable Legislation.

Commitments included in this plan address infrastructure management needs and confirmed public health and environmental issues. Upgraded service levels will be provided in the future where an environmental need has been forecasted or demonstrated, with consideration to cost and benefit, regional priorities, and all applicable legislation. The following process and "triggering" mechanisms (Figure 3) will be used to determine environmental need.

Environmental monitoring conducted by the District and member municipalities will determine if, and where, wastewater or stormwater discharges are contributing to exceedances of water quality objectives. The Environmental Monitoring Committee (see Commitment C2 – Establishment of an Environmental Monitoring Committee) will assess the monitoring results and, where warranted, "trigger" an environmental risk assessment of the particular discharge(s). The assessment may involve more comprehensive receiving environment and laboratory analysis, modelling, and forecasting, to determine the degree of environmental risk. Options for managing the defined risks will be developed by the District and member municipalities and assessed according to cost and environmental benefit criteria. The Environmental Monitoring Committee will be responsible for guiding the assessment processes for both risk and the environmental benefits of options. When a "trigger" is identified the Environmental Monitoring Committee will suggest the time-line to complete the risk and options assessment processes.

When risks, options, costs and benefits have been adequately assessed the District Board, with consideration of costs and Greater Vancouver Regional District benefits, regional priorities, and all applicable legislation, will select the appropriate response and actions. In their consideration the Board will consult with the Ministry of Environment, Lands and Parks and Environment Canada.

Environmental monitoring will be conducted following implementation of any option to determine the need for additional risk mitigation measures.

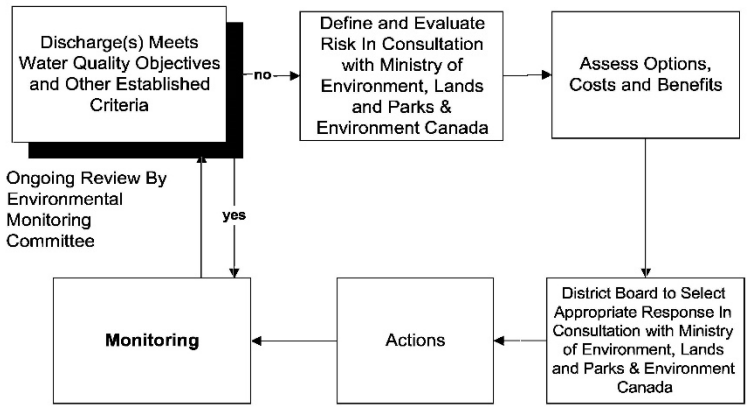


Figure 3 – Upgrading "trigger" mechanism

Treatment Plants

P3. Treatment Plant Operations and Maintenance

The District will operate and maintain the regional treatment plants to minimize risks to public health and the environment.

P4. Base Levels of Treatment at District Plants

The District will size plant process components on the basis of established historical flows and loads and projected future changes in accordance with good engineering practice and treatment plant design standards that are periodically approved by the District Board. Plant performance will be measured against authorised levels for flow, concentrations, and loads established in the operating certificates. Maximum daily (flow proportioned 24-hour composite sample) concentration levels are:

	BOD (mg/l)	TSS (mg/l)
Iona Island	130	100
Lions Gate	130	130
Annacis Island	45	45
Lulu Island	45	45
Northwest Langley	45	45

If these maximum daily concentration levels are exceeded on an operational basis then:

- the District will investigate the cause and an incident report to determine the significance and probable cause will be prepared.

- the District will evaluate the significance against its treatment plant design guideline to determine if plant expansion, upgrading, or additional source control initiatives are justified. The determination of environmental significance will be undertaken in consultation with the Environmental Monitoring Committee.

Annual effluent loads will not exceed the following maximum annual loading levels:

	BOD (t/year)	TSS (t/year)
Iona Island	72,600	55,850
Lions Gate	5,770	5,770
Annacis Island	no limit	no limit
Lulu Island	no limit	no limit
Northwest Langley	no limit	no limit

At the Annacis Island, Lulu Island, and Northwest Langley Wastewater Treatment Plants the District will provide secondary treatment for flows up to two times measured dry weather sanitary flow. Wet weather management plans to manage infiltration and inflow and stormwater will be developed for flows in excess of secondary treatment capacity.

At the Lions Gate Treatment Plant the District will provide primary treatment for flows up to two times measured dry weather sanitary flow. Wet weather management plans to manage infiltration and inflow and stormwater will be developed for flows in excess of primary treatment capacity.

For the Iona Island Treatment Plant the District will provide primary treatment for flows up to a maximum of 17 cubic metres per second. This plant capacity will be reviewed every 5 years based on flow determinations arising out of progress in the combined sewer separation programs.

P5. Upgrading from Base Levels of Treatment

The District will upgrade the level of treatment, or initiate source control measures, if the base level of treatment is not adequate to protect the aquatic environment as defined by Policy P2 and determined by the receiving water environmental objectives and performance measures.

Combined Sewer Systems

P6. Combined Sewer Overflows

No new combined sewers will be constructed in the GVRD geographic area. Existing combined sewers will be replaced by separate sanitary and storm sewers through infrastructure replacement and sewer capacity upgrading programs. Private combined sewer service connections will be replaced with separate sanitary and storm sewer

connections when a property is redeveloped or when substantive building or site renovations are undertaken.

The policy of the District is to eliminate all combined sewer overflows from its facilities. Priority will be given to reducing or eliminating those combined sewer overflows identified by the Environmental Monitoring Committee as having significant environmental impact.

P7. Combined Sewer Overflow Monitoring

Combined sewer overflow volumes will be monitored and trended at all outfalls under the District's jurisdiction to measure the effect and progress of combined sewer replacement programs. Environmental monitoring and assessment will determine risks and the need for any additional interim measures at combined sewer outfalls.

Separate Sanitary Sewer Systems

P8. Infrastructure Management

The District and its member municipalities will establish sewer system infrastructure management programs that will maintain the regional trunks and interceptors, the municipal collection system, and the private service laterals in a state of good repair. The objective will be to ensure the sustainability of the collection system so that expensive repair and rehabilitation is not deferred to future generations and that the average daily infiltration and inflow will not exceed 11,200 litres per hectare per day as a result of a storm with less than a five year return period.

P9. Basic Sanitary Sewer Service Capacity

The District will establish a basic level of service capacity for all District sanitary sewers that provides for the conveyance of measured dry weather flows plus a wet weather allowance for infiltration and inflow of 11,200 litres per hectare per day, such that the hydraulic grade lines do not exceed established safe operating levels.

P10. Sanitary Sewer Overflow Documentation And Targets

The District will document all sanitary sewer overflows from the collection system under its jurisdictions and determine the cause of overflow. The District and its member municipalities will establish targets for sanitary sewer overflow reduction as part of their sewer system infrastructure management programs to target reduction and long term elimination of wet weather sanitary sewer overflows caused by storms of less than a five year return period. Areas experiencing high growth and chronic sanitary sewer overflows with associated health or environmental risks will receive the highest priority for elimination of sanitary sewer overflows.

P11. Sanitary Sewer and Combined Sewer Interaction

In parts of the collection system where both sanitary and combined sewer overflows are occurring due to the interaction of these sewer systems, and operational improvements are being considered to minimize overflows, the objective will be to minimize the total volume of sanitary sewage (contained in combined and sanitary sewer overflows as a component together with stormwater) that is discharging to the receiving waterways.

P12. Consideration of Consequence

When addressing sanitary sewer overflow issues, the District and its member municipalities will prioritize efforts and consider emergency spill locations to mitigate the consequence of overflows in the following priority:

1. Discharges that compromise public health;
2. Discharges that compromise public and private property damage; and
3. Discharges that have confirmed near-field environmental impacts.

P13. Emergency Overflow Locations For Unavoidable Sanitary Sewer Overflows

The District and its member municipalities will maintain a system of emergency overflow locations and prepare emergency spill contingency plans to minimize the consequence of unavoidable sanitary sewer overflows caused by extreme wet weather, system failures, and unusual events.

Source Control and Demand Management

P14. Control of Toxic Substances Discharged to Sewer

The District's Source Control Program will be consistent with the Canadian Environmental Protection Act (CEPA) control options for toxic substances. This will be in addition to the list of prohibited and restricted substances included in the Regional Sewer Use Bylaw.

P15. Promotion of Pollution Prevention

Control of the quality and quantity of discharges to sewer by applying the principles of pollution prevention will be emphasized and promoted in all sewer permits, codes of practices, waste management practices and education programs that are issued, developed and implemented by the District.

P16. Best Available Technology

Where pollution prevention fails to eliminate contaminants from discharges, the District will recommend Best Available Technology, which is proven and economically feasible, to be applied to remove contaminants of concern prior to discharge to sewer.

P17. Control of Peak Daily Demand from Industry

The District will control the peak daily demand from industry through a system of flow and load limits and fees.

P18. Usage of Capacity by the Users of the Sewer System

Any trend or projected demand that would affect the historical proportions of usage of system capacity (conveyance and treatment) will be brought to the attention of the District Board and its impact considered. The policy of business casing any new industrial demand for more than 3% of the system capacity will be continued.

P19. Promotion of Water Conservation

The District will encourage water conservation initiatives by recognizing reductions in water usage and wastewater generation.

P20. Elimination of Stormwater Discharges into Sanitary Sewers

The District will not permit new stormwater sources to be connected to its sanitary sewer system and will continue its current policy of eliminating stormwater discharges currently authorized by Authorizations and Permits. Any exception to this policy will be evaluated and considered in consultation with the affected discharger, host municipality, and representatives of the senior level of governments in charge of environmental protection.

The District, in addition to not issuing new authorizations for discharges of stormwater into sanitary sewers, will continue the program of eliminating all stormwater contributions allowed under the existing industrial permits. Each industrial operation will be required to develop and implement a plan for removal of the stormwater components from their sanitary sewer discharge.

Residuals Management

P21. Cost Effectiveness and Recycling

The District will manage its residuals in a cost-effective, environmentally sound, and reliable manner.

The District will manage its biosolids based on the principle of recycling, but will continue to evaluate cost-effective, non-recycling options.

P22. Grit and Screenings Disposal

Grit and screenings will continue to be sent to disposal facilities (landfill or incineration), both within the GVRD solid waste system and, when necessary, to other facilities within B.C. or outside of the province.

P23. Recycling Program Cost Allocation

It is intended that the District's Biosolids Recycling Program will continue to be funded annually as a regional program. Direct costs (those directly attributable to recycling projects) will be allocated to the four sewerage areas at the end of each year based on the tonnes of biosolids recycled for each sewerage area in that year. Indirect costs will be allocated to the four sewerage areas at the end of each year based on the tonnes of biosolids produced by each sewerage area during that year.

Stormwater Management

P24. Five Year Time-Frame

The stormwater management policies and commitments will apply to all District municipalities, and as appropriate the District, for a period of five years after approval of the Liquid Waste Management Plan, at which time they will be reviewed and updated.

P25. Integrated Planning Approach

The member municipalities, in consultation with the District where appropriate, will undertake a proactive integrated planning approach to municipal stormwater management, in areas serviced by separated stormwater systems, thereby improving the efficiencies and effectiveness of regulatory approvals. This integrated planning approach will integrate watershed, catchment, master drainage plans, and stormwater plans into relevant municipal planning processes such as Official Community or Neighbourhood Concept plans, Recreation and Parks Master plans, Strategic Transportation plans, etc., in order to address the impacts of stormwater management on relevant community values. These values include recreation, agriculture, fisheries, greenways, heritage, archaeology, safety, transportation, economics, property values, flood protection, affordability, the environment, and related issues.

Stormwater management planning would strive to be consistent with the stormwater management guiding principles as referenced in Table 13-1 of the Liquid Waste Management Plan Discussion Document. One of the guiding principles is to strive to plan at a watershed scale even in non-urban (greater than 80% of watershed area is Green Zone as defined in the 1996 Livable Region Strategic Plan) watersheds where municipalities may have limited infrastructure.

Non-Point Source Pollution Management

Pleasure Craft Sewage

P26. Designation of No-Discharge Zones

Where investigations have shown that discharges from pleasure craft is leading to waterway degradation or high bacterial levels, the District will request the province to nominate the waterway, or portion thereof, for designation as a no-discharge zone under the federal Pleasure Craft Sewage Prevention Regulation.

On-Site Sewage Disposal Systems

P27. Sewer Extensions and the Green Zone

Prior to extending sewers into the Green Zone, as defined by The Livable Region Strategic Plan, the District will request municipalities to examine local servicing and alternate advanced treatment systems.

P28. On-site systems and disposal to waterways

The following guidelines should apply regarding discharges from on-site disposal systems to adjacent waterways. Where there is a conflict between these guidelines and Provincial regulations, the regulations will apply:

- Property owners with BC Hydro service and road access should investigate all land based options including approved innovative technologies and demonstrate that such land based options are non-viable solutions prior to any consideration of sewage effluent discharge into an adjacent water body.
- Property owners in "isolated" locations without road access, should investigate conventional land-based options and demonstrate that such land-based options are non-viable solutions prior to any consideration of effective innovative technology or sewage effluent discharge into an adjacent water body.
- The minimum acceptable level of treatment for properties in "isolated" locations having neither BC Hydro service or road access, should be a properly designed septic tank that provides treatment of domestic sewage prior to effluent discharge required to be in accordance with standards stipulated in the new Waste Management Act Municipal Sewage Regulation.
- There should be no discharge of untreated domestic sewage to the marine/aquatic environment under any circumstances.
- Property owners discharging to the marine/aquatic environment should obtain discharge permits from the appropriate jurisdiction.
- Property owners discharging or proposing to discharge effluent into an adjacent water body should obtain a "water body" easement for the placement and maintenance of a discharge outfall pipe, from the appropriate jurisdiction.
- Where the authority having jurisdiction for sewage discharge or sewage disposal is other than the local government, and where the bylaws or policies of the local government stipulate standards or requirements higher than those of the authority having jurisdiction, then the authority having jurisdiction should make best efforts to issue approvals which comply with requirements of the local government.

P29. Assurance Plans

No innovative treatment systems will be installed in the GVRD unless an assurance plan is in place for the proper operation, maintenance, and performance of the facility. The assurance plan will be developed in accordance with guidelines being prepared under the Ministry of Environment, Lands and Parks Municipal Sewage Regulation.

Agricultural Runoff

P30. Stormwater Consideration by Municipalities

Municipalities will consider stormwater runoff from agricultural lands when undertaking integrated stormwater management planning for their municipality.

Finance

P31. Funding Future Projects

In its 10-year financial plan the District will include future projects for upgraded service levels that have been determined to be needed in accordance with Policy P2.

In accordance with Policy P2, upgraded service levels will be provided in the future where an environmental need has been forecasted or demonstrated, with consideration to cost and benefit and regional priorities. Figure 4 shows the probable range in future annual District expenditure. The upper range represents annual expenditures if additional secondary treatment plant upgrading projects are required at Lions Gate and Iona, in accordance with demonstrated need, and they are constructed over a 10-year period commencing after 2005. The lower range represents annual District expenditures assuming no secondary treatment upgrading projects are required at Lions Gate and Iona and that the water quality objectives and other established criteria continue to be met.

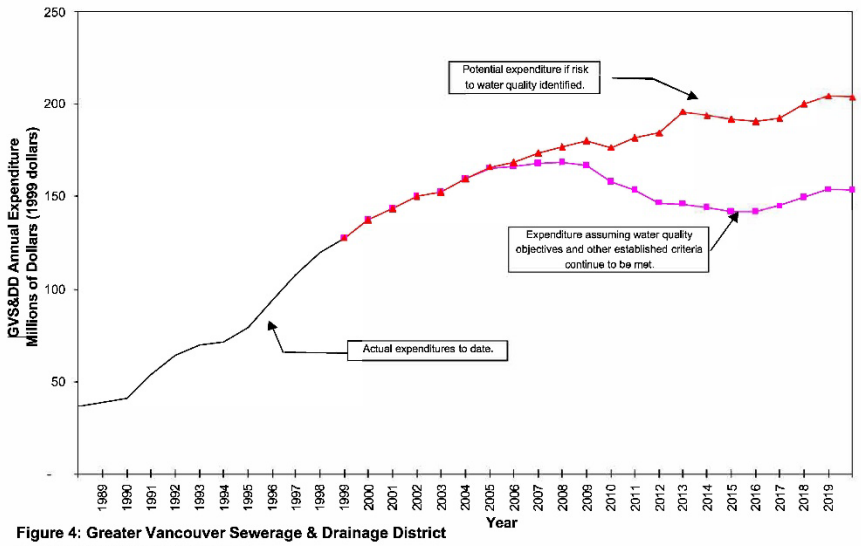


Figure 4: Greater Vancouver Sewerage & Drainage District Liquid Waste Management Plan Potential GVS&DD Expenditure Envelope

To: Liquid Waste Committee

From: Jennifer Crosby, Director, Project Management Office, Project Delivery

Date: November 6, 2024 Meeting Date: November 13, 2024

Subject: **Update on the Development of a Construction Impact Mitigation Framework**

RECOMMENDATION

That the GVS&DD Board receive for information the report dated November 6, 2024, titled "Update on the Development of a Construction Impact Mitigation Framework".

At their meeting on November 6, 2024 the Water Committee received for information the report dated October 16, 2024, titled "Update on the development of a Construction Impact Mitigation Framework". This provides an update to the GVWD/GVS&DD Boards on the development of the Construction Impact Mitigation Framework for member jurisdictions as related to Metro Vancouver's utility capital project construction.

This matter is now before the Liquid Waste Committee for its consideration.

ATTACHMENTS

1. "Update on the Development of a Construction Impact Mitigation Framework", report dated October 16, 2024
2. "Update on the Development of a Construction Impact Mitigation Framework" Presentation

63941041

To: Water Committee

From: Jennifer Crosby, Director - Project Management Office, Project Delivery

Date: October 18, 2024 Meeting Date: November 6, 2024

Subject: **Update on the Development of a Construction Impact Mitigation Framework**

RECOMMENDATION

That the GVWD/GVS&DD Boards receive for information the report dated October 18, 2024, titled "Update on the Development of a Construction Impact Mitigation Framework".

EXECUTIVE SUMMARY

Metro Vancouver staff continue to work with member jurisdictions to review practices to improve how member jurisdictions and Metro Vancouver staff coordinate and liaise on regional infrastructure projects in member jurisdictions.

Construction impacts of Metro Vancouver utility capital projects on member jurisdictions are currently mitigated through case-by-case negotiations directly between Metro Vancouver staff and the member jurisdiction where the project is located. This results in varied levels of mitigation as well as unpredictable and often significant impacts on project scope, cost and schedule.

The Construction Impact Mitigation Framework (the Framework) has been developed as a transparent, consistent, equitable, and fiscally responsible approach to mitigating impacts on member jurisdictions (members) during construction of region-serving utility infrastructure. The Framework enables collaboration between Metro Vancouver staff and members by following a standard approach to assessing and mitigating construction-related impacts. This will support discussions with members in seeking mutually agreeable solutions and reduce risks and uncertainty for project delivery.

PURPOSE

To update the GVWD/GVS&DD Boards on the development of a Construction Impact Mitigation Framework for member jurisdictions as related to Metro Vancouver utility capital project construction.

BACKGROUND

Each year Metro Vancouver delivers utility capital projects to ensure that the region has reliable access to high-quality drinking water, safe wastewater removal and treatment, and waste disposal and recycling. The purpose of delivering these services on behalf of the members is to provide infrastructure at a scale that is more efficient than if each jurisdiction delivered the services separately. As a result, the services offer efficiencies that benefit all members. Members participate in the core services based on the understanding that not only will the benefits of the service be equitably shared amongst participants, but the impacts and costs of delivering those services are also equitably shared.

In 2018, the Metro Vancouver Board rescinded the existing Capital Projects Policy and recommended that Metro Vancouver staff work with advisory committees to develop a capital projects framework, which would capture the approach and process of how Metro Vancouver utility capital projects are planned, managed, and communicated. Metro Vancouver initially engaged with member jurisdictions through a Regional Engineers Advisory Committee (REAC) working group. The working group recommended developing tools to improve the process and communication between Metro Vancouver and member jurisdictions, which include:

Tool Name	Development Status
Utility Capital Projects Guide	Complete
Project Coordination Reference Guide	Complete
Noise and Vibration Guide	Complete
Social Impact Assessment Guide	Complete
Construction Impact Mitigation Framework	Complete

An update on the development of these tools was provided to this committee in a report dated June 21, 2023 (see Attachment 3). The next section provides a further update on the development of the Framework including the Impact Assessment Tool, Mitigation Library and supporting materials.

UPDATE ON THE DEVELOPMENT OF THE CONSTRUCTION IMPACT MITIGATION FRAMEWORK

The development of the Construction Impact Mitigation Framework has been completed, leveraging feedback from Regional Engineers Advisory Committee, Regional Administrators Advisory Committee (RAAC) and Metro Vancouver staff and following the guiding principles of equitability, transparency, consistency, and fiscal responsibility.

The objectives of the Construction Impact Mitigation Framework are:

- To clarify expectations for how Metro Vancouver (MV) and member jurisdictions work together to deliver regional infrastructure.
- To standardize the process for assessing and mitigating the impact of utility capital projects on member jurisdictions.
- To reduce risk and uncertainty related to the delivery of Metro Vancouver utility capital projects, which in turn reduces impacts on costs and schedules.

The Construction Impact Mitigation Framework is comprised of a guide for users, a permitting fact sheet, a template to facilitate use of the Framework and two core deliverables used to assess impacts and plan a construction impact mitigation strategy for a utility capital project (see Attachments 1 and 2):

1. An Impact Assessment Tool that categorizes construction project impacts, and defines impact levels based on high, medium, and low impact; and
2. An Impact Mitigation Library that provides impact-specific mitigation measures that can be used to minimize, offset, or avoid impacts.

Feedback from member jurisdictions on the draft Framework was collected through three rounds of engagement with REAC and RAAC as well as through a workshop and Open House events during MV Conference Day in 2023 and 2024 and an online feedback survey. Overall positive feedback was

received including appreciation for the development of the Framework and support for a consistent, transparent, equitable and fiscally responsible approach to mitigating impacts to all members.

Below is a summary of the changes made to the Framework based on member feedback:

- Clarified impacts to non-MV utilities to include roadway infrastructure including reference to MV Board Policy *Pavement Restoration for Sewer and Water Main Installations*.
- Expanded traffic mitigation examples to include intersection modification, signal changes, enhanced intersection control.
- Revised access mitigation examples to reference access for emergency services and waste/ recycling collection.
- Revised bike trail/routes impact category to include pedestrian trails/ routes.

Based on feedback received, the following language was incorporated into the Framework guide:

- The Framework provides a clear process for MV and members to follow to enable expedited decision-making.
- The guide outlines the process whereby it is the collective suite of impacts and mitigations for the given projects; it is not necessary for each impact and mitigation intensity to match.
- Each MV utility capital project has an assigned liaison.
- The Framework outlines a collaborative process to avoid, minimize or mitigate construction impacts which in some cases will result in a “build back better” approach.
- The Framework guide speaks to monitoring quality and effectiveness of the impact mitigation measures during construction. MV is to refine mitigation measures if initial plans are insufficient, or when there is change in construction schedule or scope.
- Early collaboration with member jurisdictions on MV utility capital projects is enabled through various activities throughout the project lifecycle, as outlined in the Guide to Metro Vancouver Utility Capital Projects for Member Jurisdictions available on the MV internet site.

The feedback summarized in the table below is either out of scope for the Framework or is addressed elsewhere.

Feedback	**Response**
Broaden scope to include impacts or opportunities related to municipal planned work such as streetscape and greenway projects.	MV engages annually on the capital program with members at municipal coordination meetings which enables coordination of schedules. MV works with member jurisdictions to align restoration efforts with municipal plans for streetscapes and greenways. MV considers incorporation of member jurisdiction requested and funded scope into MV utility capital projects through Coordinated Works Agreements where appropriate.

Feedback	Response
Assessing and managing cumulative impacts of multiple MV projects on a member jurisdiction.	The Framework is intended to support individual projects. Accounting for impacts across a portfolio of projects to a member jurisdiction is out of scope for this initial version of the Framework.
Provision of funding for facilitating, approving and monitoring member permitting processes.	Permit fees are intended to cover these costs. Members have the option to delegate BC Building Code oversight to a qualified professional. In the guide to the Framework, it is noted that for large projects, custom agreements can be developed to formalize submission requirements, approvals, fees, timelines and resource commitments.
Consistent, transparent and equitable approach for quantifying land use impacts related to: • Concerns related to compensation for hosting infrastructure on land not designated for profitable development e.g. parkland • Concerns for the unfair burden of hosting multiple MV infrastructure projects	MV is considering establishing principles for assessing above-ground loss of use methodology. Currently, compensation may be payable if the land in question is investment land or if they are required for future municipal development lands. If compensation is payable, Metro Vancouver will compensate member jurisdictions for acquisition of land rights following the guiding principles of consistency, equity, transparency, and fiscal responsibility. In cases where Metro Vancouver requires land rights from members for a project, the tax payer should not be expected to pay for those lands which are already in the public realm, and where lands will be returned to the same general use following the project's completion.
Weighting criteria for the impact categories.	The Framework is intended to be a tool to enable collaboration between MV and members. Due to the variability in impacts felt by members for each project scope and location, no weighting criteria has been included at this time.
Compensation in lieu of mitigations(s) or transferring responsibility for impact mitigation (e.g. site restoration) to member jurisdictions.	MV is responsible for mitigating construction impacts due to utility capital projects. Requests for compensation in lieu of mitigations(s) will be handled on a case-by-case basis.

The Framework is expected to be refined over time as projects are completed and mitigations are monitored and documented.

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

FINANCIAL IMPLICATIONS

The development of standardized, region-wide approach to mitigation of impacts for projects undertaken in member jurisdictions will help to manage project costs, maintain project schedules, mitigate scope creep and change orders on construction projects, as well as ensure a consistent, transparent and equitable approach across all member jurisdictions.

CONCLUSION

Metro Vancouver is committed to the continuous improvement of its processes to deliver region-serving utility infrastructure projects efficiently and cost effectively, and to mitigate the construction impacts of these projects on member jurisdictions.

Metro Vancouver has liaised with the REAC and the RAAC to develop the Construction Impact Mitigation Framework based on the guiding principles of consistency, equity, transparency and fiscal responsibility. The Framework enables collaboration between Metro Vancouver staff and members by following a standard approach to assessing and mitigating construction-related impacts. This will support discussions with members in seeking mutually agreeable solutions and reduce risks and uncertainty for project scope, schedule and cost.

The Framework is being presented to Water Committee and the GVWD/GVS&DD Boards in November followed by a launch to Metro Vancouver and member staff in the first quarter of 2025.

ATTACHMENTS

1. MV Utility Capital Projects - Construction Impact Mitigation Framework Overview.
2. Construction Impact Mitigation Framework Guide.
3. Guide to Metro Vancouver Utility Capital Projects for Member Jurisdictions and Impact Mitigation Framework, report dated June 21, 2023.
4. MV Utility Capital Projects – Construction Impact Mitigation Framework - Presentation

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MV Utility Capital Projects - Construction Impact Mitigation Framework

The Construction Impact Mitigation Framework (the framework) is a transparent, consistent, equitable, and fiscally responsible approach to mitigating impacts on member jurisdictions (members) during construction of region-serving utility infrastructure. The framework supports the delivery of MV utility capital projects and enhances coordination and communication with members and member permitting processes.

The framework enables collaboration between MV staff and members by following a standard approach to assessing and mitigating construction-related impacts. This will support discussions with members in seeking mutually agreeable solutions and reduce risks and uncertainty for project delivery. This framework increases the ability for projects to stay on time and on schedule and will enable improved delivery of capital projects across the region.

The Framework will achieve this by:

- Identifying categories of impacts experienced by members
- Establishing common and consistent language
- Providing examples of mitigation measures
- Providing a template to document and refine anticipated impacts and planned mitigation measures in an iterative manner
- Enabling the creation of a common database of impacts and mitigation measures

To support the development of the framework, Metro Vancouver has regularly liaised with the Regional Engineers Advisory Committee (REAC) and the Regional Administrators Advisory Committee (RAAC) and leveraged feedback from REAC, RAAC and Metro Vancouver staff to develop the framework.

Structure of the Framework

The framework consists of **two core deliverables**:

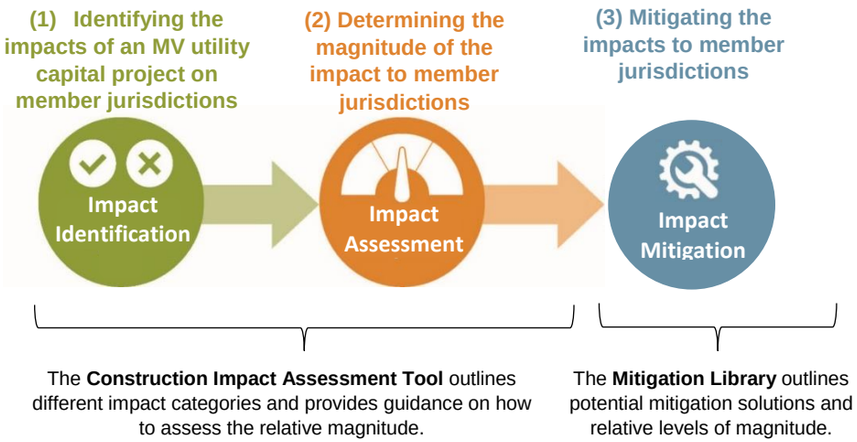
- A **Construction Impact Assessment Tool** containing a list of potential construction impacts and criteria for classifying each impact as either low, medium or high.
- A **Mitigation Library** that provides impact-specific mitigation measures that can be used to avoid, minimize or offset impacts.

Supporting deliverables for implementation of the framework include:

- **Framework Guide**: Introduction to the framework and guidance on implementation.
- **Permitting Fact Sheet**: Information on permitting requirements for Metro Vancouver utility capital projects in member jurisdictions.
- **Standardized template**: to facilitate use of the framework and document impacts and mitigation measures.

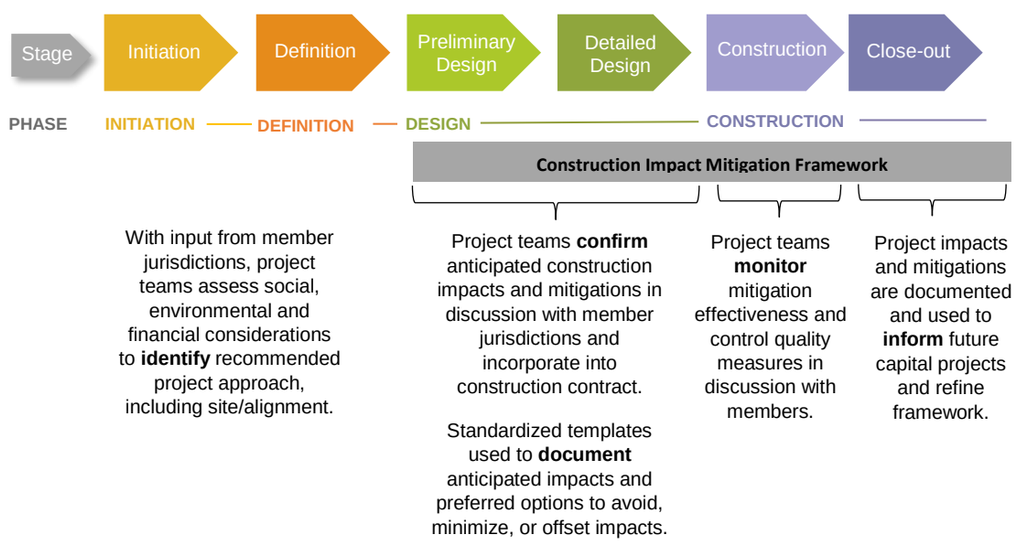
OVERVIEW

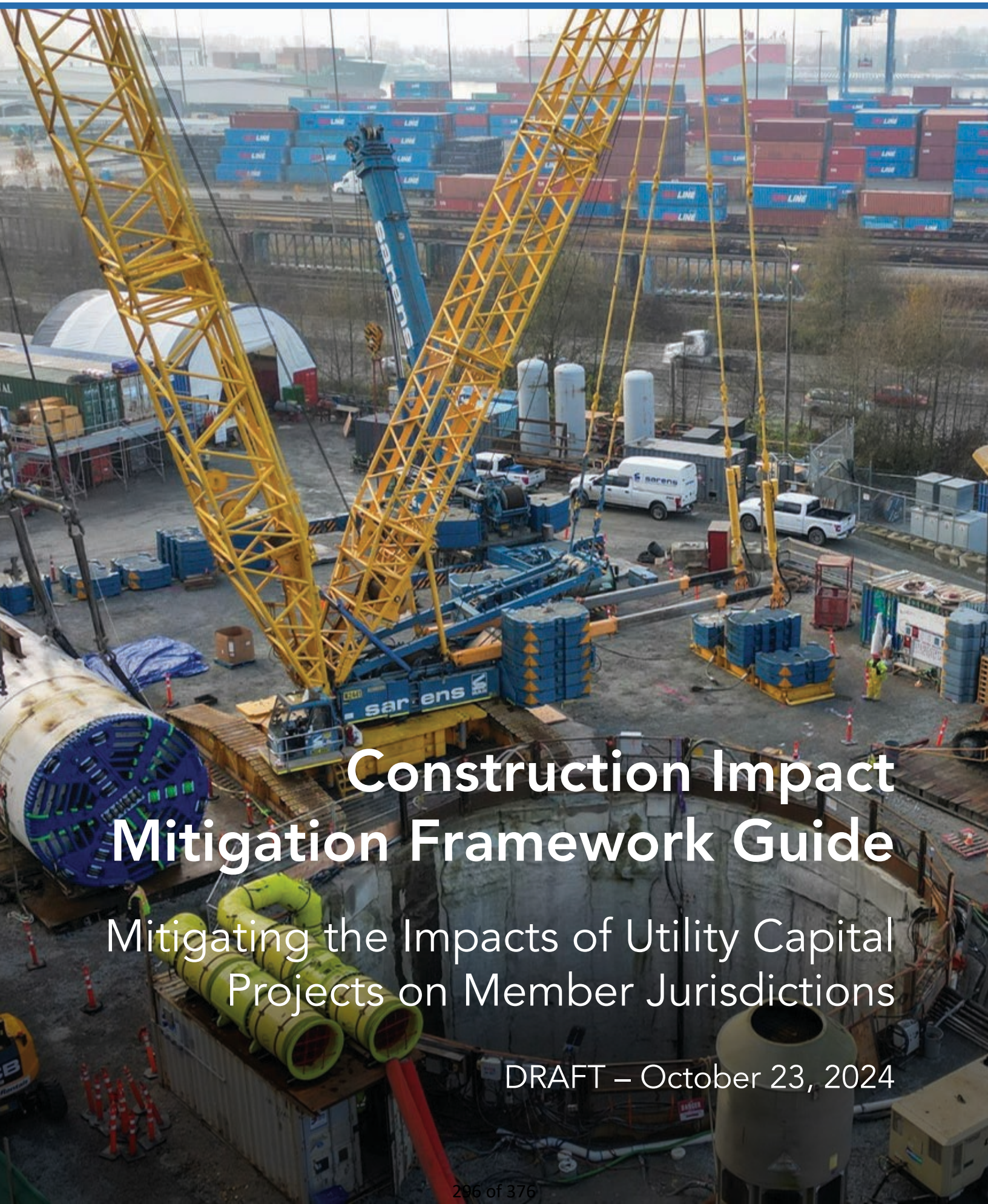
A 3-step **approach** using the core deliverables is the basis for the framework:



How will the Framework be Used?

Metro Vancouver project teams undertaking Preliminary Design and Detailed Design stages will utilize this Construction Impact Mitigation Framework in collaboration with members to identify, assess and document impacts and planned mitigation solutions that will be implemented during the construction stage and monitored for quality and effectiveness.





Construction Impact Mitigation Framework Guide

Mitigating the Impacts of Utility Capital Projects on Member Jurisdictions

DRAFT – October 23, 2024

Metro Vancouver acknowledges that the region’s residents live, work, and learn on the shared territories of many Indigenous peoples, including 10 local First Nations: q̓icə̓y̓ (Katzie), q̓ʷɑ:n̓ƛ̓ən̓ (Kwantlen), kʷikʷəƛ̓əm (Kwikwetlem), máthxwi (Matsqui), xʷməθkʷəy̓əm (Musqueam), qiqéyt (Qayqayt), se’mya’me (Semiahmoo), Sḵwx̱wú7mesh Úxwumixw (Squamish), scəw̓aθən məsteyəxʷ (Tsawwassen) and səlilwətaɬ (Tsleil-Waututh).

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

Construction Impact Mitigation Framework Guide
Mitigating the Impacts of Utility Capital Projects on Member Jurisdictions

DRAFT – October 23, 2024

Developed for Metro Vancouver by:

KPMG

For more information or to provide feedback please contact Metro Vancouver Information Centre.
Phone: 604-432-6200
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Cover: Annacis Water Supply Tunnel construction

Table of Contents

Executive Summary

The Construction Impact Mitigation Framework is a transparent, consistent, equitable, and fiscally responsible approach to mitigating impacts on member jurisdictions during construction of region-serving utility infrastructure. The framework supports the delivery of Metro Vancouver utility capital projects and enhances coordination and communication with members and member permitting processes.

The framework enables collaboration between Metro Vancouver staff and members by following a standard approach to assessing and mitigating construction-related impacts. This will support discussions with members in seeking mutually agreeable solutions and reduce risks and uncertainty for project delivery.

Annacis Water Supply Tunnel construction

Central Park Water Main construction

Introduction

This guide refers to the Metro Vancouver utility capital projects for water, liquid waste, and solid waste. Metro Vancouver utility capital projects include construction of new infrastructure as well as the expansion or replacement of existing infrastructure.

Metro Vancouver plans and delivers utility capital projects to meet the needs of a growing population, maintain, upgrade and replace aging infrastructure, and increase the region's resilience to the impacts of climate change, seismic events, wildfires, power failures, and natural disasters. These projects are required to maintain the quality and reliability of the region's drinking water, wastewater, and solid waste management systems and continue to protect public health and the environment. Utility capital projects can be site-specific, such as a wastewater treatment plant, or a linear alignment, such as a water main.

Metro Vancouver delivers these services on behalf of our members to provide infrastructure at a scale that is more efficient than if each jurisdiction delivered the services separately. As a result, the services offer efficiencies that benefit all members. Members participate in these services based on the understanding that not only will the benefits of the services be shared amongst participants, but the impacts and costs of delivering those services are also shared.

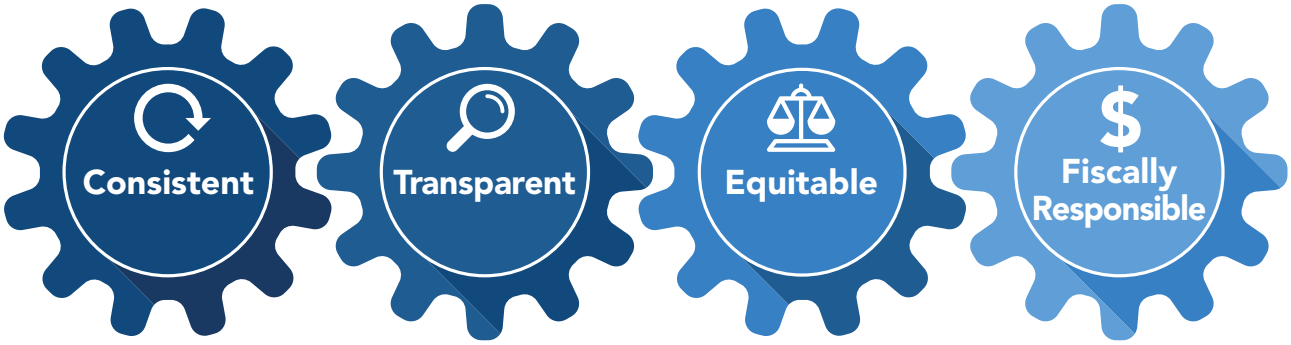
Metro Vancouver's Member Jurisdictions

- Village of Anmore
- Village of Belcarra
- Bowen Island Municipality
- City of Burnaby
- City of Coquitlam
- City of Delta
- Electoral Area A
- City of Langley
- Township of Langley
- Village of Lions Bay
- City of Maple Ridge
- City of New Westminster
- City of North Vancouver
- District of North Vancouver
- City of Pitt Meadows
- City of Port Coquitlam
- City of Port Moody
- City of Richmond
- City of Surrey
- Tsawwassen First Nation
- City of Vancouver
- District of West Vancouver
- City of White Rock

Purpose of the Construction Impact Mitigation Framework

The Construction Impact Mitigation Framework is intended to provide guidance for Metro Vancouver project teams and member staff for assessing construction impacts and applying mitigations to regional capital utility projects by:

- Establishing a **transparent process**;
- Maintaining a **consistent approach** for all capital utility projects regardless of location, size or complexity;
- Providing an **equitable framework** with structured but flexible tools; and
- Being **fiscally responsible** to maintain project schedules and budgets through proactive integration of mitigations.



The framework supports the delivery of utility capital projects, enhances coordination and communication with members and supports member permitting processes (see **Appendix A**). It also supports discussions with members in seeking mutually agreeable solutions to mitigate construction impacts and reduces risk and uncertainty for capital project delivery, which in turn reduces impacts to project costs and schedules. The framework will achieve this by:

- Identifying categories of impacts experienced by members (see **Appendix B**).
- Establishing common and consistent language.
- Providing examples of mitigation measures (see **Appendix C**).
- Providing a template for Metro Vancouver to document and refine anticipated impacts and planned mitigation measures in an iterative manner (see **Appendix D**).
- Enabling the creation of a common database of impacts and mitigation measures.

Collaboration with Members

This framework has been developed to better support collaboration with members for construction impact assessment and mitigation options by simplifying the process of reaching consensus, while providing flexibility to apply mitigations appropriate for each utility capital project.

Metro Vancouver project teams should use judgement for the scale and complexity of the project in assessing impacts and mitigations, and on seeking alignment with members. In some cases, exceptional circumstances may lead to a mitigation beyond common practice. Depending on the cost and complexity, some mitigations may result in reviews and approvals outside the project team, including possible Board approval.

Metro Vancouver may also incorporate member-requested and funded work into a utility capital project through a Coordinated Works Agreement.

The intent of the framework is to consider the combined project impacts and mitigations so the combined suite of mitigation measures balances the project's construction impacts.

Benefits to Metro Vancouver and Members

This framework has inherent benefits to Metro Vancouver and members. By establishing a common approach to impacts and mitigations, and clarifying the process to develop mutually agreeable solutions, project risks and uncertainty will be reduced overall. This approach will increase the ability for projects to stay on time and on schedule, improving the stability and predictability of utility rates, and will bring overall transparency to capital project delivery across the region.

Global Mitigations

This framework is focused on project-specific impacts and mitigations with the understanding that several 'global' mitigations will be integrated into any project regardless of size, scale, complexity, or location. These global mitigations include compliance with regulatory requirements and professional responsibilities, and are intended to minimize disturbance and align with best practices.

The examples of impacts and mitigations provided in the framework are a starting point. As new tools, information, and approaches on construction impacts and mitigations become known, Metro Vancouver will update this framework to reflect those practices.

Examples of global mitigation measures to be applied to all projects include:

- Compliance with environmental regulations
- Adherence to required permits, licensing, and approvals
- A Metro Vancouver point-of-contact to liaise with member jurisdictions in the respective project area
- Engaging with the public through community meetings, surveys, signage and outreach events to raise awareness about the upcoming construction project
- Refining the mitigation strategy if mitigations are insufficient, or if there is change in construction schedule or scope

Framework Exclusions

There are some items that are not addressed in the framework. These are outlined below with the rationale for each exclusion.

Exclusion	Rationale
Operational, maintenance and emergency response impacts associated with Metro Vancouver infrastructure in member jurisdictions	Framework addresses construction related impacts only
Impacts associated with perceived or realized loss of opportunity (e.g., taxes, amenity cost charges) related to private lands acquired by Metro Vancouver for the project	GVSDD and GVWD are exempted from paying property taxes* Amenity cost charges are not applicable to Metro Vancouver utility capital projects
Provision of net new community amenities (e.g., trails, playgrounds, public art)	Mandate of Metro Vancouver utility capital projects are to provide regional services. Requests for provision of net new community amenities in lieu of mitigation measures will be handled on a case-by-case basis
Impacts on Metro Vancouver projects due to member decisions/actions	Framework is focused on mitigating impacts of utility capital projects on members
Cumulative impacts of Metro Vancouver utility capital projects	Framework is for use on individual utility capital projects. Metro Vancouver liaises regularly with members to coordinate where there are multiple concurrent projects in an area
Compensation in lieu of mitigations(s) or transferring responsibility for impact mitigation (e.g., site restoration) to member jurisdiction	Metro Vancouver is responsible for mitigating construction impacts due to utility capital projects. Requests for compensation in lieu of mitigations(s) will be handled on a case-by-case basis

* Section 65 of the Greater Vancouver Sewerage and Drainage District Act and Section 81 of the Greater Vancouver Water District Act

How to Use the Framework

The following section outlines the structure of the framework, available tools, roles for Metro Vancouver and members, and additional guidance on assessing impacts and mitigations.

Structure of the Framework

The framework consists of two core components:

1. The **Construction Impact Assessment Tool (Appendix B)** breaks down construction impacts into categories, and each category into a 'level of impact': low, medium, and high. Each level provides a description of a low, medium and high scenario for the respective category, along with an example to provide insight for determining the impact metric.
2. The **Mitigation Library (Appendix C)** consists of the same categories identified in the Construction Impact Assessment Tool, with metrics looking at how different solutions can balance the magnitude of the impact identified for a construction project. The metrics look at the 'level of mitigation solution(s)' through three levels: low intensity, medium intensity, and high intensity. Similar to the assessment tool, each level consists of a description of the mitigation solution for the category, along with examples of what the solution could look like through application.

Note: while an impact category may have been rated as high, this does not mean the respective mitigation solution would automatically be high intensity. The collective impacts and collective mitigations need to be considered for any given construction project. When assessing mitigation measures, consider what would be reasonable for the member itself to implement as a mitigation measure when carrying out its own publicly funded utility construction projects.

Supporting materials are included to provide additional guidance in the identification, review and integration of construction impacts and mitigations. These include:

- A **Permitting Fact Sheet (Appendix A)** to provide information on member jurisdiction permitting processes that may inform the impacts or mitigations.
- A **Project Impact Mitigation Template (Appendix D)** to document the impacts and mitigations. Metro Vancouver project teams will document and maintain records on discussions and decisions as part of the project records.

Project Lifecycle Application

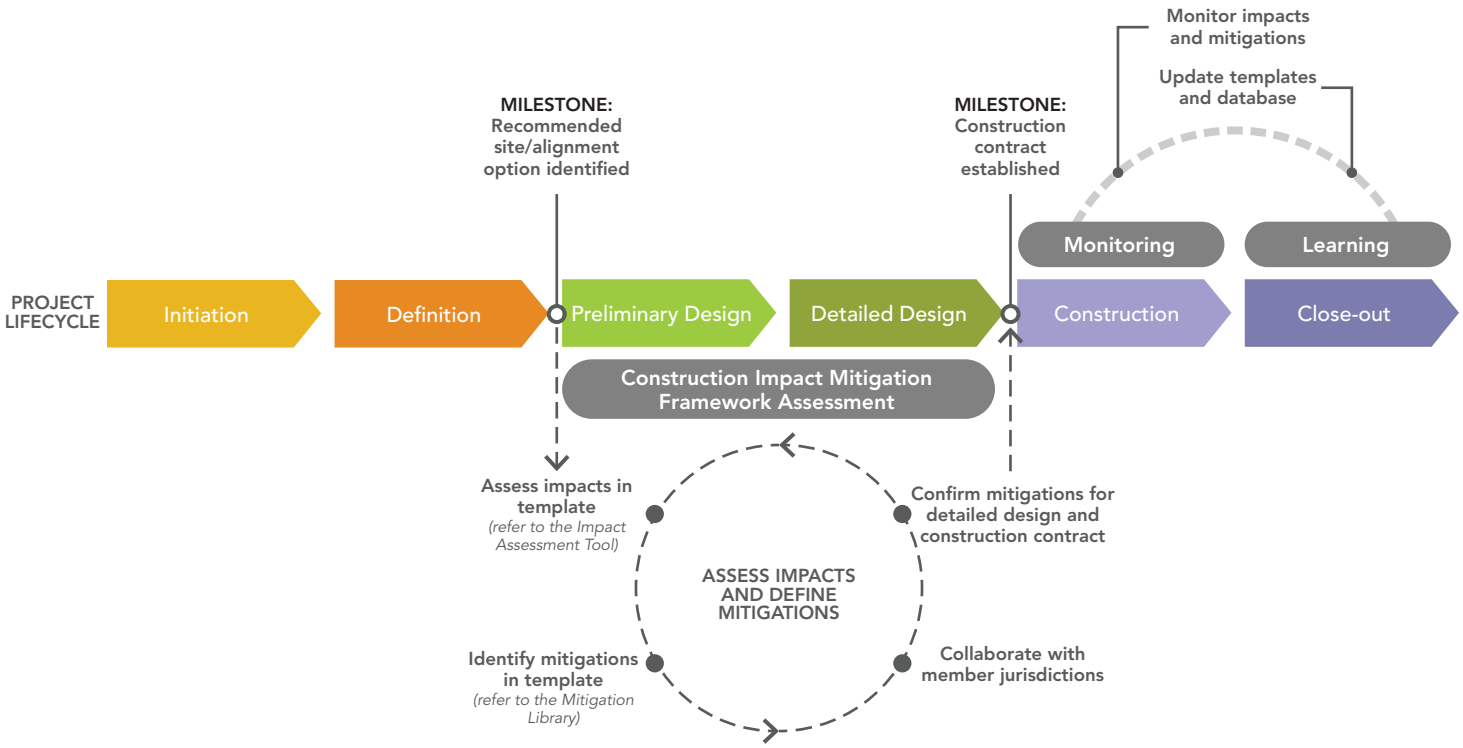
The application of the Construction Impact Mitigation Framework within the project lifecycle is illustrated below.

The Construction Impact Mitigation Framework is used during the design stages in preparation for construction activities. It is intended to be used once a preferred site or alignment is confirmed during the project definition stage, where Metro Vancouver assesses social[1], environmental and financial considerations to evaluate various project options.

Metro Vancouver project teams undertaking Preliminary Design and Detailed Design stages should utilize this Construction Impact Mitigation Framework in collaboration with members to identify, assess and document impacts and planned mitigation solutions that will be implemented during the construction stage and monitored for quality and effectiveness.

As part of the project close-out, both impacts and mitigation solutions will be documented in a database of impacts and mitigation measures for others to learn from, and to further refine the framework.

An iterative and collaborative approach to assessing and mitigating impacts during project lifecycle stages



1 The Metro Vancouver Social Impact Assessment Guide informs site/alignment options analysis. Should the project site or alignment be revisited in the course of Preliminary Design or Detailed Design, Metro Vancouver will re-evaluate social, environmental and financial considerations

Preliminary Design and Detailed Design stages

Starting at the Preliminary Design stage, the project team will complete the Construction Impact Mitigation Template (**Appendix D**) by:

A. Referring to the Construction Impact Assessment Tool (**Appendix B**) and the social, environmental and financial assessments completed during the Definition stage to identify which impacts are applicable to the project and their relative level of magnitude.

B. Referring to the Mitigation Library (**Appendix C**) to identify potential mitigation solution(s) that can offset the identified impacts. The high, medium, and low intensity categories are a guide to help assess the overall order of magnitude of the mitigation solutions.

C. Collaborating with members to discuss initial options and considerations related to potential impacts and mitigation solutions.

D. Confirming impacts and, specifically, mitigation solutions that will be integrated into the construction contract.

Once completed, the template establishes a baseline impact mitigation strategy. Depending on the scope, scale and complexity of the project, the strategy may need to be revised throughout the design phase in an iterative manner until design is complete.

Note: While the order of magnitude levels is intended for general guidance, a high impact does not necessarily require a high intensity mitigation solution. The intent of the framework is to identify a suite of mitigation solutions that collectively balance out the projects' construction impacts. For example, a high impact in one category may have multiple low intensity mitigation solutions.

Construction and Close-out stages

Metro Vancouver should monitor and refine the mitigation strategy to ensure quality and effectiveness and communicate with members through regular progress updates. Upon completion of construction, Metro Vancouver will update project templates with impact assessment(s) and mitigation solutions utilized.

Roles

The following roles for Metro Vancouver and members are outlined for each stage of the project lifecycle. Depending on the scope, scale and complexity of the project, the mitigation strategy may need to be revised throughout the design phase in an iterative manner until design is complete.

Lifecycle Stage	Initiation/ Definition	Preliminary Design/ Detailed Design	Construction	Close-out
		Construction Impact Mitigation Framework		
Overview	Project teams assess social[2], environmental and financial considerations to identify recommended site/alignment option.	Project team will identify and confirm anticipated construction impacts and mitigations based on a confirmed design and incorporate into construction contract. Standardized templates will be used to document anticipated impacts and preferred options to avoid, minimize, or offset impacts.	Project team will monitor mitigation effectiveness and control quality measures in discussion with members.	Completed templates and database used to inform future capital project delivery and refine framework.
Metro Vancouver Role	Gather and analyse social, environmental and financial information to assess site/alignment options.	Use the Construction Impact Assessment Tool and Mitigation Library to fill out the Project Impact Mitigation Template to identify and assess impacts, mitigations, estimated cost of mitigations, and an estimated timeframe. Liaise with member(s) to review and assess potential impacts and mitigations.	Monitor and refine the mitigation strategy to ensure quality and effectiveness and communicate with members through regular project progress updates.	Update templates and database with impact assessment(s) and final mitigation solutions.
Member Jurisdiction Role	Share information related to local considerations.	Review the identified impacts and mitigations and provide input.	Proactively communicate quality issues with mitigation solutions as they arise.	Share reflections on what worked and what could be improved to refine the framework.

2 The Metro Vancouver Social Impact Assessment Guide informs site/alignment options analysis. Should the project site or alignment be revisited in the course of Preliminary Design or Detailed Design, Metro Vancouver will re-evaluate social, environmental and financial considerations

Assessing Levels of Impacts and Mitigations

When determining whether the level of impact is low, medium or high for a category, or whether a mitigation is low, medium, or high intensity, it is necessary to consider two concepts:

1. The assessment is based on the best information available at the time
2. Impacts and mitigations will be monitored during construction and updated as required.

Furthermore, when a potential mitigation option is identified, it may not be appropriate for other projects.

Project managers have overall accountability for projects; they are responsible for ensuring appropriate and qualified individuals are engaged and involved in discussion of impact identification and mitigation planning. Metro Vancouver project teams need to exercise judgement and work with members to come up with a suite of appropriate mitigation strategies based on the combination of impacts.

Each category undergoing impact and mitigation evaluations should maintain the guiding principles of equity, transparency, consistency, and fiscal responsibility.

Tracking Impacts and Mitigations

Metro Vancouver, in collaboration with member jurisdictions, consultants, and contractors, actively and continuously improves its capital delivery practices. With this approach, the framework will be updated periodically to reflect these changes.

The ongoing use of this framework will contribute to the improvement of construction projects by tracking impacts and mitigations over time, and build a deeper understanding of what works and what can be improved. Metro Vancouver will collect feedback as part of the close-out stage of the project lifecycle, which will be used to update this framework, and contribute to continuous improvement of capital project delivery.

References to the completed project impact mitigation templates is intended to be a resource for Metro Vancouver and member jurisdiction staff. The impact assessment intensity and agreed upon mitigation solutions will vary from project to project.

Appendix A – Permitting Fact Sheet

metrovancouver

Metro Vancouver obtains permits from members for utility capital projects. This fact sheet is an informational document to support collaboration between Metro Vancouver and member jurisdiction staff to navigate member jurisdiction permitting requirements. The purpose of this fact sheet is to:

1. Clarify responsibilities and provide resources to help project teams. This information is applicable to all capital projects, however, project-specific variances may be needed.
2. Supplement the Construction Impact Mitigation Framework by providing an outline of applicable member jurisdiction permits that may be required for utility capital projects.
3. Recognize that regulatory and permitting processes can be significant cost and schedule drivers, and to outline permitting considerations that support the framework's guiding principles of providing a transparent, consistent, equitable, and fiscally responsible approach to mitigations during construction of essential region-serving infrastructure.

Note: In addition to permits issued by members, utility capital projects may require permits or approvals from other levels of government, Technical Safety BC, Port of Vancouver, BC Hydro, etc. Authorizations or approvals from other agencies may be prerequisites to acquiring member jurisdiction permits.

Why are members involved in regulating the construction of buildings for Metro Vancouver projects?

Metro Vancouver Regional District does not regulate the construction of buildings outside Electoral Area A as the Greater Vancouver Sewerage & Drainage District and Greater Vancouver Water Districts do not have statutory authority to regulate the construction of buildings.

Metro Vancouver's member municipalities typically regulate in respect to the construction of buildings within their areas, pursuant to the Community Charter and the Vancouver Charter. Metro Vancouver Regional District regulates in respect of the construction of buildings in Electoral Area A, pursuant to the Local Government Act. Tsawwassen First Nation regulates in respect to the construction of buildings within its treaty area pursuant to the Tsawwassen Land Use Planning and Development Act. Typically, regulation includes issuing permits to build and occupy, establishing permit fees, carrying out inspections, and the like.

Early and ongoing collaboration is key to efficient permitting and project success.

Metro Vancouver works closely with members on the planning and delivery of utility capital projects to identify impacts and mitigation measures, and seek approvals for required permits. Early collaboration between Metro Vancouver and members is necessary to align on which permits, approvals, and related processes are needed so that these requirements can be considered in project schedules, budgets, and contracts. As the project progresses, ongoing and proactive management of the permitting process reduces delays and schedule-related costs for delivery of Metro Vancouver projects.

Member jurisdiction permitting processes are often related to potential impacts on the member jurisdiction (e.g., road use, noise). Permitting requirements vary depending on the nature of the utility capital project. In some cases, a member's bylaws may allow it to exercise discretion to allow for exceptions to, or exemptions from, specific permits and approvals.

Why is Metro Vancouver required to pay fees to submit permit applications?

Permit application fees are charged by members to offset their internal costs for administering permit applications and enforcing permit conditions. Permit application fees are not compensation for mitigating project impacts.

Under Section 55(2)(b) of the Community Charter, member jurisdictions may, by bylaw, authorize a building inspector to require building permit applicants to provide a certification by a qualified professional that the submitted plans comply with the BC Building Code and other legal requirements. Under Section 743 of the Local Government Act, municipal liability is limited when relying on the certification of a qualified professional. If a qualified professional is engaged to provide a compliance certification, permit application fees must be reduced.

Preliminary Design | Detailed Design | Construction

KEY CONSIDERATIONS

At the preliminary design phase, it is critical that Metro Vancouver and member jurisdiction staff meet to align on matters such as:

- **Collaboration and ongoing coordination** expectations throughout the design and construction phases
- **Required permits, approvals, and other mechanisms** that allow members to provide input and oversight
- **Submission requirements, resource commitments, and timelines** that allow for cost-effective and timely approval processes

Most permit applications are submitted during the detailed design phase. To maintain project timelines, collaboration and communication should continue through:

- **Active oversight** by Metro Vancouver and member jurisdiction staff to address potential roadblocks
- **Regular meetings** between Metro Vancouver project team and member jurisdiction staff to align expectations, resourcing, and timelines
- **Site visits and regular meetings** during permit application review to address issues early, monitor timelines, and avoid unnecessary delays

After tender award(s), Metro Vancouver oversees the project through the completion of construction. Some permits will be obtained during construction by contractors just prior to undertaking the activity that triggers the permit or approval.

Regular communication between Metro Vancouver and members should continue during this phase to oversee construction-related permits and approvals and actively manage issues, including public concerns and inquiries.

Note: For highest value, risk, and complexity utility capital projects, a signed Project Agreement between Metro Vancouver and a member may be suitable. Project Agreements can be leveraged to formalize certain aspects of the permitting process, including submission requirements, approvals, fees, timelines, and resource commitments. By formalizing the permitting process, Project Agreements can add certainty to the roles and responsibilities of Metro Vancouver and member jurisdiction staff, reducing the potential for increased costs and delays.

Preliminary Design	Detailed Design	Construction
KEY OUTCOMES		
• Permitting assessment and permit summary prepared by Metro Vancouver and reviewed by member • Meetings and workshops between Metro Vancouver and member • Engagement with First Nations, the public, and senior government officials, as required	• Engagement with First Nations, the public, and senior government officials, as required. • Permit applications submitted by Metro Vancouver • Permits and approvals issued by member jurisdiction • Presentations to Mayor and Council, as appropriate	• Regular meetings and site visits • Engagement with First Nations, the public, and senior government officials, as required • Construction permit applications submitted by contractors or Metro Vancouver • Permits and approvals issued by member jurisdiction • Respond to public inquiries

Note: All Metro Vancouver utility capital project permit application forms must be signed by Metro Vancouver's Chief Administrative Officer/Commissioner or delegate. Permit applications will be approved by member jurisdiction staff or by Mayor and Council and may require public engagement and First Nations consultation processes.

Note: Metro Vancouver and members can enter into an Operation Agreement that covers a variety of operations and maintenance activities of a particular utility to formalize the parties' ongoing relationship by, among other things, establishing a set of mutual expectations for notifications, approvals, and submissions.

Typical Member Jurisdiction Permits

Below are examples of typical permits that member jurisdictions may require for utility capital projects. Metro Vancouver and members should work together to identify the permits that are necessary for a given utility capital project and reduce typical review times as much as possible. Permit application review timelines are driven by several factors, such as:

1. Availability of staff
2. Backlog of permit applications
3. Timing of review panel or council meetings
4. Complexity of project and issues
5. Requirements for public engagement and First Nations consultation
6. Departments involved in application review (e.g., engineering, parks, planning, fire department)
7. Coordination with other permitting agencies (e.g., federal, provincial, other utilities, etc.)
8. Coordination with other utilities

Permit or Approval	What is it required for?	When is it applied for?	Typical review timelines
Building Permit	To construct buildings or structures as specified in a bylaw.	Prior to construction of buildings and structures that require permit per member bylaws or BC Building Code	6 months to 2 years
Building Occupancy Permit	Prior to occupying a building.	During construction, prior to building occupancy	2 to 3 months
Development Permit	If the project site is within a designated Development Permit Area and no exemptions apply.	During detailed design	3 to 6 months
Demolition Permit	Demolishing a building or structure as specified in a bylaw.	During construction, prior to demolition of buildings and structures	3 to 6 months
Discharge Permit[3,4]	If activities during construction or operation result in the discharge of wastewater, contaminated groundwater, or stormwater into sewer or surrounding environment.	Prior to or during construction, in advance of any activities that may result in discharge	1 to 2 months
Noise Bylaw Exemption	If construction activities do not adhere to Noise Bylaw (e.g., outside of hours or above decibel levels).	During construction, prior to activity requiring exemption	3 to 4 months
Rezoning Approval	If current zoning on the property does not allow for planned site use.	During detailed design	6 months to 2 years
Road/Highway Use Permit	If member jurisdiction roads will be required for material or equipment storage, or as workspace or use for transporting equipment (e.g., where traffic controls involved to enter/exit site).	During construction, prior to activity requiring road use	1 to 2 months
Soil Removal Permit	If soil is removed from site, or if fill is brought to site above an amount specified in a soil bylaw.	During construction, prior to soil removal or addition of fill above amount specified in bylaw	1 to 2 months
Subdivision Approval	Subdividing a property or consolidating two or more properties into one lot.	During detailed design	6 months to 2 years
Tree Removal Permit	Removal of trees that are above the size specified in a tree bylaw.	Prior to tree removal	2 to 4 months
Various occupancy permits: safety, electrical, gas, plumbing, water/ wastewater connection permits	To complete commissioning of building and site infrastructure to meet the building code and connect to member jurisdiction services.	During construction, prior to completing building and site infrastructure construction	1 to 2 months

3 Issuing agency depends on discharge location (i.e., Metro Vancouver or member jurisdiction sewer, receiving environment)

4 A waste discharge authorization may also be required under the Environmental Management Act

Appendix B – Construction Impact Assessment Tool

The Construction Impact Assessment Tool guides identification of impacts and assessment of impact magnitude.

#	Impact Category	Low Level of Impact	Medium Level of Impact	High Level of Impact
1.	**Access disruption to businesses and residential properties**	Minimal or limited access disruption to businesses or residential properties are anticipated as a result of the planned works. **Example:** Some businesses or residential properties may experience some impact to reduced access points. Access disruptions can be resolved with minimal detours or accommodations.	Moderate/notable access disruption to businesses or residential properties are anticipated as a result of the planned works. **Example:** A substantial number of businesses or residential properties in the impacted area are anticipated to experience some reduction in access points. Access disruptions can be resolved with reasonable detours (e.g., no substantive change to business operation plans).	Substantial access disruption to businesses or residential properties are anticipated as a result of the planned works. **Example:** The majority of businesses and residential properties in the impacted area are anticipated to experience substantially less access via previous access points. Only available resolutions include major detours or accommodations (e.g., changing access hours, mode of access,etc.).
2.	**Traffic congestion impacting businesses and residents**	Limited additional traffic congestion is anticipated to impact businesses, residents or commuters as a result of planned works. **Example:** Some businesses within impacted area are anticipated to experience some impacts to business operations which require limited accommodations during construction period.	Moderately more severe traffic congestion is anticipated to impact businesses, residents or commuters as a result of planned works. **Example:** Some businesses within impacted area are anticipated to experience some impacts to business operations which can be reasonably accommodated.	Substantially more severe traffic congestion is anticipated to impact businesses, residents or commuters as a result of planned works. **Example:** The majority of businesses within the impacted area are anticipated to experience prolonged (e.g. >6 months) impacts to business operations (e.g., requiring major retooling of business operations) as a direct result of planned works.
3.	**Dust or odour**	Few complaints related to dust or odour are anticipated as a result of planned works. **Example:** Some complaints are anticipated to be received over the construction period with limited to no recurrence observed.	Moderately high number of complaints related to dust or odour are anticipated as a result of planned works. **Example:** Periodic instances of higher-than-normal complaints are anticipated to be received during construction, from a variety of parties. There may be occasional recurrences over the same period.	Substantially high number of complaints related to dust or odour are anticipated as a result of planned works. **Example:** Higher-than-normal volume of similar complaints are anticipated to be received consecutively (same impact or same originating party) for a prolonged period (e.g. > 6 consecutive months).

#	Impact Category	Low Level of Impact	Medium Level of Impact	High Level of Impact
4.	**Noise**	The Noise and Vibration Risk Screening* does not indicate a risk that people or buildings in the vicinity of planned construction activities will be impacted by noise.	The Noise and Vibration Risk Screening* indicates a potential risk that people or buildings in the vicinity of planned construction activities will be impacted by noise, and the impact assessment conducted by an acoustical professional anticipates that the noise from the planned construction activities may have a medium impact.	The Noise and Vibration Risk Screening* indicates a potential risk that people or buildings in the vicinity of planned construction activities will be impacted by noise, and the impact assessment conducted by an acoustical professional anticipates that the noise from the planned construction activities may have a high impact.
5.	**Vibrations**	The Noise and Vibration Risk Screening* does not indicate a risk that people or buildings in the vicinity of planned construction activities will be impacted by vibration.	The Noise and Vibration Risk Screening* indicates a potential risk that people or buildings in the vicinity of planned construction activities will be impacted by vibration and the impact assessment conducted by an acoustical professional anticipates that the vibration from the planned construction activities may have a medium impact.	The Noise and Vibration Risk Screening* indicates a potential risk that people or buildings in the vicinity of planned construction activities will be impacted by vibration and the impact assessment conducted by an acoustical professional anticipates that the vibration from the planned construction activities may have a high impact.
6.	**Parking**	Minimal to no parking reduction where there is high parking demand (for construction site or in vicinity of construction site for staff).	Moderate levels of parking reduction where there is high parking demand (for construction site or in vicinity of construction site for staff) are anticipated with some alternatives available.	Major levels of parking reduction where there is high parking demand (for construction site or vicinity of construction site for staff) are anticipated with limited alternatives available.
7.	**Disruption in access to bike/pedestrian trails and routes**	Minimal to no incremental levels of access disruption or duration of disruption are anticipated as a result of planned works. **Example:** Small percentage (or less) of impacted bike trail(s)/route(s) are closed off to cyclists, and a range of alternate solutions could be accommodated.	Moderate level of access disruption or duration of disruption are anticipated as a result of planned works. **Example:** Some bike trail(s)/ route(s) with normally high traffic are closed off to cyclists for short periods but there are some options for detours.	Major level of access disruption or duration of disruption are anticipated as a result of planned works. **Example:** Substantial percentage of impacted bike trail(s)/route(s) are closed off to cyclists entirely and few options exist for detours or alternate arrangements.

*The Noise and Vibration Risk Screening is contained in the Metro Vancouver Construction Noise and Vibration Guide and is completed at the beginning of a utility capital project by the project team.

#	Impact Category	Low Level of Impact	Medium Level of Impact	High Level of Impact
8.	**Disruption to special events operations**	Limited to no incremental disruptions to known special events operations (e.g., parade, annual festival) as a result of planned works are anticipated. **Example:** The number or magnitude of special events impacted is low or municipal revenues generated via special events may decrease, though average total impacts are marginal.	Moderate disruptions to known special events operations (e.g., parade, annual festival) as a result of planned works are anticipated. **Example:** The number or magnitude of special events impacted is moderate or municipal revenues generated via special events may decrease.	Substantial disruptions to known special events operations (e.g., parade, annual festival) as a result of planned works are anticipated. **Example:** The number or magnitude of special events impacted is substantial and municipal revenues generated via special events are anticipated to materially decrease.
9.	**Assessment of and protection against impacts on existing non-Metro Vancouver utilities and roadway infrastructure**	Limited to no net impacts on member jurisdiction(s) utilities and roadway infrastructure are anticipated as a result of planned works. **Example:** No, or minor, modifications are needed to protect existing utilities serving member jurisdiction(s) and minimal disruption to non-Metro Vancouver utility services is anticipated.	Moderate impacts on member jurisdiction(s) utilities and roadway infrastructure are anticipated as a result of planned works. **Example:** Some work is required to protect existing non-Metro Vancouver utilities serving member jurisdiction(s) and minor disruption in non-Metro Vancouver services is anticipated.	Substantial impacts on member jurisdiction(s) utilities and roadway infrastructure are anticipated as a result of planned works. **Example:** Major work is required to protect or relocate existing non-Metro Vancouver utilities serving member jurisdiction(s). Material disruption in non-Metro Vancouver services is anticipated.
10.	**Temporary or permanent statutory rights of way**	Land required for temporary or permanent right of way already designated for utility or public use and unlikely to encumber needs for other utility or public use.	Land required for temporary or permanent right of way already designated for utility or public use but could encumber needs for other utility or public use.	Land required for temporary or permanent right of way is on investment property (i.e., lands that can be sold to third parties for development) or municipal development lands for future development (e.g., physical buildings such as community centres if directly affected by the presence of a right of way).
11.	**Official Community Plan (OCP) form and character**	Limited to no deviations from planned design and character of the impacted area as a result of and at completion of planned works anticipated. **Example:** Planned design of the project will result in limited to no change or deviation from character for the site as outlined in the OCP for that area.	Moderate deviations from planned design and character of the impacted area as a result of or at completion of planned works anticipated. **Example:** Planned design of the project will result in moderate character change or deviation for the site as outlined in the OCP for that area.	Substantial deviations from planned design and character of the impacted area as a result of and at completion of planned works anticipated. **Example:** Planned design of the project will result in substantial character change or deviation for the site as outlined in the OCP for that area.

#	Impact Category	Low Level of Impact	Medium Level of Impact	High Level of Impact
12.	**Existing community amenities**	Limited or no net change to access or availability of community amenities (e.g. ., park bench, water fountain, community art, playground, etc.) As a result of planned works anticipated. **Example:** A small number of community amenities are inaccessible, and alternative amenities are available.	Moderate net change to access or availability of community amenities (e.g., park bench, water fountain, community art, playground, etc.) As a result of planned works anticipated. **Example:** Some community amenities with high use/ visitation are inaccessible for brief periods of time, but there are some alternative amenities available.	Major net change to access and availability of community amenities (e.g., park bench, water fountain, community art, playground, etc.) As a result of planned works anticipated. **Example:** Permanent removal of high use/visitation amenities and long term (>6 months) lack of access with minimal alternatives available.
13.	**Permit application processing**	Minimal/limited staff capacity or technical expertise required for member jurisdiction(s) to process permit applications for planned works. **Example:** The permit application is not anticipated to require specialized expertise or training to review.	Moderate staff capacity or technical expertise required for the member jurisdiction(s) to process permit applications for planned works. **Example:** The permit application may require specialized expertise or training to review.	Substantial staff capacity and technical expertise required for the member jurisdiction(s) to process permit applications for planned works. **Example:** The permit application is anticipated to require substantial staff capacity and specialized expertise and training to review.
14.	**Site ecological disturbance**	Minimal/limited ecological disturbance anticipated with the planned works.	Moderate/material ecological disturbance anticipated with the planned works.	Substantial ecological disturbance anticipated with the planned work.

Appendix C – Mitigation Library

The Mitigation Library guides the identification of mitigation solutions for construction-related impacts.

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
1.	**Access disruption to businesses and residential properties**	Mitigation measures seek to better understand and provide advance notice of access disruptions to businesses and residential properties within the impacted area. **Example:** • Providing ample notice to businesses and residents about upcoming construction projects, including details about the duration, scope, and potential traffic impacts. • Requiring a public impact plan prepared by Metro Vancouver – including traffic, noise, air quality, preservation of existing utilities, site cleanliness, restoration. • Providing advance notice to affected neighbourhoods in the form of letters or dedicated webpage. • Conduct pre- and post-construction condition assessments on affected properties and make repairs as needed.	Mitigation measures seek to implement temporary measures which offset or provide alternative access options to businesses and residential properties within the impacted area. **Example:** In addition to the potential low intensity mitigation solutions, examples can include: • Implementing temporary access during construction such as bridges or pedestrian walkways to ensure continuous access to businesses and residences, including maintaining accessibility. • Conduct studies to understand rerouting options and implement mitigations which prioritize highest-impact/most vulnerable populations. • Coordinate with public transit agencies to reduce impacts on bus routes or relocate bus stops. • Coordinate with emergency services to ensure access and alternate routes are feasible. • Coordinate with waste and recycling collectors to ensure continued service. • Moderate adjustments to project schedule. • Moderate change to standard work hours/days.	Mitigation measures require major changes to standard or typical construction schedule and methodology, requiring additional costs and management oversight. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Utilize alternate construction methodology. • Changing project alignment or site location after Project Definition phase. • Alternate material delivery/ removal methods (e.g., barging, re-use) in order to reduce traffic impacts. • Substantial change to standard work hours/days. • Making substantial adjustments to project schedule.

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
2.	**Traffic congestion impacting businesses and residents**	Mitigation measures seek to provide advance notice and generate public awareness of upcoming traffic congestion. **Example:** • Providing ample notice to businesses and residents about upcoming construction projects, including details about the duration, scope, and potential traffic impacts. • Enhancing reference checks when awarding construction contracts. • Requiring contractors to attend public meetings. • Engaging with member jurisdiction(s) in development and review of traffic management strategies.	Mitigation measures seek to implement temporary relief measures to reduce dust or odour impacts, or establish more responsive, ongoing dialogue to understand and resolve impacts of dust or odour. **Example:** In addition to the potential low intensity mitigation solutions, examples can include: • Liaising with member jurisdiction(s) and other utilities to minimize collective impacts in the area. • Temporary works to facilitate traffic movement, such as intersection modifications, signal changes, enhanced intersection control. • Conduct studies to understand rerouting options and implement mitigations which prioritize highest-impact/most vulnerable populations. • Coordinate with public transit agencies to reduce impacts on bus routes or relocate bus stops. • Moderate adjustments to project schedule. • Moderate changes to standard work hours/days.	Mitigation measures seek to provide advance notice and generates public awareness of upcoming traffic congestion. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Utilize alternate construction methodology. • Changing project alignment or site location after Project Definition phase. • Use alternative material delivery/removal options (e.g., barging). • Substantial changes to standard work hours/days (e.g., to avoid peak traffic, expedite construction, etc.). • Substantial adjustments to project schedule.

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
3.	**Dust or odour**	Mitigation measures seek to avoid/reduce impacts or to provide greater notice and public awareness of upcoming dust/odour nuisances. **Example:** • Providing ample notice to businesses and residents about upcoming construction projects, including details about the duration, scope, and potential impacts. • Incentivizing construction methods which reduce or minimize dust and odour. • Regular cleaning of construction equipment, vehicles, and work areas to prevent the buildup of dust and odours and minimize their dispersion off-site. • Conducting baseline and continuing dust and odour studies throughout construction.	Mitigation measures seek to implement temporary relief measures to reduce dust or odour impacts, or establish more responsive, ongoing dialogue to understand and resolve impacts. **Example:** In addition to the potential low intensity mitigation solutions, examples can include: • Applying dust control products such as water or other dust suppressants, or biodegradable soil stabilizers, on exposed soil surfaces to prevent dust generation. • Regular street sweeping. • Locating dust or odour generating construction equipment (e.g., diesel generators) as far as practical from nearby residents and businesses. • Moderate change to standard work hours/days.	Mitigation measures require major changes to standard or typical construction schedule and methodology, requiring additional costs and management oversight. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Substantial change to standard work hours/days. • Utilize alternate construction methodology. • Revise project schedule to avoid dry season for dust producing activities.

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
4.	**Noise**	Mitigation measures seek to avoid/reduce impacts or to provide greater advanced notice and public awareness of upcoming noise nuisances. **Example:** • Providing ample notice to businesses and residents about upcoming construction projects, including details about the duration, scope, and potential noise impacts. • Conducting baseline and continuing noise studies throughout construction. • Specifying noise limits during construction.	Mitigation measures seek to implement temporary relief measures to reduce noise impacts, or establish more responsive, ongoing dialogue to understand and resolve impacts of noise. **Example:** In addition to the potential low intensity mitigation solutions, examples can include: • Non-standard construction methods during periods of peak activity. • Installing soundproofing materials on construction equipment, machinery or structures to reduce noise emissions (e.g., noise blankets, dampening panels, hush kits, mufflers, or enclosures). • Selecting low noise equipment (e.g., hospital grade diesel generators, or white noise back-up signals). • Locating noise generating equipment as far as practical from businesses and residents. • Installing noise monitoring equipment at sensitive locations to continuously monitor during construction. • Moderate change to standard work hours/days.	Mitigation measures require major changes to standard or typical construction schedule and methodology, requiring additional costs and management oversight. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Utilizing alternate construction methodology or site design which would substantially reduce or eliminate noise-related nuisances. • Moving larger construction zones (e.g., chambers) away from residents as much as possible. • Installing sound barriers during construction. • Substantial change to standard work hours/days. • Opting for alternative construction materials that produce less noise during installation and construction activities. (e.g., prefabricated materials, such as steel or concrete panels are often installed with less noise compared to traditional methods like pouring concrete on-site). • Changing project alignment or site location after Project Definition phase.

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
5.	**Vibrations**	Mitigation measures seek to avoid/reduce impacts or to provide greater advanced notice and public awareness of upcoming vibration occurrences. **Example:** • Providing ample notice to businesses and residents about upcoming construction projects, including details about the duration, scope, and potential vibration impacts. • Looking at alignment/ equipment placement to reduce proximity to businesses/residents. • Specifying vibration limits during construction. • Establishing buffer zones between construction sites and sensitive structures to mitigate the effects of vibrations. • Conduct baseline studies and regular monitoring and reporting during construction.	Mitigation measures seek to implement temporary relief measures to reduce vibration impacts, or establish more responsive, ongoing dialogue to understand and resolve impacts of vibrations. **Example:** In addition to the potential low intensity mitigation solutions, examples can include: • Installing isolation measures such as dampening materials or isolators between machinery and the ground to minimize vibration transmission. • Installing monitoring equipment at sensitive locations to continuously monitor vibration levels during construction activities. • Installing vibration reduction materials on construction equipment, machinery and structures to reduce vibration (e.g., vibration isolation mounts).	Mitigation measures require major changes to standard or typical construction schedule and methodology, requiring additional costs and management oversight. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Using alternative construction techniques such as precast elements or off-site construction where possible to reduce on-site activities and associated vibrations. • Employing low-impact construction methods (e.g., hydraulic breakers instead of traditional methods like pneumatic breakers, or vibratory rather than impact piling). • Changing project alignment or site location after Project Definition phase.

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
6.	**Parking**	Mitigation measures seek to avoid/reduce impacts or to provide greater notice and public awareness of upcoming parking disruptions and alternate solutions. **Example:** • Reviewing contractor parking plan with member jurisdiction(s) early in project planning. • Consider parking requirements during route alignment or site selection.	Mitigation measures seek to implement temporary relief measures to reduce or provide alternate solutions for business/resident parking during peak construction periods. **Example:** In addition to the potential low intensity mitigation solutions, examples can include: • Reducing contractor parking requirements. • Making contractor vehicles more visible for monitoring (e.g., requiring contractor to clearly identify vehicles of work crews during construction period). • Set limits on public roadway use by contractor vehicles. • Securing short-term, temporary free parking alternates for designated businesses and residents during peak construction activities when the most contractors are expected to be onsite. • Request Highway Use Permit (or other agreement) from member jurisdiction to designate part of public roadway for construction vehicle parking. • Alternate shift scheduling for construction activities to minimize parking requirements during peak hours, and concentrate activity/onsite parking availability for contractors during off-peak hours.	Mitigation measures require changes or material adjustments to construction schedule, methodology, or location of work, requiring additional costs and management oversight. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Considering offsite parking and shuttle options. • Reducing peak parking by contractors by changing construction methodology, approach or scheduling of work. • Securing long-term free parking alternates for designated businesses and residents during construction period.

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
7.	**Disruption in access to bike/pedestrian trails and routes**	Mitigation measures seek to avoid/reduce impacts and to provide advance notice and generate public awareness of upcoming disruption to bike/ pedestrian trails and routes. **Example:** • Identify, map, and communicate affected areas, the duration, and alternative routes to the public. • Installing temporary signage along affected trails to notify users of the construction and redirect them to alternative routes or detours.	Mitigation measures provide and signal users to detour options, and act as temporary relief for impacted bike/ pedestrian trails and routes. These mitigation measures may not be of complete comparable capacity and function as to the bike/ pedestrian trail or route experiencing disruption. **Example:** In addition to the potential low intensity mitigation solutions, examples can include: • Maintain reduced-traffic bike/pedestrian trails or routes during construction and ensure safety of cyclists is actively managed. Ensure the original trail/route is restored or improved after construction. • Creating temporary bike/ pedestrian trails or routes to offset those closed during construction, and ensuring the original trail or route is restored or improved after construction.	Mitigation measures replace bike/ pedestrian trails or routes made inaccessible during construction. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Creating new permanent bike/pedestrian trails or routes within close proximity of those closed for duration of construction; these routes will continue to be available after construction. • Changing project alignment after Project Definition phase.

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
8.	**Disruption to special events operations**	Mitigation measures will seek to better coordinate activities between Metro Vancouver project team and member jurisdiction(s), or to provide ample active notice to affected vendors and the public. **Example:** • Providing timely and clear communication to the member jurisdiction(s) about upcoming construction activities, including the duration, affected areas, and alternative routes. • Implementing traffic management plans to mitigate congestion caused by construction-related closures or detours. • Coordinating with member jurisdiction(s) to manage traffic flow and ensure smooth access to the event venue.	Mitigation measures may continue to accommodate special event operations in the member jurisdiction(s), though some reduction of event scale or programming is to be expected. **Example:** In addition to the potential low intensity mitigation solutions, examples can include: • Designating multiple entry and exit points to the venue to accommodate any access restrictions. • Scheduling work which may temporarily free up or delay works at particular sites allowing event to still proceed but with some restrictions/reduced programming. • Ask for temporary alternate options to host special event operations using Metro Vancouver's existing portfolio without substantial incremental investments to ready the site.	Mitigation measures will allow special event operations to continue with limited disruptions, by securing alternate sites or working with the member jurisdiction(s) to deliver the event through other means. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Metro Vancouver to explore and fund opportunities to co-host events with member jurisdiction(s) virtually. • Changing project alignment or site location after Project Definition phase. • Work with member jurisdiction(s) to identify alternate location/routing for event while site is unavailable. • Revise project schedule or stop work temporarily to accommodate the event.

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
9.	**Assessment of and protection against impacts on existing non-Metro Vancouver utilities and roadway infrastructure**	Mitigation measures seek to provide ample notice to business and residents affected during construction, and enhances coordination between contractor, member jurisdiction(s) and Metro Vancouver project team. **Example:** In addition to restoration guidance for roadways outlined in Metro Vancouver's Pavement Restoration Policy, examples can include: • Engaging with utilities and BC 1 Call early in the planning process to understand the location and specifications of existing infrastructure to consider in design and show on drawings as required. • Require use of advanced mapping technologies like GIS (Geographic Information Systems) to create accurate records of underground and above-ground utilities. • Minimal offset required (e.g., no other utilities or plans for new infrastructure) from existing infrastructure to new infrastructure to reduce proximity and mitigation measures required. • Providing ample notice to residents and businesses of upcoming utility disruptions.	Mitigation measures include temporary protection methods and monitoring, and early detailed planning to avoid and minimize disruptions or damage to non-Metro Vancouver utilities and roadway infrastructure. **Example:** In addition to the potential low intensity mitigation solutions, examples can include: • Implementing safe excavation practices to avoid accidental damage to underground utilities (e.g., techniques like hand digging or vacuum excavation in sensitive areas where utilities are present). • Providing temporary physical supports or rerouting for utility services during construction to maintain uninterrupted service to customers and neighbouring properties. • Obtaining necessary easements or right-of-way permissions from utility owners to protect their infrastructure. • Installing protective barriers or warning signage to prevent accidental damage to utility infrastructure. • Using methods like utility markers, barricades, or temporary fencing to define construction zones. • Requiring substantial offsets from existing to new infrastructure to reduce proximity and mitigation measures required. • Pre-excavate utilities to confirm location.	Mitigation measures require changes to project alignment and location, seeks to eliminate any non-Metro Vancouver utilities and roadway infrastructure disruptions, or will enhance the state of utility protection for member jurisdiction(s) after construction. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Providing alternate or temporary utility supply during periods of disruption. • Changing project alignment or site location after Project Definition phase.

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
10.	**Temporary or permanent statutory rights of way** Note: Metro Vancouver will not pay for land rights for member-owned public lands which will be returned to the same general use following the project's completion and will not pay land rental costs for rights of way.	Mitigation measures seek to minimize and restore impact areas. **Example:** • Address damage caused by the construction and restoration of disturbed areas. • Conducting thorough surveys of the statutory right of way and surrounding areas to identify potential risks, sensitive features, and existing infrastructure. • Existing replaced Metro Vancouver infrastructure abandoned in place.	Mitigation measures seek to address and/or compensate member for loss of use of area due to project activities. **Example:** In addition to the potential low intensity mitigation solutions, examples can include addressing: • Damage caused by the construction. • Restoration of disturbed areas. • Loss of revenue during construction (e.g., parking fees). • Relocation costs (permanent or temporary). • Loss of use during construction. • Removal of replaced Metro Vancouver infrastructure.	Mitigation measures seek changes to project alignment, location, or construction methods or payment for acquisition for permanent rights of way. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Changes to project alignment, siting, or construction methodology after Project Definition phase to minimize area of statutory rights-of-way but not to be considered as compensation for acquisition of temporary or permanent rights-of-way. • Provision of multi-use pathways, property enhancements, or landscaping improvements, where deemed reasonable in the overall context of the project, but not considered as compensation for acquisition of temporary or permanent rights-of-way. • For permanent rights-of-way, Metro Vancouver to pay member jurisdiction(s) fair market value acquisition costs for investment properties (i.e., lands that can be sold to third parties for development) and municipal development lands designated for future use (e.g., physical buildings such as community centres if directly affected by the presence of a right-of-way).

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
11.	**Official Community Plan (OCP) form and character**	Mitigation measures to align with form and character requirements outlined in the OCP of the member jurisdiction(s) as part of initial site selection and planning discussions. **Example:** • Consider OCP in route alignment or site selection planning. • Accommodate minor changes (no net change to project cost or schedule) into project design to align with form and character of area as outlined in the OCP.	Mitigation measures will seek to limit or manage deviations from the form and character requirements outlined in the OCP of the member jurisdiction(s) for the selected site or alignment. **Example:** In addition to the potential low intensity mitigation solutions, examples can include: • Accommodating minor changes (minimal project cost or schedule implications) into project design to align with form and character of area. • Minor adjustment to route alignment or site selection.	Mitigation measures to limit deviations from form and character requirements outlined in the OCP of the member jurisdiction(s) involving changes to the design and site location. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Changing project alignment or site location after Project Definition phase. • Altering the proposed design of the facility or infrastructure building(s) to align with form and character requirements within the OCP (e.g., building features such as a green roof, interpretive elements, higher end finishes, or project site features such as paths, tennis courts).
12.	**Existing community amenities** Note: Metro Vancouver will consider provision of net new community amenities in lieu of impact mitigation on a case-by-case basis.	Mitigation measures seek to provide advance notice and generate public awareness of upcoming amenity disruption. **Example:** • Identify, map, and communicate affected areas, the duration, and alternative amenity locations to the public.	Mitigation measures provide and signal users to alternative amenities. These mitigation measures may not be of comparable capacity and function. **Example:** • Providing maps to similar amenities. • Enhanced communication with the public on where and how to access alternative amenities. • Installing temporary signage to notify users of the construction and redirect them to alternative amenities.	Mitigation measures seek to maintain a similar experience of amenity in a temporary or alternate location. **Example:** • Creating a temporary amenity to offset those removed or made inaccessible during construction. • Ensuring the original amenity is restored after construction. • Providing a similar amenity in an alternate location. • Changing project alignment or site location after Project Definition phase.

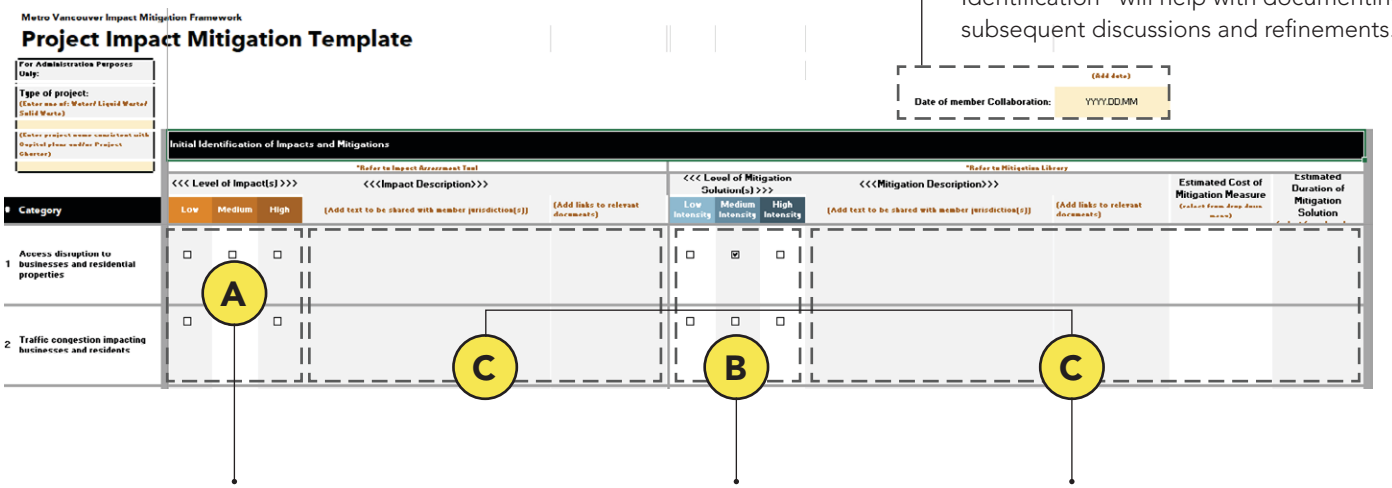
#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
13.	**Permit application processing**	Mitigation measures enable improved efficiency in permit review and processing. **Example:** • Providing a clearly defined process for contractors and sub-contractors to propose and receive approval for alternative solutions or plans (from both member jurisdiction(s) and Metro Vancouver). • Providing advance notice to member jurisdiction(s) of project timing and requirements to flag potential issues and plan around anticipated approval timelines. • Metro Vancouver staff to engage consultants to review permit applications to facilitate expedient review by member jurisdiction(s). • Hosting member jurisdiction(s) to share information about upcoming projects, establish approval requirements, and plan resource allocations based on anticipated demands.	Mitigation measures provide tools, processes, some staff capacity or technical expertise for member jurisdiction(s) to process permit applications for planned works in a timely manner. **Example:** In addition to the potential low intensity mitigation solutions, examples can include: • Establishing overarching permits for Metro Vancouver capital projects, structural projects, and linear projects respectively. • Negotiating a permitting exemption agreement or an annual operating fee between Metro Vancouver and member jurisdiction(s).	Mitigation measures address gap in substantial staff capacity or technical expertise required for member jurisdiction(s) to process permit applications for planned works in a timely manner. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Member jurisdiction(s) authorizing use of qualified professional(s) to certify building code and bylaw compliance of Metro Vancouver's permit application(s) at Metro Vancouver cost and thus foregoing permit fees to be charged by member jurisdiction(s) to Metro Vancouver (Refer to Chapter 26, Section 55 of the Community Charter and Section 743 of the Local Government Act.

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
14.	**Site ecological disturbance**	Mitigation measures encourage identification of opportunities which could reduce ecological disturbance of planned works. **Example:** • Establishing evaluation methodologies for innovative solutions that minimize or reduce ecological degradation. • Working with member jurisdiction(s) to minimize loss of trees, and environmental degradation resulting from construction. • Re-vegetation plans. • Environmental monitoring, erosion, and sediment control measures.	Mitigation measures seek to identify and provide some offsets for ecological disturbance from planned works or improve ecological condition greater than current state of an impacted area. **Example:** In addition to the potential low intensity mitigation solutions, examples can include: • Habitat restoration projects along the project alignment or site location.	Mitigation measures change construction approach and methodology to reduce ecological disturbance of planned works. **Example:** In addition to the potential moderate and low intensity mitigation solutions, examples can include: • Utilizing non-standard construction methodology to avoid tree removal, replanting, and environmental degradation. • Restoring degraded ecosystems or creating new habitats off-site from the project. • Changing project alignment or site location after the Project Definition phase.

Appendix D – Project Impact Mitigation Template

The template is a separate document where information can be entered based on the instructions below. The intent of this template is to capture all identified impacts and mitigations applied to a project.

Collaboration with members
Add the date of the collaboration period in the yellow cell to track ongoing collaboration with members. Grouped columns to the right of "Initial Identification" will help with documenting subsequent discussions and refinements.



Review the **Impact Assessment Tool** in **Appendix B** of the Guide. Under section Initial Identification of Impacts and Mitigations check Low, Medium, or High for the level of impact(s) determined for each Category.

#	Impact Category	Low Level of Impact	Medium Level of Impact	High Level of Impact
1.	Access disruption to businesses and residential properties	Minimal or limited access disruption to businesses or residential properties are anticipated as a result of the planned works. Example: Some businesses or residential properties may experience some impact to reduced access points. Access disruptions can be resolved with minimal detours or accommodations.	Moderate/notable access disruption to businesses or residential properties are anticipated as a result of the planned works. Example: A substantial number of businesses or residential properties in the impacted area are anticipated to experience some reduction in access points. Access disruptions can be resolved with reasonable detours (e.g., no substantive change to business operation plans).	Substantial access disruption to businesses or residential properties are anticipated as a result of the planned works. Example: The majority of businesses and residential properties in the impacted area are anticipated to experience substantially less access via previous access points. Only available resolutions include major detours or accommodations (e.g., changing access hours, mode of access,etc.).

Review the **Mitigation Library** in **Appendix C** of the Guide. Under section Initial Identification of Impacts and Mitigations check Low, Medium, or High for the level of mitigation solutions(s) determined for each Category.

#	Mitigation Category	Low Intensity Level of Mitigation Solution	Medium Intensity Level of Mitigation Solution	High Intensity Level of Mitigation Solution
1.	Access disruption to businesses and residential properties	Mitigation measures seek to better understand and provide advanced notice of access disruptions to businesses and residential properties within the impacted area. Example: • Providing ample notice to businesses and residents about upcoming construction projects, including details about the duration, scope, and	Mitigation measures seek to implement temporary measures which offset or provide alternative access options to businesses and residential properties within the impacted area. Example: In addition to the potential Low Intensity Mitigation Solutions, examples can include: • Implementing temporary access during construction such as bridges or	Mitigation measures require major changes to standard or typical construction schedule and methodology, requiring additional costs and management oversight. Example: In addition to the potential Moderate and Low Intensity Mitigation Solutions, examples can include: • Utilize alternate construction methodology. • Changing project alignment or site location after Project

Note: Each category includes examples of what a high, medium, and low intensity mitigation solution could look like to help determine the best solution for the impact identified in that category.

Establish the impact and mitigation solutions that will be used to inform the design and fill out the **Impact and Mitigation Description, Estimated Cost of Mitigation Measure,** and **Estimated Duration of Mitigation Solution** under the Initial Identification of Impacts and Mitigations section for each of the categories.

Collaborate with member jurisdictions on the level of impact and level of mitigation solutions determined, and confirm the impacts and solutions that have been established.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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Water Committee and Liquid Waste Committee

From: Jennifer Crosby, Director, Project Management Office, Project Delivery
Nermine Tawfik, Supervisor Community Engagement, External Relations

Date: June 21, 2023 Meeting Date: July 12, 2023
July 19, 2023

Subject: **Guide to Metro Vancouver Utility Capital Projects for Member Jurisdictions and Impact Mitigation Framework**

RECOMMENDATION

That the GVWD and GVS&DD Boards receive for information the report dated June 21, 2023 titled "Guide to Metro Vancouver Utility Capital Projects for Member Jurisdictions and Impact Mitigation Framework".

EXECUTIVE SUMMARY

Metro Vancouver currently mitigates and compensates member jurisdictions for the impact of projects taking place within their jurisdiction through various means, which are generally negotiated on a case-by-case basis. Mitigation and compensation for member jurisdictions may take the form of changes to a design resulting in higher project costs, addition of community amenities, upgrades to member's infrastructure, provision of resources to our members to handle increased workload resulting from our projects, as well as payment of fees for various permits, lost revenue, letters of credit, and other charges.

Metro Vancouver staff continue to work with member jurisdictions to review practices with a goal to create a predictable, consistent and equitable approach to mitigating and compensating member jurisdictions for the impacts to their community during construction of region-serving infrastructure. This report provides an update on this work, including publishing the *Guide to Metro Vancouver Utility Capital Projects for Member Jurisdictions.*

PURPOSE

To provide the GVWD and GVS&DD Boards an update on progress with developing an equitable impact mitigation framework for member jurisdictions in which Metro Vancouver is undertaking capital project construction, including publishing the *Guide to Metro Vancouver Utility Capital Projects for Member Jurisdictions* (Attachment 1).

BACKGROUND

Each year, Metro Vancouver delivers projects to ensure that the region has reliable access to clean drinking water, safe wastewater removal and treatment, and waste disposal and recycling. The purpose of delivering these services on behalf of the members is to provide infrastructure at a scale that is more efficient than if each member or participant delivered the services separately. As a result, the services offer efficiencies that benefit all members. Members participate in the core services based on the understanding that not only will the benefits of the service be equitably

shared amongst participants, but the impacts and costs of delivering those services are also equitably shared.

Over the years, members have raised concerns regarding impacts to their communities through noise, dust, and traffic disruption, as well as impacts to their staffing time and resources due to capital project construction. Currently, impacts and corresponding mitigation measures are negotiated on a case-by-case basis with the member jurisdiction within which the construction project is taking place. This has resulted in unequal levels of compensation and mitigation to our members as well as unpredictable material impacts to the scope, schedule, and budget of Metro Vancouver capital projects.

In 2018, the Metro Vancouver Board rescinded the existing Capital Projects Policy and recommended that Metro Vancouver staff work with advisory committees to develop a capital projects framework, which would capture the approach and process of how Metro Vancouver utility capital projects are planned, managed, and communicated. Since then, Metro Vancouver has been engaging with member jurisdictions through a Regional Engineers Advisory Committee (REAC) working group consisting of members from the City of Coquitlam, District of North Vancouver, and the cities of Surrey and Vancouver, along with Metro Vancouver staff. The group discussed many important topics and issues and made practical suggestions toward creating more equitable and consistent approaches to improve the processes and communication between our organizations.

The working group came to agreement on a number of improvements and also identified areas where consensus was not possible. Some of the improvement solutions related to stronger coordination and communication have been implemented through a process Metro Vancouver staff just piloted with the City of New Westminster and are now implementing with the City of Burnaby. Recommendations related to improved tendering and procurement are being implemented on current projects. The balance of recommended improvement solutions/ideas (where there was and was not consensus) will be progressed through development of two key deliverables, which are further discussed in the following sections.

Guide to Metro Vancouver Utility Capital Projects for Member Jurisdictions

A guide has been developed to describe the phases of most Metro Vancouver utility capital projects and provides a high-level, consistent, and transparent roadmap that will help member jurisdictions plan their involvement in a Metro Vancouver utility capital project. It identifies the key responsibilities and decision points for both Metro Vancouver and member jurisdiction staff throughout the project lifecycle (from initiation through to close out). The audience for the guide is Metro Vancouver and member jurisdictions staff involved with Metro Vancouver water, liquid waste, and solid waste utility capital projects. The guide describes current practices only, not desired or future state, Metro Vancouver, in collaboration with member jurisdictions, consultants, and contractors is actively and continuously improving these practices and the guide will be updated periodically to reflect changes.

The guide was shared with all REAC members at the Metro Vancouver Conference Day held on May 12, 2023. The document will be available to member jurisdictions staff through the Metro Vancouver website.

Impact Mitigation Framework

In a report to the GVWD and GVS&DD Boards at their October 28, 2022 meeting (Attachment 2), Metro Vancouver staff outlined some of the current issues related to mitigation and compensation practices for Metro Vancouver capital projects construction. Building upon the outcomes from the REAC working group, an impact mitigation framework will be developed to enable predictable, consistent, and equitable approaches to mitigating construction impacts to their communities during construction. This will allow Metro Vancouver to strengthen its relationships with member jurisdictions and the public. The specific objectives for this work include:

- Clarify expectations for how Metro Vancouver and member jurisdictions work together to deliver regional infrastructure
- Standardize the process for assessing and mitigating the impacts of utility capital projects on member jurisdictions
- Reduce risk and uncertainty related to the delivery of Metro Vancouver utility capital projects which in turn reduces impacts on costs and schedules

To support this, Metro Vancouver has outlined a three-part facilitated workshop series with all REAC members starting in 2023 as follows:

Workshop 1 **May 12, 2023 - COMPLETE**	**Workshop 2** **Target Q4 2023**	**Workshop 3** **TBD**
Purpose: Explore the impacts of Metro Vancouver capital projects construction on member jurisdictions	**Purpose**: Share Metro Vancouver's tools and approaches for identifying impacts and improving intergovernmental coordination Build a framework for mitigation practices (guiding principles, impact assessment tool, defining mitigation)	**Purpose**: Revise and finalize the framework for mitigation practices
Outcome: Establish a shared understanding of the impacts of capital projects construction	**Outcome**: Identify elements of an equitable framework	**Outcome**: Framework to be presented to RAAC and Metro Vancouver Boards

The workshop on May 12 was attended by 25 REAC and REAC Subcommittee members representing 17 out of 21 GVWD and GVS&DD members. Following a short contextual presentation, members participated in a facilitated discussion to identify the impacts of Metro Vancouver's capital project construction, from project initiation through to close-out, and discussed the magnitude and

complexity of these impacts. Participants shared their experiences and the group heard diverse perspectives from each member jurisdiction.

The workshops are intended to be an iterative process to inform the framework development. Metro Vancouver staff will integrate feedback from the workshops and prior discussions from the REAC working group into recommended guiding principles and approaches to different forms of mitigation to develop a predictable, equitable, and consistent regional approach. The proposed framework will go to REAC and Regional Administrators Advisory Committee (RAAC) prior to coming to the Water and Liquid Waste Committees and the GVWD and GVS&DD Boards for review and approval.

ALTERNATIVES
This is an information report. No alternatives are presented

FINANCIAL IMPLICATIONS
The development of standardized, region-wide approaches to mitigation and compensation for projects undertaken in member jurisdictions would help to manage project costs, maintain project schedules, mitigate scope creep and change orders on construction projects, as well as ensure a transparent and equitable approach across all member jurisdictions.

CONCLUSION
Metro Vancouver is committed to the continuous improvement of its processes and coordination with member jurisdictions to deliver regional capital projects efficiently and cost effectively, and to mitigate the impacts of these projects. Development of the *Guide to Metro Vancouver Utility Capital Projects for Member Jurisdictions* is now complete and has been shared with REAC at the Metro Vancouver Conference Day on May 12, 2023 as well as RAAC on June 22, 2023.

The first workshop on May 12, 2023 is one of a three-part workshop series with REAC to engage with members on the development of a framework for mitigation practices for member jurisdictions in which Metro Vancouver is undertaking capital project construction. Planning is underway to prepare for the second workshop, which is targeted to be held in Q4 2023.

~~**Attachments**~~
1. ~~Guide to Metro Vancouver Utility Capital Projects (59308623)~~
2. ~~Compensation Practices Related to Metro Vancouver's Delivery of Projects, report dated September 28, 2022 (53943312)~~
3. ~~Guide to Metro Vancouver Utility Capital Projects for Member Jurisdictions and Impact Mitigation Framework - Presentation~~

60662303

Attachment 4

MV Utility Capital Projects - Construction Impact Mitigation Framework

Jennifer Crosby, P. Eng.
Director - Project Management Office
Project Delivery Department

Brianne Zimmermann
Sr. Regulatory Analyst
Project Delivery Department

Water Committee Meeting – November 6, 2024

71310601

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OBJECTIVES

1. Provide progress update
2. Share feedback from MV Conference Day and REAC / RAAC Survey Responses
3. Discuss next steps

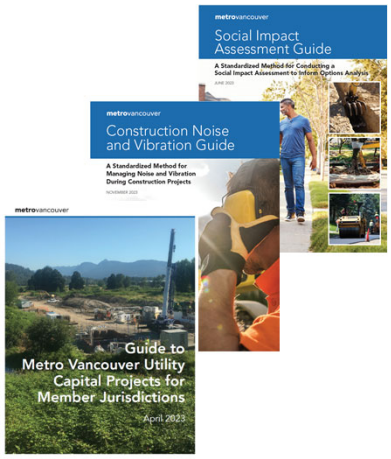

Tunnel Boring Machine and Loading System

MV CAPITAL PROJECT PLANNING AND DELIVERY

Improving coordination and communication during the planning and delivery of regional infrastructure projects in member jurisdictions

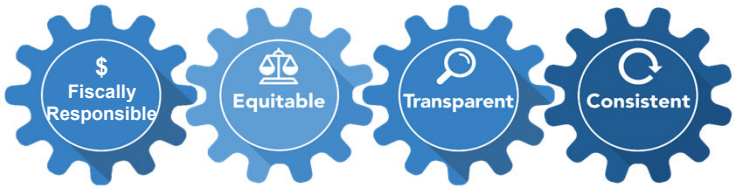
Completed works by MV:

- Utility Capital Projects Guide
- Project Coordination Reference Guide
- Noise and Vibration Guide
- Social Impact Assessment
- **Impact Mitigation Framework**



IMPACT MITIGATION FRAMEWORK

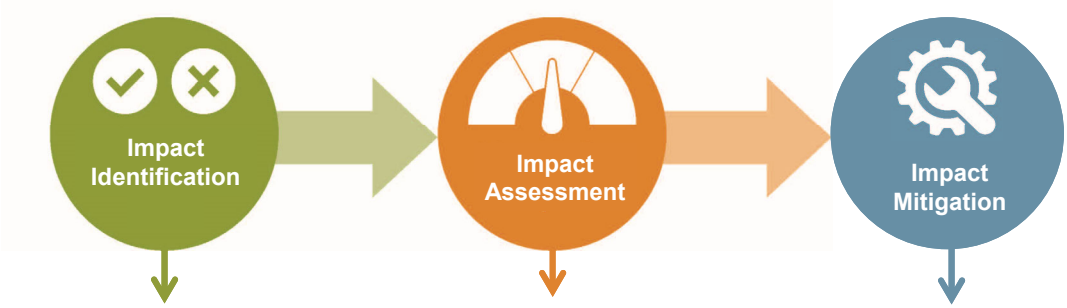
Guiding Principles & Project Objectives



- **Clarify expectations** for how Metro Vancouver and member jurisdictions work together to deliver regional infrastructure
- **Standardize the process** for assessing and mitigating the impacts of utility capital projects on member jurisdictions
- **Reduce risk and uncertainty** related to the delivery of Metro Vancouver utility capital projects which in turn reduces impacts on costs and schedules

IMPACT MITIGATION FRAMEWORK

High Level Process Overview



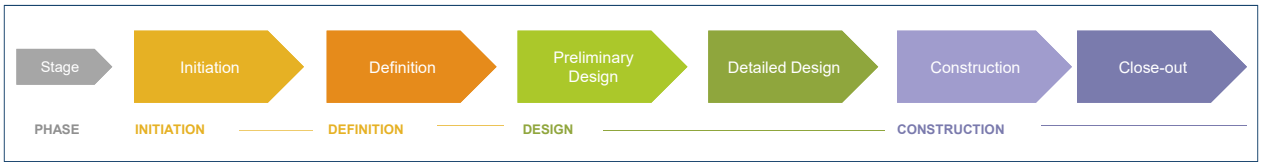
Identify the impacts of a utility capital project on member jurisdiction(s)

Determine the magnitude of the impact on member jurisdictions

Mitigate the impacts to member jurisdictions

HOW THE FRAMEWORK WILL BE USED

Applied iteratively over the project lifecycle with member jurisdiction involvement



With input from member jurisdictions, project teams assess social, environmental and financial considerations to **identify** recommended project approach, including site/alignment.

Construction Impact Mitigation Framework

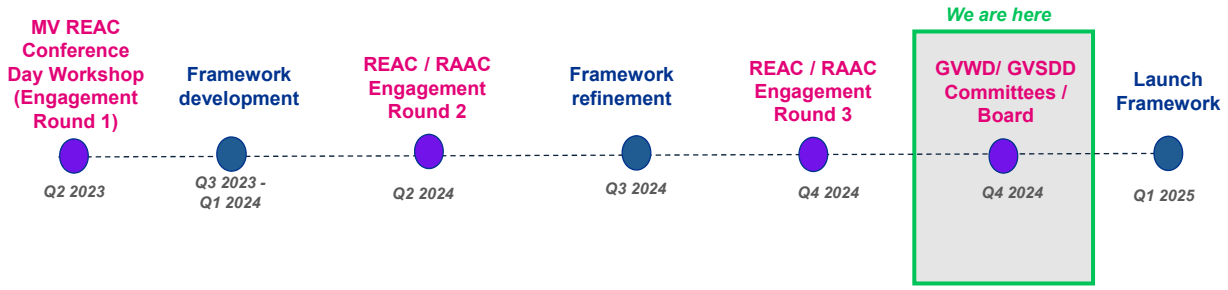
Project teams **confirm** anticipated construction impacts and mitigations in discussion with member jurisdictions and incorporate into construction contract.

Standardized templates used to **document** anticipated impacts and preferred options to avoid, minimize, or offset impacts.

Project teams **monitor** mitigation effectiveness and control quality measures in discussion with members.

Project impacts and mitigations are documented and used to **inform** future capital projects and refine framework.

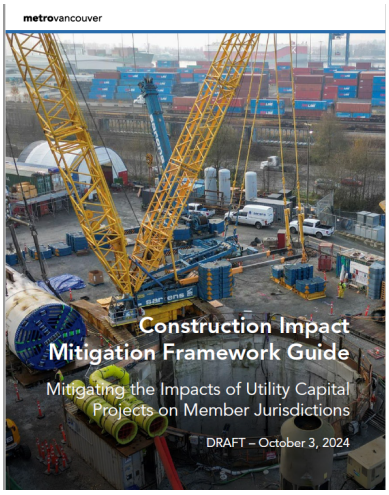
IMPACT MITIGATION FRAMEWORK WORK PLAN



IMPACT MITIGATION FRAMEWORK

Deliverables

1. Core Deliverables ✓
    a. Impact Assessment Tool
    b. Impact Mitigation Library
2. Supporting Deliverables ✓
    a. Framework Guide
    b. Framework Templates
    c. Utility Capital Projects - Permitting Fact Sheet



REAC & RAAC ROUND 2 & 3 ENGAGEMENT SUMMARY

- Presentation to REAC and RAAC – May 3; May 23
- Presentation & Open House at MV Conference Day – June 7
- Online Feedback Survey sent to REAC and RAAC (Open May 3 to June 14)
- Presentation to REAC and RAAC – October 4; Oct 15
  - ➢ Overall positive feedback including appreciation for the development of the framework.
  - ➢ Support for consistent approach and fiscal responsibility to mitigating impacts to all members.

MEMBER FEEDBACK: WHAT WE HEARD

Changes Made to Impact Assessment Tool & Mitigation Library

1. Clarified impacts to non-MV utilities to include roadway infrastructure including reference to MV Board Policy Pavement Restoration for Sewer and Water Main Installations
2. Expanded traffic mitigation examples to include intersection modification, signal changes, enhanced intersection control
3. Revised access mitigation examples to reference access for emergency services and waste/ recycling collection
4. Revised bike trail/routes impact category to include pedestrian trails/ routes

The **framework is expected to be refined over time** as projects are completed and mitigations are monitored and documented. This may include edits to the description of impacts and mitigation examples.

MEMBER FEEDBACK: WHAT WE HEARD

Language Incorporated into the Framework Guide

1. Framework enables expedited decision-making and nimble responses to adapting and refining mitigations.
2. The collective suite of impacts and mitigations for the given project is to be evaluated; not necessary for each impact and mitigation intensity to match within a project or between projects.
3. Each utility capital project has an MV point of contact assigned.
4. There is a collaborative process to avoid, minimize and mitigate construction impacts; in some cases this will result in a “build back better” approach.
5. Monitoring quality and effectiveness of the impact mitigation measures during construction and refining mitigation measures if initial plans are insufficient, or if there is a change in construction schedule or scope.
6. Early collaboration with member jurisdictions on MV utility capital projects is enabled through various MV and member jurisdiction activities throughout the project lifecycle.

MEMBER FEEDBACK: WHAT WE HEARD

Out of Scope of Framework or Addressed Elsewhere

Feedback	Response
Broaden scope to include impacts or opportunities related to municipal planned work such as streetscape and greenway projects	MV engages annually on the capital program with members at municipal coordination meetings which enables coordination of schedules. MV works with member jurisdictions to align restoration efforts with municipal plans for streetscapes and greenways. MV considers incorporation of Member jurisdiction requested and funded scope into MV utility capital projects through Coordinated Works Agreements where appropriate.
Assessing and managing cumulative impacts of multiple MV projects on a member jurisdiction	The framework is intended to support individual projects. Accounting for impacts across a portfolio of projects to a member jurisdiction is out of scope for this initial version of the Framework.
Provision of funding for facilitating, approving and monitoring member permitting processes	Permit fees are intended to cover these costs. Members have the option to delegate BC Building Code oversight to a qualified professional. In the Guide to the framework, it is noted that for large projects, custom agreements can be developed to formalize submission requirements, approvals, fees, timelines and resource commitments.

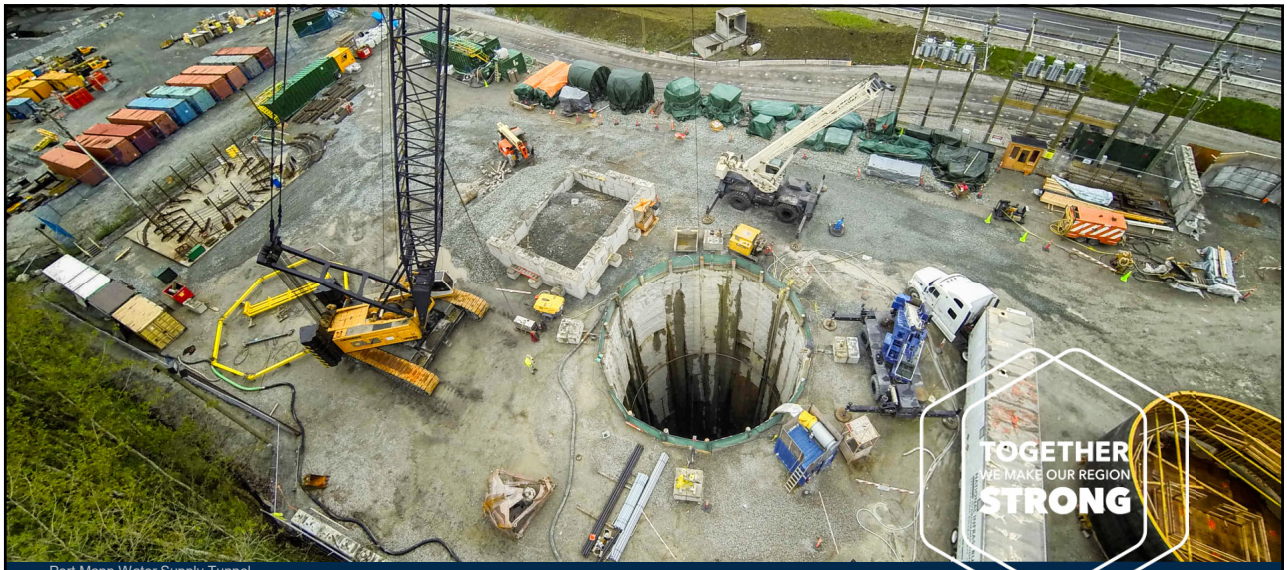
MEMBER FEEDBACK: WHAT WE HEARD (CONT'D)

Out of Scope of Framework or Addressed Elsewhere

Feedback	Response
Consistent, transparent and equitable approach for quantifying land use impacts **Concerns related to compensation for hosting infrastructure on land not designated for profitable development e.g. parkland** **Concerns for the unfair burden of hosting multiple MV infrastructure projects**	MV is considering establishing principles for assessing above-ground loss of use methodology. Currently, compensation may be payable if the land in question is investment land or if they are required for future municipal development lands. If compensation is payable, Metro Vancouver will compensate member jurisdictions for acquisition of land rights following the guiding principles of consistency, equity, transparency, and fiscal responsibility. In cases where Metro Vancouver requires land rights from members for a project, the tax payer should not be expected to pay for those lands which are already in the public realm, and where lands will be returned to the same general use following the project's completion.
Weighting criteria for the impact categories	The framework is intended to be a tool to enable collaboration between MV and Members. Due to the variability in impacts felt by members for each project scope and location, no weighting criteria has been included at this time.
Compensation in lieu of mitigations(s) or transferring responsibility for impact mitigation (e.g. site restoration) to member jurisdictions	MV is responsible for mitigating construction impacts due to utility capital projects. Requests for compensation in lieu of mitigations(s) will be handled on a case-by-case basis.

KEY TAKEAWAYS

1. Framework developed with input from RAAC, REAC and MV staff
2. Overall positive feedback received with some opportunities for future continuous improvement
3. Next Steps:
    1. Nov 2024 – Present Framework to GVS&DD and GVWD Committees and Boards
    2. Q1 2025 – Framework launched to MV and Member Staff



Port Mann Water Supply Tunnel

Thank you

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MV Utility Capital Projects - Construction Impact Mitigation Framework

Jennifer Crosby, P. Eng.
Director - Project Management Office
Project Delivery Department

Brianne Zimmermann
Sr. Regulatory Analyst
Project Delivery Department

Water Committee Meeting – November 6, 2024

71310601

metrovancouver

1

OBJECTIVES

1. Provide progress update
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Tunnel Boring Machine and Loading System

2

MV CAPITAL PROJECT PLANNING AND DELIVERY

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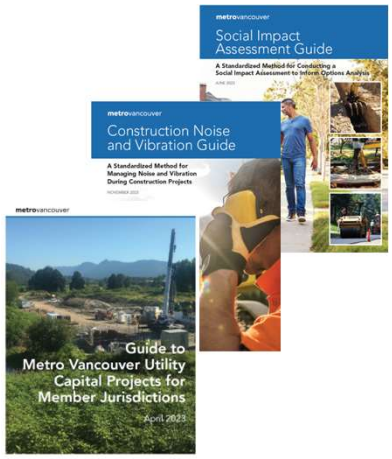

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IMPACT MITIGATION FRAMEWORK

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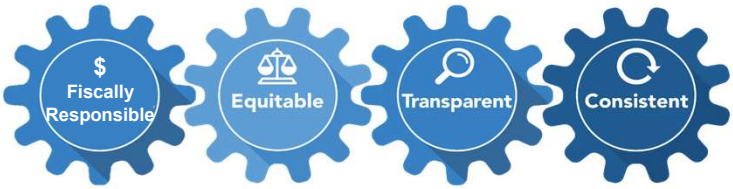

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IMPACT MITIGATION FRAMEWORK

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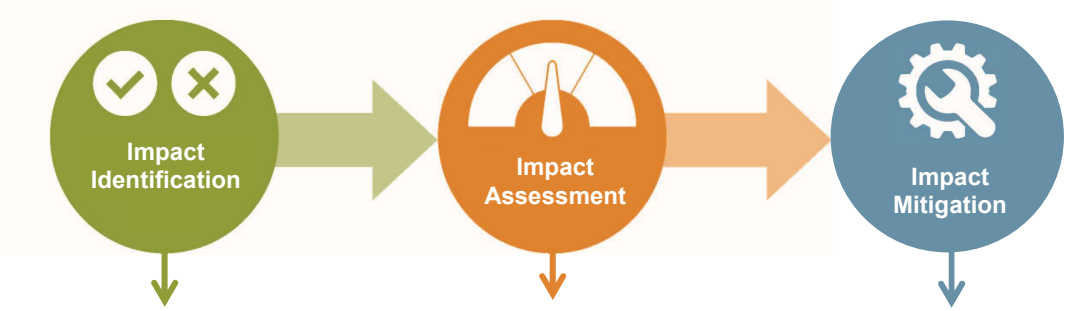

Identify the impacts of a utility capital project on member jurisdiction(s)

Determine the magnitude of the impact on member jurisdictions

Mitigate the impacts to member jurisdictions

5

HOW THE FRAMEWORK WILL BE USED

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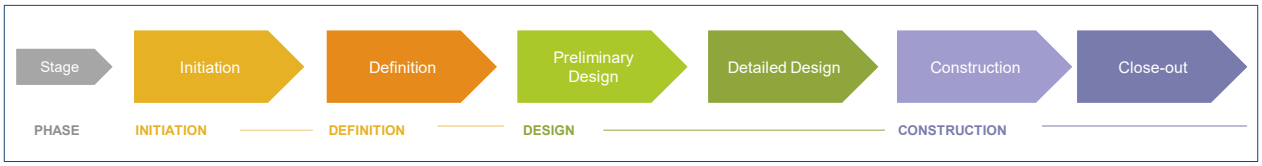

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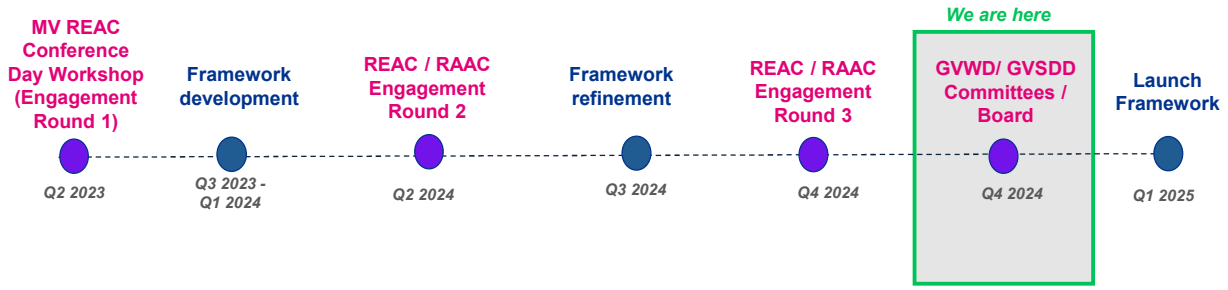

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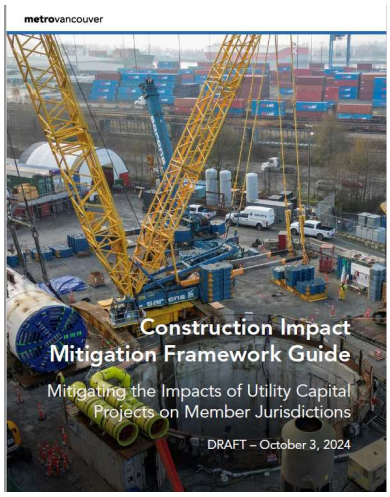

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11

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MEMBER FEEDBACK: WHAT WE HEARD (CONT'D)

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Port Mann Water Supply Tunnel

Thank you

metrovancouver

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Attachment 2

MV Utility Capital Projects - Construction Impact Mitigation Framework

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Liquid Waste Committee Meeting – November 13, 2024

71436793

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OBJECTIVES

1. Provide progress update
2. Share feedback from MV Conference Day and REAC / RAAC Survey Responses
3. Discuss next steps


Tunnel Boring Machine and Loading System

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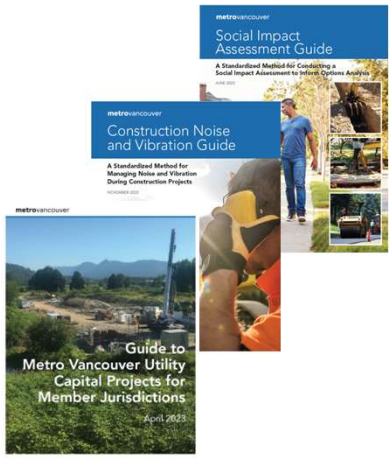
MV CAPITAL PROJECT PLANNING AND DELIVERY

Improving coordination and communication during the planning and delivery of regional infrastructure projects in member jurisdictions

Completed works by MV:

- Utility Capital Projects Guide
- Project Coordination Reference Guide
- Noise and Vibration Guide
- Social Impact Assessment
- **Impact Mitigation Framework**



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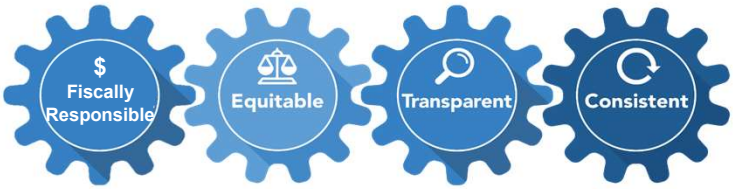
IMPACT MITIGATION FRAMEWORK

Guiding Principles & Project Objectives



- **Clarify expectations** for how Metro Vancouver and member jurisdictions work together to deliver regional infrastructure
- **Standardize the process** for assessing and mitigating the impacts of utility capital projects on member jurisdictions
- **Reduce risk and uncertainty** related to the delivery of Metro Vancouver utility capital projects which in turn reduces impacts on costs and schedules

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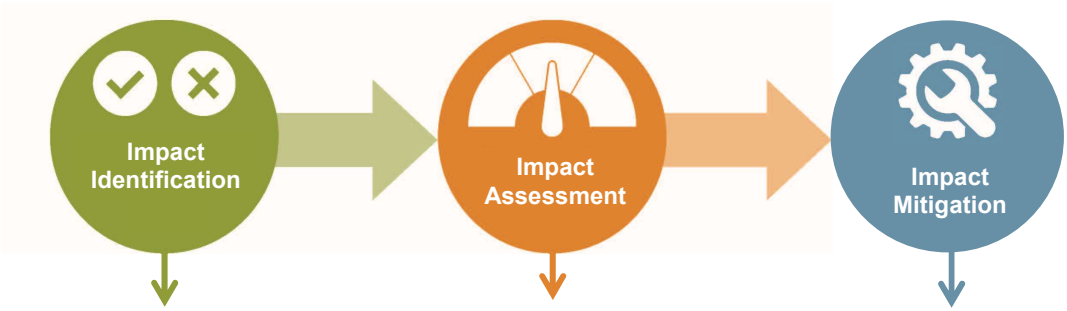
IMPACT MITIGATION FRAMEWORK

High Level Process Overview



Identify the impacts of a utility capital project on member jurisdiction(s)

Determine the magnitude of the impact on member jurisdictions

Mitigate the impacts to member jurisdictions

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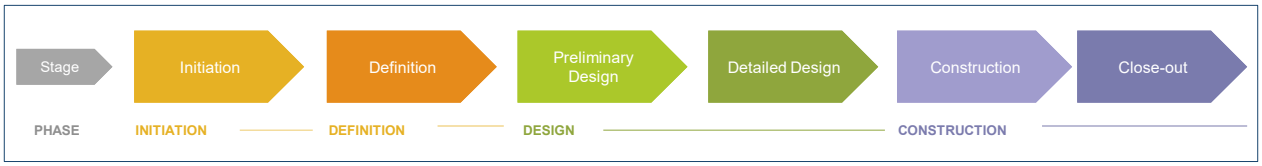
HOW THE FRAMEWORK WILL BE USED

Applied iteratively over the project lifecycle with member jurisdiction involvement



With input from member jurisdictions, project teams assess social, environmental and financial considerations to **identify** recommended project approach, including site/alignment.

Construction Impact Mitigation Framework

Project teams **confirm** anticipated construction impacts and mitigations in discussion with member jurisdictions and incorporate into construction contract.

Standardized templates used to **document** anticipated impacts and preferred options to avoid, minimize, or offset impacts.

Project teams **monitor** mitigation effectiveness and control quality measures in discussion with members.

Project impacts and mitigations are documented and used to **inform** future capital projects and refine framework.

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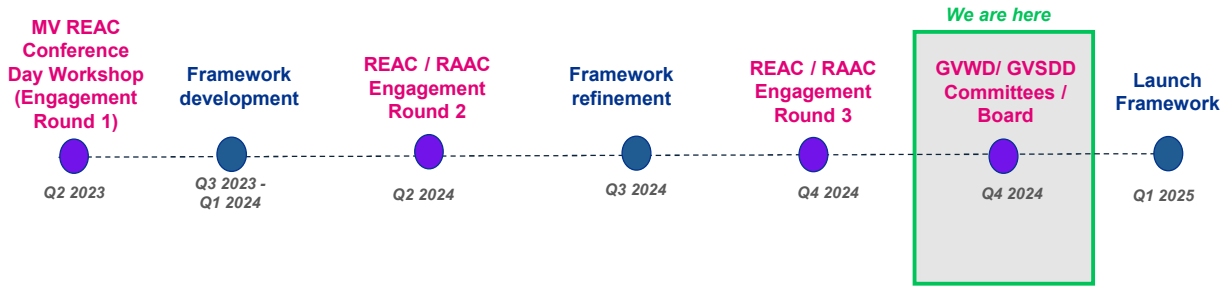
IMPACT MITIGATION FRAMEWORK WORK PLAN



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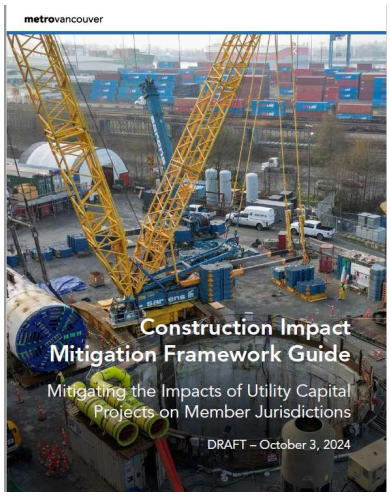
IMPACT MITIGATION FRAMEWORK

Deliverables

1. Core Deliverables ✓
   a. Impact Assessment Tool
   b. Impact Mitigation Library
2. Supporting Deliverables ✓
   a. Framework Guide
   b. Framework Templates
   c. Utility Capital Projects - Permitting Fact Sheet



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REAC & RAAC ROUND 2 & 3 ENGAGEMENT SUMMARY

- Presentation to REAC and RAAC – May 3; May 23
- Presentation & Open House at MV Conference Day – June 7
- Online Feedback Survey sent to REAC and RAAC (Open May 3 to June 14)
- Presentation to REAC and RAAC – October 4; Oct 15
  - ➢ Overall positive feedback including appreciation for the development of the framework.
  - ➢ Support for consistent approach and fiscal responsibility to mitigating impacts to all members.

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MEMBER FEEDBACK: WHAT WE HEARD

Changes Made to Impact Assessment Tool & Mitigation Library

1. Clarified impacts to non-MV utilities to include roadway infrastructure including reference to MV Board Policy Pavement Restoration for Sewer and Water Main Installations
2. Expanded traffic mitigation examples to include intersection modification, signal changes, enhanced intersection control
3. Revised access mitigation examples to reference access for emergency services and waste/ recycling collection
4. Revised bike trail/routes impact category to include pedestrian trails/ routes

The **framework is expected to be refined over time** as projects are completed and mitigations are monitored and documented. This may include edits to the description of impacts and mitigation examples.

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MEMBER FEEDBACK: WHAT WE HEARD

Language Incorporated into the Framework Guide

1. Framework enables expedited decision-making and nimble responses to adapting and refining mitigations.
2. The collective suite of impacts and mitigations for the given project is to be evaluated; not necessary for each impact and mitigation intensity to match within a project or between projects.
3. Each utility capital project has an MV point of contact assigned.
4. There is a collaborative process to avoid, minimize and mitigate construction impacts; in some cases this will result in a “build back better” approach.
5. Monitoring quality and effectiveness of the impact mitigation measures during construction and refining mitigation measures if initial plans are insufficient, or if there is a change in construction schedule or scope.
6. Early collaboration with member jurisdictions on MV utility capital projects is enabled through various MV and member jurisdiction activities throughout the project lifecycle.

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MEMBER FEEDBACK: WHAT WE HEARD

Out of Scope of Framework or Addressed Elsewhere

Feedback	Response
Broaden scope to include impacts or opportunities related to municipal planned work such as streetscape and greenway projects	MV engages annually on the capital program with members at municipal coordination meetings which enables coordination of schedules. MV works with member jurisdictions to align restoration efforts with municipal plans for streetscapes and greenways. MV considers incorporation of Member jurisdiction requested and funded scope into MV utility capital projects through Coordinated Works Agreements where appropriate.
Assessing and managing cumulative impacts of multiple MV projects on a member jurisdiction	The framework is intended to support individual projects. Accounting for impacts across a portfolio of projects to a member jurisdiction is out of scope for this initial version of the Framework.
Provision of funding for facilitating, approving and monitoring member permitting processes	Permit fees are intended to cover these costs. Members have the option to delegate BC Building Code oversight to a qualified professional. In the Guide to the framework, it is noted that for large projects, custom agreements can be developed to formalize submission requirements, approvals, fees, timelines and resource commitments.

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MEMBER FEEDBACK: WHAT WE HEARD (CONT'D)

Out of Scope of Framework or Addressed Elsewhere

Feedback	Response
Consistent, transparent and equitable approach for quantifying land use impacts **Concerns related to compensation for hosting infrastructure on land not designated for profitable development e.g. parkland** **Concerns for the unfair burden of hosting multiple MV infrastructure projects**	MV is considering establishing principles for assessing above-ground loss of use methodology. Currently, compensation may be payable if the land in question is investment land or if they are required for future municipal development lands. If compensation is payable, Metro Vancouver will compensate member jurisdictions for acquisition of land rights following the guiding principles of consistency, equity, transparency, and fiscal responsibility. In cases where Metro Vancouver requires land rights from members for a project, the tax payer should not be expected to pay for those lands which are already in the public realm, and where lands will be returned to the same general use following the project's completion.
Weighting criteria for the impact categories	The framework is intended to be a tool to enable collaboration between MV and Members. Due to the variability in impacts felt by members for each project scope and location, no weighting criteria has been included at this time.
Compensation in lieu of mitigations(s) or transferring responsibility for impact mitigation (e.g. site restoration) to member jurisdictions	MV is responsible for mitigating construction impacts due to utility capital projects. Requests for compensation in lieu of mitigations(s) will be handled on a case-by-case basis.

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KEY TAKEAWAYS

1. Framework developed with input from RAAC, REAC and MV staff
2. Overall positive feedback received with some opportunities for future continuous improvement
3. Next Steps:
    1. Nov 2024 – Present Framework to GVS&DD and GVWD Committees and Boards
    2. Q1 2025 – Framework launched to MV and Member Staff

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Port Mann Water Supply Tunnel

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To: GVS&DD Board of Directors

From: Peter Navratil, General Manager, Liquid Waste Services

Date: November 15, 2024 Meeting Date: November 29, 2024

Subject: **Authorization of a Contract Amendment to 19-112 Utility Residuals Management Hauling Services**

LIQUID WASTE COMMITTEE RECOMMENDATION

That the GVS&DD Board approve the amendment of contract 19-112 Utility Residuals Management Hauling Services to include the following greenhouse gas emissions mitigation item:

a) switch from current fossil fuel-based diesel to renewable diesel in the residuals hauling fleet at a cost of up to $1,701,000 (exclusive of taxes) over the five-year term, subject to final review by the Commissioner; and

b) authorize the Commissioner to execute the required documentation once the Commissioner is satisfied that the award should proceed.

At its November 13, 2024 meeting, the Liquid Waste Committee considered the attached report titled "Authorization of a Contract Amendment to 19-112 Utility Residuals Management Hauling Services", dated November 5, 2024. The Committee passed resolutions a) and c) from the report. The recommendation before the Board for approval is presented above in underline style.

Recommendation b) was referred to staff. This matter is now before the Board for its consideration.

ATTACHMENTS

1. "Authorization of a Contract Amendment to 19-112 Utility Residuals Management Hauling Services", dated, November 5, 2024.

72108262

To: Liquid Waste Committee

From: Janelle Hunt, Program Manager, Utility Residuals Management, Liquid Waste Services

Date: November 5, 2024 Meeting Date: November 13, 2024

Subject: **Authorization of a Contract Amendment to 19-112 Utility Residuals Management Hauling Services**

RECOMMENDATION

That the GVS&DD Board approve the amendment of contract 19-112 Utility Residuals Management Hauling Services to include the following greenhouse gas emissions mitigation items:

a) switch from current fossil fuel-based diesel to renewable diesel in the residuals hauling fleet at a cost of up to $1,701,000 (exclusive of taxes) over the five-year term, subject to final review by the Commissioner; and
b) trial a hydrogen fuel cell electric vehicle in the residuals hauling fleet at a cost of up to $3,915,000 (exclusive of taxes) over the five-year term, subject to final review by the Commissioner; and
c) authorize the Commissioner to execute the required documentation once the Commissioner is satisfied that the award should proceed.

EXECUTIVE SUMMARY

Liquid Waste Services is proposing to amend contract 19-112 Utility Residuals Management Hauling Services to incorporate the use of greenhouse gas (GHG) emission reduction measures associated with the residuals hauling fleet. These measures include replacing traditional fossil fuel-based diesel with renewable diesel and initiating a trial of a hydrogen fuel cell electric vehicle (HFCEV) for long-distance hauling. The additional cost of incorporating these GHG emission reduction measures is $5,616,000 over five years, with a projected reduction of 11,210 tonnes of CO_2e. The next five-year extension term of the hauling contract is valued at $75.6 million; amending the contract to add these two options represents an additional 7.4% increase to the cost of residuals hauling. Emissions reduction measures have been included in the 2025-2029 plan and there are sufficient funds in the operating budget to accommodate this cost. Implementing these emission reduction measures will better align Metro Vancouver's residuals management program with Metro Vancouver's Climate 2050 strategy.

PURPOSE

To receive GVS&DD Board approval to amend the Utility Residuals Management Hauling Services contract to include new GHG reduction opportunities.

BACKGROUND

Liquid Waste Services' Utility Residuals Management program is responsible for managing the transportation of residuals generated at Metro Vancouver's wastewater and drinking water treatment plants. In October 2019, the GVS&DD Board approved the award of a contract in the amount of up to $77,845,000 (exclusive of taxes) to Arrow Transportation Systems Inc. (Arrow),

resulting from Request for Proposal No. 19-112 Utility Residuals Management Hauling Services and authorized Metro Vancouver to execute a five-year contract with the option to extend for another five years. In October 2024, the existing contract was extended for an additional four years plus an option to extend for one additional year per the terms of contract 19-112 and in accordance with Metro Vancouver's Procurement and Asset Disposal Authority Policy FN-031. The current 10-year contract value is $153,461,000.

Under the contact, Arrow provides transportation services for biosolids from Metro Vancouver's wastewater treatment plants and drinking water treatment residuals from the Seymour Capilano filtration plant to various sites in southwestern British Columbia and western Alberta. Arrow has provided reliable hauling services for Metro Vancouver's residuals for nearly 30 years and is committed to sustainability, innovation and continuous improvement.

Long-distance hauling of residuals to beneficial use sites plays a significant and important role in the residuals management program. It is also a significant contributor to the overall GHG production of Metro Vancouver. As Liquid Waste Services will continue to rely on long-distance hauling of residuals, incorporating emission reduction measures will be imperative for Metro Vancouver to reach its climate action goals.

METRO VANCOUVER CLIMATE 2050 & HAULING EMISSIONS

Metro Vancouver recognizes the need for transformative action in addressing climate change and has committed to corporate carbon neutrality by 2050. The Board endorsed Climate 2050 Transportation Roadmap identifies numerous strategies for working towards carbon neutral transportation, including the reduction of heavy truck emissions and supporting early adoption of zero emission heavy trucks (strategy 3). Implementing these strategies into residuals hauling will not only have a meaningful impact on Metro Vancouver's GHG production, it will also solidify our commitment to achieving our climate action goals.

Hauling Emission Reduction Options

Negotiations with Arrow identified three emission reduction measures that can be incorporated into the existing contract to reduce the emissions associated with residuals hauling. These include:

a) Renewable Diesel – Created using bio-feedstocks such as canola, tallow and tall oil, renewable diesel offers over 80% reduction in carbon emissions compared to fossil fuel diesel by lowering the carbon intensity of transportation fuels. While there is a premium cost over the use of traditional diesel, renewable diesel use can be implemented with minimal operational changes and offers a significant GHG reduction opportunity.

b) Hydrogen Fuel Cell Electric Vehicles (HFCEV) – HFCEV are a newly emerging technology in zero emission vehicles. The benefits of HFCEV include increased payload capacity and increased travel distance capabilities when compared to battery electric vehicles. Further, Metro Vancouver is exploring the potential of capturing nuisance ammonia from wastewater treatment plants to produce green hydrogen. This would provide the opportunity to fuel the vehicles that are hauling our residuals. Arrow has been selected to trial one of five HFCEV in the province as part of a industry leading pilot project to

demonstrate the viability of hydrogen-powered heavy-duty trucks in reducing GHG emissions.

c) Battery Electric Vehicles (BEV) – BEVs, a zero emission vehicle technology, are powered by electricity and require charging infrastructure readily available within the vehicle's hauling range. BEVs in transport trucks are becoming increasingly popular as the availability infrastructure improves. Their use is generally limited to local hauling at a reduced payload. Local hauling represents approximately 10% of the residuals management program.

All these measures align with the *Climate 2050* Transportation Roadmap, specifically through the early adoption of zero emission vehicle technology to drive innovation and by reducing the carbon intensity of transportation fuels. At this time, the use of renewable diesel and trialing a hydrogen fuel cell truck are the most viable options for reducing GHG associated with residuals hauling given the distance and payload limitations of electric battery vehicles.

ALTERNATIVES

1. That the GVS&DD Board approve the amendment of contract 19-112 Utility Residuals Management Hauling Services to include the following greenhouse gas emissions reduction cost items:
   a) switch from current fossil fuel-based diesel to renewable diesel in the residuals hauling fleet at a cost of up to $1,701,000 (exclusive of taxes) over the five-year term, subject to final review by the Commissioner; and
   b) trial a hydrogen fuel cell electric vehicle in the residuals hauling fleet at a cost of up to $3,915,000 (exclusive of taxes) over the five-year term, subject to final review by the Commissioner; and
   c) authorize the Commissioner to execute the required documentation once the Commissioner is satisfied that the award should proceed.

2. That the GVS&DD Board approve the amendment of contract 19-112 Utility Residuals Management Hauling Services to include the following greenhouse gas emissions reduction cost items:
   a) switch from current fossil fuel-based diesel to renewable diesel in the residuals hauling fleet at a cost of up to $1,701,000 (exclusive of taxes) over the five-year term, subject to final review by the Commissioner; and
   b) trial a hydrogen fuel cell electric vehicle in the residuals hauling fleet at a cost of up to $3,915,000 (exclusive of taxes) over a five-year term, subject to final review by the Commissioner; and
   c) incorporate a battery electric vehicle into the residuals hauling fleet at a cost of up to $2,935,000 (exclusive of taxes) over a five-year term, subject to final review by the Commissioner; and
   d) authorize the Commissioner to execute the required documentation once the Commissioner is satisfied that the award should proceed.

3. That the Liquid Waste Committee receive for information the report dated November 5, 2024, titled "Authorization of a Contract Amendment to 19-112 Utility Residuals Management Hauling Services".

FINANCIAL IMPLICATIONS

Metro Vancouver's *Carbon Price Policy* No. GV-015 states that Metro Vancouver will use a total Carbon Price of $150 per tonne of CO_2e in Life Cycle Cost Analyses. Testing and piloting new technologies now allows Metro Vancouver to be on the leading edge of emissions reduction in the region, demonstrating our commitment and leadership in this area. Investing in industry leading technology, such as HFCEVs and BEVs, at the onset comes at a premium cost (approximately $4,700 per tonne of CO_2e) which is expected to diminish as the technology matures. Evaluation of pilot projects should not rely on the Carbon Price, as the fundamental objective of pilot projects is to test the feasibility and scalability of technologies that support strategic priorities. Renewable diesel (approximately $70 per tonne of CO_2e), however, is considered a proven alternative fuel appropriate to evaluate against the Carbon Price. The cost of renewable diesel may decrease with time as fuel supply increases.

The costs associated with incorporating emission reduction measures into contract 19-112 Utility Residuals Management Hauling Services as presented in Alternatives 1 and 2 are presented in the table below along with the estimated reduction in GHG's for each. The cost presented in Alternatives 1 and 2 are considered package prices. Should the Board choose to amend the contract to include only one emission reduction measure, the price of that measure will increase, as shown under the individual options in Table 1 below. By packaging renewable diesel with a HFCEV the cost of the renewable diesel decreases as less hauling will be completed with renewable diesel.

Table 1: Contract amendment financial summary for 19-112 including GHG emissions summary

	Individual Options			Package Cost	
	Renewable Diesel	HFCEV	BEV	**Alternative 1** Renewable Diesel + HFCEV	**Alternative 2** Renewable Diesel + HFCEV + BEV
Total tonnes of CO_2e reduced	11,010	850	630	11,210	11,360
% of total hauling CO_2e reduced	65%*	5%	4%	66%*	67%*
Total cost	$1,759,000	$3,915,000	$2,954,000	$5,616,000	$8,551,000

*Note: As the availability of renewable diesel fueling infrastructure increases, the % CO_2e reduced will increase.

The costs associated with either alternative are accounted for within the Liquid Waste Services Utility Residuals Management program operating budget.

CONCLUSION

It is recommended that the GVS&DD Board authorize the amendment of contract 19-112 Utility Residuals Management Hauling Services, in the amount of up to $5,616,000 (exclusive of taxes), to incorporate the use of renewable diesel and trial a HFCEV in the existing contract with Arrow Transportation Services Inc. This amendment will enable Metro Vancouver to take meaningful steps

towards honoring its commitments to reducing greenhouse gas emissions and driving sustainable innovation as outlined in the *Climate 2050* strategy.

ATTACHMENT

1. Authorization of a Contract Amendment to 19-112 Utility Residuals Management Hauling Services Presentation

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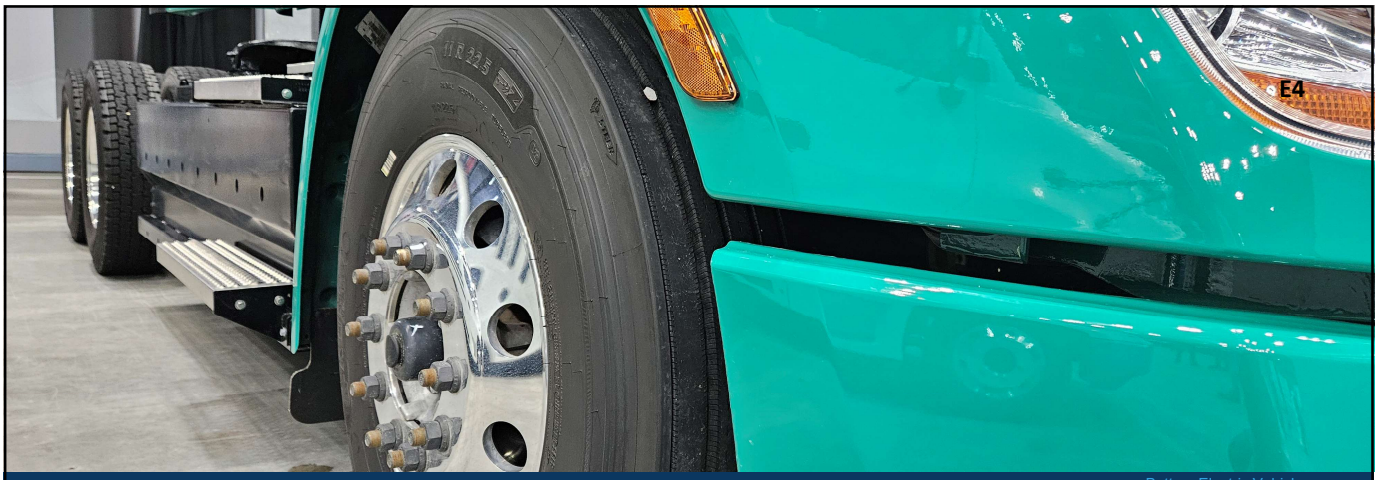
Attachment 1



Battery Electric Vehicle

Authorization of a Contract Amendment

19-112 UTILITY RESIDUALS MANAGEMENT HAULING SERVICES

Janelle Hunt
Program Manager, Utility Residuals Management

Liquid Waste Committee – November 13, 2024
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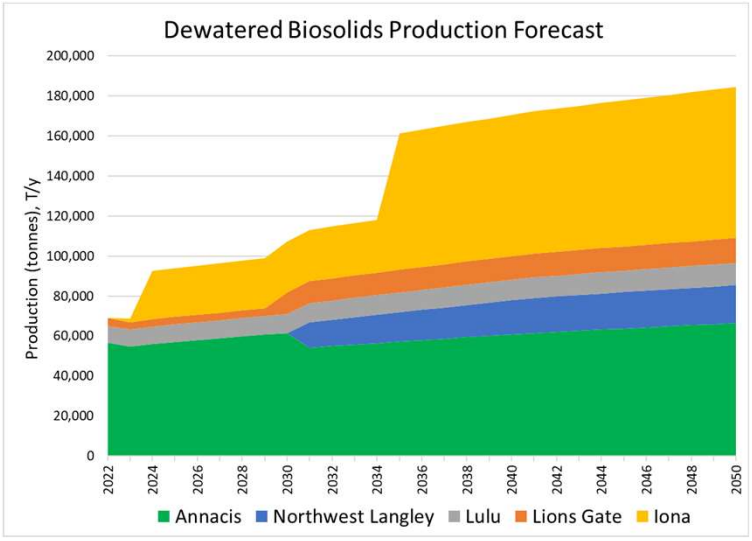
RESIDUALS HAULING

Requirements and emissions

- LWS largest source of energy-based emissions
- Biosolids production will more than double within next 15 years
- Climate 2050 goals include carbon neutrality



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GHG REDUCTION

Opportunities

Three options identified:

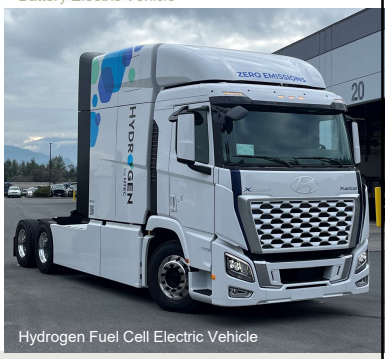
Operational Scale

1. Renewable Diesel

Pilot Scale

2. Hydrogen Fuel Cell Electric Vehicle
3. Battery Electric Vehicle

Battery Electric Vehicle



Hydrogen Fuel Cell Electric Vehicle

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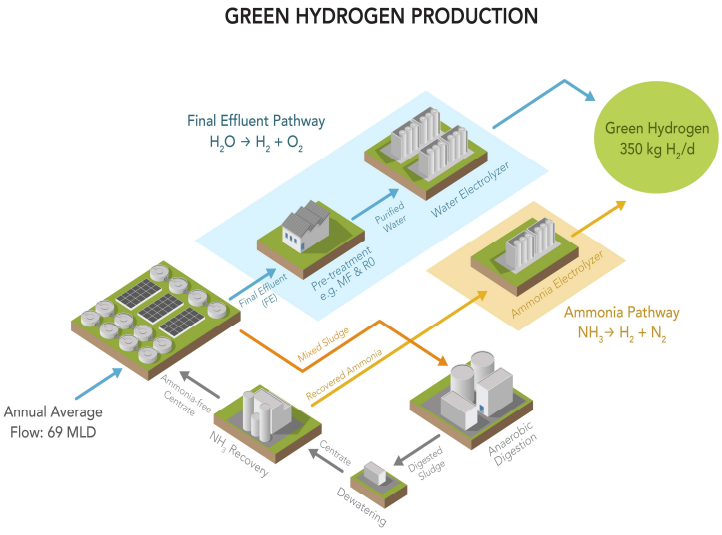
INTERCONNECTED GOALS

Lulu Island WWTP Hydrogen Pilot

- Nuisance ammonia capture for conversion to Hydrogen
- Export hydrogen as low carbon fuel
- Potential at LIWWTP for 128 tonnes of Hydrogen per year
- 2025 Workplan: Initiate preliminary design; selection of Hydrogen Production Unit; develop hydrogen off-take agreements



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RECOMMENDATION AND ALTERNATIVE

Costs and emissions reduction

	Individual Options			Package Cost	
	Renewable Diesel	HFCEV	BEV	Alternative 1 Renewable Diesel + HFCEV	Alternative 2 Renewable Diesel + HFCEV + BEV
Total tonnes of CO_2e reduced	11,010	850	630	11,210	11,360
% of total hauling CO_2e reduced	65%	5%	4%	66%	67%
Total cost	$1,759,000	$3,915,000	$2,954,000	$5,616,000*	$8,551,000

*Alternative 1 represents a premium of 7.4% on the total 5-year hauling contract value

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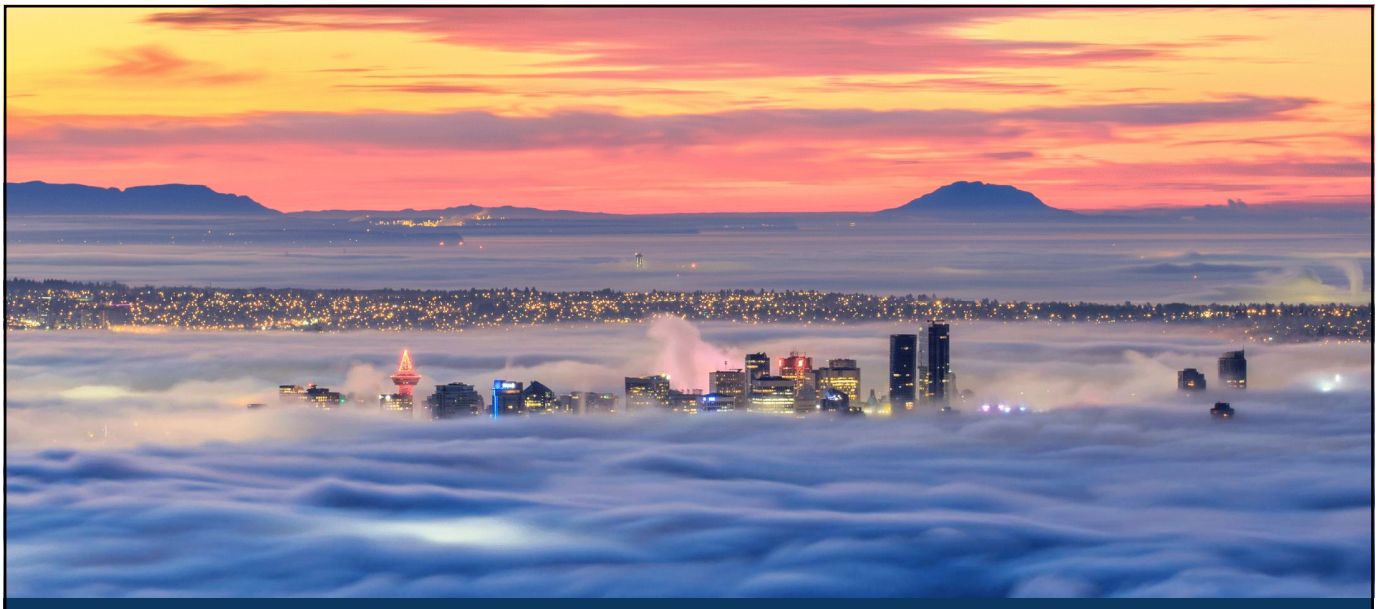

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: GVS&DD Board of Directors

From: Peter Navratil, General Manager, Liquid Waste Services

Date: November 14, 2024 Meeting Date: November 29, 2024

Subject: **Seeking Federal Support for the Development of a Flushability Standard**

RECOMMENDATION
That the GVS&DD Board direct staff to submit the following resolution to Federation of Canadian Municipalities:

FLUSHABILITY STANDARD DEVELOPMENT

WHEREAS, in March 2023, FCM called on the federal government for a moratorium on the "flushable" designation in Canada until an appropriate standard is created to ensure the veracity and validity of the potential for degradation in sewers in order to eradicate the impact of “flushable wipes” and similar products on wastewater infrastructure; and

WHEREAS, responses from the federal government to date describe limitations of creating future legislation or regulations without a standard definition of “flushability”; and

WHEREAS, the development of a Canada-wide standard for “flushability” would serve a critical role in defining what constitutes a flushable product and could be referenced in future legislation or regulations; therefore be it

RESOLVED, That FCM urge the federal government to support the development of a flushability standard through a Standards Council of Canada-accredited standards development organization; and be it further

RESOLVED, That FCM requests that the federal government funds and mandates that an appropriate coordinating body be formed to manage the development of a flushability standard through a Standards Council of Canada-accredited standards development organization to be completed within 5 years.

BACKGROUND
At its November 13, 2024 meeting, the Liquid Waste Committee considered the attached report titled “Seeking Federal Support for the Development of a Flushability Standard”, dated November 6, 2024. In response to the committee supporting the following resolution:

> *That the GVS&DD Board support Metro Vancouver to submit a resolution to request federal support for the development of a flushability standard to the Federation of Canadian Municipalities.*

Staff are to bring to the GVS&DD Board the resolution to be submitted to the Federation of Canadian Municipalities (FCM) for formal board approval. The approval of the actual resolution is a formal requirement of the FCM resolution process.

This matter is now before the Board for its consideration.

ATTACHMENT

1. "Seeking Federal Support for the Development of a Flushability Standard", dated, November 6, 2024.

72124389

To: Liquid Waste Committee

From: Dana Zheng, Program Manager, Policy Planning and Analysis, Liquid Waste Services

Date: November 6, 2024 Meeting Date: November 13, 2024

Subject: **Seeking Federal Support for the Development of a Flushability Standard**

RECOMMENDATION

That the GVS&DD Board support Metro Vancouver to submit a resolution to request federal support for the development of a flushability standard to the Federation of Canadian Municipalities.

EXECUTIVE SUMMARY

Municipal wastewater systems have experienced significant issues with non-biodegradable wipes being labelled and advertised as “flushable” wipes. Due to product mislabeling and consumer misinformation, “flushable” wipes have had compromising effects on sewer infrastructure, resulting in equipment damage, clogs, and sewer overflows. These issues have led to avoidable and costly expenditures. Currently, there is no recognized standard for what can be defined as “flushable” and as a result, no regulations on what commercial product manufacturers can label as “flushable”. Metro Vancouver is working to address this challenge by seeking federal support for the development of a Canada-wide recognizable flushability standard through an accredited standards development organization by submitting a resolution to the Federation of Canadian Municipalities (FCM).

PURPOSE

To seek Board support for Metro Vancouver’s submission of a resolution to FCM regarding federal support for the development of a flushability standard through an accredited standards development organization.

BACKGROUND

Metro Vancouver is a member of FCM and has the opportunity to submit a resolution on emerging policy issues that are the direct responsibility or concern of Canadian municipalities at a national level and fall within the jurisdiction of the federal government. FCM requires a board resolution indicating support to be considered. Resolutions must be received by the appropriate deadline for consideration at FCM's Board meetings or the Annual Conference, and the deadline for resolutions submitted to the March Board meeting is the second Monday of January.

Impacts of Flushable Wipes and Other Disposable Projects

The flushing of disposable wipes and other products labelled as “flushable” causes serious and costly issues for wastewater utilities because they do not break down in the wastewater system. Instead, they can clog sewers and damage pumping equipment, increasing operations costs and contributing to overflows into homes and the environment. Canadian municipalities spend an estimated $250 million every year to deal with the impacts of so-called flushable products

(Reference 1). Metro Vancouver and its members spend over $2 million every year to address ongoing issues from wipes and other items in its wastewater system.

Efforts to Date for Increased Regulations

Metro Vancouver has used annual public education campaigns to change residents' flushing habits with the Unflushables Campaign. While this campaign has successfully influenced public behaviours towards better flushing practices, the overarching issue is improper product labelling. Until there is a regulated labelling standard for the term "flushable" that truly reflects the impacts of these products on the wastewater systems, this remains an issue that has been created by the private sector and downloaded onto the public sector to resolve.

Metro Vancouver staff are participating on the Canadian Water and Wastewater Association (CWWA) Flushables Committee and are working to implement product labelling standards for flushability across Canada. Municipalities and public utilities across Canada, along with environmental advocacy groups, have been working since the 2010s to advocate for federal regulations on flushable wipes. This includes a 2019 grievance with the Competition Bureau, a 2020 Union of British Columbia Municipalities (UBCM) resolution (Reference 2), and a 2023 FCM resolution to ban "flushable" claims on disposable wipes (Reference 3). However, responses from the federal government to date have pointed to limitations within the *Competition Act* and *Consumer Packaging and Labelling Act* that prevent their ability to ban the term "flushable" without a recognizable definition of flushability.

CREATION OF A CANADIAN FLUSHABILITY STANDARD AND BENEFITS

To date, two sets of flushability guidelines have been created in an attempt to align industry practices and the needs of municipal wastewater treatment systems. In 2008, the representatives of flushable products manufacturers, Association of the Nonwoven Fabrics Industry (INDA) and European Disposable and Nonwovens Association, jointly released flushability guidelines for the testing and labeling of products that were to be marketed as flushable. These voluntary INDA guidelines, currently in their fourth edition, are developed exclusively by industry associations. The INDA guidelines are inadequate, as they allow for the inclusion of strong synthetic fibres that do not readily disintegrate, and their testing process does not simulate real world plumbing or sewer system conditions.

Wastewater associations from around the world, including the CWWA, formed a body called the International Water Services Flushability Group (IWSFG) in 2017 and developed international guidelines for flushability that tests wipe and other disposable products for toilet and drainline clearance, disintegration, settling, digestion, and fiber analysis. The IWSFG flushability guidelines are widely recognized by wastewater utilities to be representative of real world conditions, however they are voluntary and have not been adopted by or developed through any Standards Council of Canada or ISO-accredited standards development organization. While accredited standards development organizations like CSA Group do not have the power to make the requirements of a standard mandatory, a CSA Group standard can become mandatory if it is referenced in legislation by an authority with jurisdiction, such as the federal government. Although

compliance with a standard for the use of the term 'flushable' in product labeling developed by CSA Group would be voluntary, it would be crucial in defining what it means for a product to be 'flushable,' and could be referenced in future legislation or regulations by the federal or provincial government.

The development of standards through CSA Group is funded by the various stakeholders with an interest in the outcome. This often includes government, industry, advocacy associations and other interested parties. Federal support would enable local governments, including Metro Vancouver, to pursue the development of a flushability standard, which could be instrumental in the success of further efforts to restrict problematic labeling practices.

ALTERNATIVES

1. That the GVS&DD Board support Metro Vancouver to submit a resolution to request federal support for the development of a flushability standard to the Federation of Canadian Municipalities.

2. That the GVS&DD Board receive for information the report dated November 6, 2024, titled "Seeking Federal Support for the Development of a Flushability Standard".

FINANCIAL IMPLICATIONS

There are no financial implications associated with this report.

CONCLUSION

Incorrectly designated "flushable" wipes and other projects significantly impact sanitary infrastructure and cost the Metro Vancouver region $2 million in repairs due to equipment damage, clogs, and overflows. As there are currently no standards or regulations for organizations applying the term "flushable" to manufacturer's products, Metro Vancouver is looking to address these ongoing issues by submitting a resolution to FCM to seek support from the federal government on the development of a flushability standard through an accredited standards development organization.

REFERENCES

1. Canadian Water and Wastewater Association Position on Flushable Wipes
2. 2020 UBCM Resolution on Standards and Labelling of Flushable Wipes
3. 2023 FCM Resolution on Disposable Wipes

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COMMITTEE INFORMATION ITEMS AND DELEGATION SUMMARIES

Greater Vancouver Sewerage and Drainage District
Board Meeting Date – Friday, November 29, 2024

This information item, listing recent information received by committee, is provided for the GVS&DD Board's information. Please access a complete PDF package here.

Liquid Waste Committee – October 30, 2024

Delegations:
No delegations presented

Information Items:
C1 Draft Updates to the Liquid Waste Management Plan

Zero Waste Committee – November 7, 2024

Delegation Summaries:
No delegations presented

Information Items:
E2 Solid Waste and Recycling Industry Advisory Committee 2024 Feedback Summary
E3 Construction and Demolition Waste Reduction Forum

Liquid Waste Committee – November 13, 2024

Delegation Summaries:
C1 Lee Selzer, ACE Tank Services Inc.
No executive summary provided

C2 Ravi Daniels, Pumperguys Tank Service Ltd
No executive summary provided