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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Zero Waste Committee

From: Paul Henderson, General Manager, Solid Waste Services

Date: August 31, 2022 Meeting Date: September 9, 2022

Subject: **Innovation and Continuous Improvement**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated August 31, 2022, titled "Innovation and Continuous Improvement".

EXECUTIVE SUMMARY

Innovation and continuous improvement are core values across Metro Vancouver departments. Over the last year, several continuous improvement initiatives have been implemented in the regional solid waste system resulting in both cost savings, enhanced services and increased recycling and re-use opportunities. Examples of recent continuous improvement initiatives include opening two new recycling and waste centres with expanded re-use and recycling options, approving the development of a Waste-to-Energy Facility District Energy system, and initiating new collaborations including contracting with FoodMesh, funding for member jurisdictions hosting repair events, and establishing two new advisory committees.

In parallel with a study on options for management of garbage, Metro Vancouver will issue a Request for Information to solicit information on innovative technologies to manage garbage. The results of the Request for Information will be reported to the Zero Waste Committee.

PURPOSE

The purpose of this report is to provide an update on some of the completed, ongoing, and future continuous improvement and innovation initiatives in Solid Waste Services.

BACKGROUND

This report provide an annual update on continuous improvement and innovation initiatives within the solid waste function from fall 2021 to summer 2022.

CONTINUOUS IMPROVEMENT & INNOVATIONS

Metro Vancouver strives to consistently increase the value and effectiveness of its facilities, services, and business processes through continuous improvement and innovation. As part of this effort, business processes, policies and regulations, education and behaviour change tools, and waste reduction and recycling programs are constantly evaluated and improved to enhance their efficiency, effectiveness, and flexibility. Over the past 12 months, a number of continuous improvement initiatives have been implemented resulting in both enhanced services, cost savings, and increased opportunities for waste reduction and recycling.

Solid Waste Services strives for operational excellence by continuously improving its business processes, services, and practices. Operating highlights include:

- Opening of United Boulevard Recycling and Waste Centre and Central Surrey Recycling and Waste Centre, increasing recycling opportunities, improving customer experience, and reducing greenhouse gas emissions.
- Accepting bicycles for repair and reuse at North Shore Recycling and Waste Centre.
- Adding recycling items at facilities: Return-It Express and Go, and used oil and antifreeze at North Shore, United Boulevard and Central Surrey recycling and waste centres.
- Terminating the $800,000 per year lease agreement for the Coquitlam Recycling and Waste Centre with the opening of the United Boulevard Recycling and Waste Centre.
- Entering into a contract with Anaconda Systems to support innovative organics processing development in the region.

Innovation towards Zero Waste and the Circular Economy

Actions to support Zero Waste/the circular economy include:

- Contracting with FoodMesh to develop a regional food recovery network to help rescue and redistribute surplus food, moving food up the waste hierarchy to feed animals and people. This network will be integrated with existing food recovery hubs across Metro Vancouver and the Fraser Valley to leverage successes and expand the benefits of food recovery.
- Providing funding for member jurisdictions to host repair café events to further develop the regional share and repair economy. These repair and reuse events welcome attendees to bring in items such as clothing, electronic devices, and small appliances for free assistance to repair the items.
- Implementing 'Re-Use Days' at North Shore Recycling and Waste Centre with Urban Repurpose, which collects items from customers that can be reused instead of recycled and disposed, providing not only a learning opportunity for customers but a service which diverts materials from disposal.

Improving Customer Experience

Customer experience innovations include:

- Developing an online recycling and disposal cost estimator for residents to predict the cost of bringing in material to Metro Vancouver's recycling and waste centres, and City of Vancouver solid waste facilities. This new tool has been used over 7,000 times by the end of July.
- Creating a virtual tour to assist customers with wayfinding at the new United Boulevard Recycling and Waste Centre.

Stakeholder and Community Engagement

Solid Waste Services has expanded the ability for staff to engage and communicate with industry stakeholders, communities of interest and the public as part of ongoing operations and the solid waste management plan update. Equity considerations have been incorporated into the design of the latter. Two new advisory committees have been established and are meeting regularly. Their feedback and input will be part of the plan update.

- Establishing the Solid Waste and Recycling Industry Advisory Committee (Industry

Advisory Committee). The purpose of the Industry Advisory Committee is to provide a forum for industry contribution, discussion, and advice on management planning, operations, and policy issues related to solid waste and recycling services in Metro Vancouver.

- Establishing the Solid Waste Management Plan Public/Technical Advisory Committee (Public/Technical Advisory Committee). There are 30 committee members who represent a diversity of sectors and interests, and bring a variety of personal qualities, perspectives, and experiences to solid waste and recycling issues. During the call for applications, staff reached out to 35 organizations in an effort to target recruitment of potential committee members working on behalf of typically underrepresented or equity-denied communities, specifically youth, cultural, urban Indigenous, and the binners' community. Support mechanisms have been offered to lower barriers to participation, such as childcare, honoraria, transportation and technology supports, and additional meetings as needed.

Current Areas of Focus

Current areas of focus for continuous improvement and innovation in Solid Waste Service are circular economy, waste reduction, and recycling of targeted materials in the waste stream. Examples of current initiatives underway include:

- Initiating a study to review both traditional and innovative garbage management options.
- Developing the Waste-to-Energy Facility District Energy system following signing an agreement to provide energy for heat and hot water to the River District, with the potential to expand to Burnaby and New Westminster in the future. The project will provide heat and hot water for up to 30,000 homes and reduce greenhouse gas emissions by up to 45,000 tonnes per year. The next phase of the project is detailed design along with reaching agreement with the City of Burnaby and City of Vancouver with respect to access to streets for the district energy piping network.
- Undertaking a procurement process to recover recyclables and alternative fuel from small load waste.

Request for Information: Innovative Waste Management Technologies

In parallel with the study reviewing options to manage garbage, Metro Vancouver will issue a Request for Information for Innovative Waste Management Technologies to gauge the marketplace for innovative approaches to managing garbage. The Request for Information will allow innovative solid waste system developers to provide information on:

  - technology approach
  - requirements to implement a system to manage garbage
  - experience in other jurisdictions
  - input and output materials, diversion rates and markets
  - general cost information if available

Staff will report the results of the Request for Information to the Zero Waste Committee and seek direction on next steps.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Activities related to continuous improvement and innovation are covered under the approved Solid Waste Services budget. Where cost savings are realized through these initiatives, the funds are incorporated into the 2023 budget. There are no additional financial implications.

CONCLUSION

Solid Waste Services regularly pursues continuous improvement and innovation opportunities to increase the value and effectiveness of our programs and services. Over the past 12 months, several continuous improvement initiatives have been implemented resulting in both enhanced services, cost savings, and increased opportunities for waste reduction and recycling.

54269283

To: Zero Waste Committee

From: Terry Fulton, Senior Project Engineer, Zero Waste Implementation
Solid Waste Services

Date: August 24, 2022 Meeting Date: September 9, 2022

Subject: **2021 Integrated Solid Waste & Resource Management Plan Biennial Report Feedback**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated August 24, 2022 titled "2021 Integrated Solid Waste & Resource Management Plan Biennial Report Feedback".

EXECUTIVE SUMMARY

The 2021 Biennial Report summarizes progress made to date in implementing the *Integrated Solid Waste and Resource Management Plan*. Following consideration of the draft 2021 Biennial Report at the January 20, 2022 Zero Waste Committee meeting, the report was shared with First Nations and solid waste stakeholders to seek feedback prior to submission to the Ministry of Environment and Climate Change Strategy. Feedback was received from ten respondents including three First Nations. Common themes included prioritizing reduction and re-use initiatives, and revisiting metrics; both of which will be key aspects of the solid waste management plan update process.

PURPOSE

The purpose of this report is to inform the Zero Waste Committee of feedback received on the 2021 Biennial Report on the *Integrated Solid Waste and Resource Management Plan*.

BACKGROUND

Metro Vancouver's *Integrated Solid Waste and Resource Management Plan* was approved by the Minister of Environment on July 22, 2011. A condition of its approval was that Metro Vancouver provide a biennial progress report on the implementation of the plan to the Ministry of Environment and Climate Change Strategy. The draft 2021 Biennial Report was presented to the Zero Waste Committee on January 31, 2022 and was subsequently distributed for feedback from First Nations and solid waste stakeholders.

2021 INTEGRATED SOLID WASTE & RESOURCE MANAGEMENT PLAN BIENNIAL REPORT

Metro Vancouver reports out once every two years on progress in implementing the *Integrated Solid Waste Management Plan*. The Biennial Report, available as a reference to this report, is a summary of progress and supplements the annual recycling and solid waste summary. The Biennial Report includes a summary of strategies, performance measures and progress on the detailed actions in the plan.

Metro Vancouver is among the most successful jurisdictions in North America in reducing solid waste, having met a goal of reducing per capita waste generation by 10%, recycling 64% of waste generated, and disposing of only 0.45 tonnes per capita in 2020.

After steadily increasing each year, reaching 64% in 2018, Metro Vancouver's diversion rate has since plateaued, highlighting the importance of the solid waste management plan update. Key initiatives currently underway that will advance waste reduction and recycling in the region and reduce greenhouse gas emissions include:

- Continued action on single-use item reduction at all levels of government;
- Behaviour campaigns such as Superhabits that encourage waste reduction;
- Collaboration initiatives such as the National Zero Waste Council and Love Food Hate Waste Canada;
- New recycling and waste centres that maximize recycling and reduction opportunities;
- The Waste-to-Energy Facility district energy system;
- Biosolids management at the Waste-to-Energy Facility;
- Beneficial use of bottom ash generated at the Waste-to-Energy facility;
- Recovery of recyclables and alternative fuel from small load waste;
- Working with Food Mesh to expand its regional food recovery network;
- Re-use days at Metro Vancouver recycling and waste centres; and
- Funding assistance for municipal repair cafes.

First Nations Engagement

After review by member jurisdictions and the Zero Waste Committee, the draft Biennial Report was sent to the 34 First Nations with expressed interests in the Metro Vancouver region for feedback between May and July 2022. Metro Vancouver received responses from three First Nations. Two of the respondents noted a lack of capacity for engagement at this time, but asked Metro Vancouver to continue providing information. The third response confirmed receipt of the Metro Vancouver outreach, but noted had no comments at this time. Metro Vancouver provided responses to all respondents and encouraging continued feedback as part of the solid waste management plan update process.

Stakeholder Engagement

The draft Biennial Report was sent a database of solid waste stakeholders (3,789 subscribers) for feedback between May and July, 2022. Metro Vancouver received comments from 7 stakeholders, Zero Waste BC/Zero Waste Canada, Vancouver Coastal Health, Mind Your Plastic and four individuals also provided feedback. Metro Vancouver provided responses to all submissions noting each respondent's concerns and encouraging continued feedback as part of the solid waste management plan update process.

Overall feedback indicated support for focusing on reduction and re-use initiatives as well as a desire to provide more meaningful metrics. Specific areas of focus included:

- Emphasizing the importance of collaboration;
- Continuing to harmonize waste reduction and recycling policies;
- Ensuring clear terminology and prioritization of initiatives;

- Providing more information on reduction, re-use and repair initiatives;
- Continuing to work on reduction and diversion of paper products;
- Supporting markets for clean wood;
- Exploring expanded recycling and organics processing capacity;
- Enhancing the disposal ban program;
- Expanding single-use plastic reduction initiatives;
- Addressing concerns related to energy recovery processes; and
- Evaluating solid waste residual disposal options.

All written feedback received is included in the attachment, which will be submitted with the Biennial Report to the Ministry of Environment and Climate Change Strategy. The feedback and themes highlighted will be reviewed by staff and are considered inputs into the solid waste management plan update. Metro Vancouver will continue to advance waste reduction in the region, and waste reduction opportunities will be a key focus in the development of an updated regional solid waste management plan.

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

FINANCIAL IMPLICATIONS
Metro Vancouver's recycling and waste reduction initiatives are implemented within the annual budgets for the Solid Waste Services department. Funds for the review of the regional solid waste management plan are contained in the proposed future departmental budgets.

CONCLUSION
Feedback on Metro Vancouver's 2021 Biennial Report indicates a desire to focus on re-use and reduction initiatives, which is consistent with the waste management hierarchy and the goals of the *Integrated Solid Waste and Resource Management Plan*. Much of the feedback reflects key priorities of the solid waste management plan update process, including revisiting goals and metrics related to waste reduction and re-use. Metro Vancouver has compiled all feedback received and will submit it along with the final 2021 Biennial Report to the BC Ministry of Environment and Climate Change Strategy.

Attachment
1. Feedback Received on the 2021 Integrated Solid Waste and Resource Management Plan Biennial Report

References
1. Draft 2021 Biennial Report

54172193

To Whom It May Concern:

Re: Metro Vancouver Biennial Solid Waste Management Plan Progress Report:

Thank you for the opportunity to comment on the progress report. Zero Waste BC is a non-profit association dedicated to driving systemic change towards Zero Waste in BC. Zero Waste Canada is a non-profit grassroots organization and the Canadian national affiliate of the Zero Waste International Alliance dedicated to ending our age of wastefulness through policy development, certification, and education.

Zero Waste: "The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health."
Our current resource consumption systems of linear take-make-waste not only create waste but also generate a huge amount of greenhouse gases which constitute some of the discharges that threaten the environment and human health. EPR programs can play a key role in changing these consumption systems. For more information on Zero Waste, please see the Zero Waste Hierarchy.[1]

When reviewing the biennial report, we would like to first point out the many positive initiatives that have or are taking place under the involvement of Metro Vancouver. These include as mentioned in the report:

- Conducting biennial waste composition studies to better understand what types and volumes of waste are being generated. It is very challenging to develop a clear action plan in respect to the reduction of waste going to disposal without first understanding what and how much is going into the waste.
- Convening a Solid Waste Management Plan Independent Consultation and Engagement Panel in order to provide direct feedback from industry experts that will shape the future of Metro Vancouver activities for managing solid waste and its respective infrastructure in the future.

- Conducting a Single-use Items study to shape policy and activities around the reduction of single-use items. Developing the toolkit.

- Being part of the Canada Plastic Pact in order to set meaningful targets and actions needed to create a circular plastics economy.

- Expanding on regional recycling centres with the construction of the Central Surrey and United Boulevard waste and recycling centres.

[1] Zero Waste Hierarchy: https://zerowastecanada.ca/zero-waste-hierarchy/.

- Exploring how Metro Vancouver can support diverting commercial organic waste from landfills and incinerators by exploring the option of providing organics transfer services at their regional facilities.

- The continue implementation and improvement in the effectiveness of the regional disposal bans.

- Supporting the National Zero Waste Council in their food waste, single-use items, and plastic waste reduction initiatives.

- Started to pilot reuse initiatives at Recycling and Waste Centres.

- Researching safe and responsible disposal sites outside of region as the region works to reduce waste through reduction, reuse, recycling, and composting in region. By sending waste outside of region eliminates the unintended consequence of developing facilities and a in region waste system that is counter to the regions goals of Zero Waste.

- Updating the toolkit for construction and demolition (deconstruction) materials.

- Creation and sharing of behaviour change campaigns.

- Supporting repair cafes and food recovery.

- The continued support of recycling with various actions such as working with EPOR programs to improve their performance and supporting the RCBC online information hub.

There are a few areas of concern that we feel do not align with international Zero Waste policies and strategies which are mentioned in the biennial report and which divert valuable resources away from more beneficial initiatives. These include:

- **Directing resources towards research for beneficial use of bottom ash from waste incinerators:**
  Metro Vancouver's Burnaby Waste Incinerator was built in 1988 and the technology for this facility is outdated. Metro Vancouver has voted against investing in best available technology for both the emissions filtration and emissions monitoring systems. According to the Zero Waste International Alliance and the Energy Justice Network, the incineration of waste is counter productive in a region that is striving towards Zero Waste and trying to reduce the volumes of waste that is being discarded into incinerators and landfills. While bottom ash from an incinerator is deemed to be safe for burying in a properly managed landfill, it is not void of heavy metals or other toxins. Because of this, it is not practical or responsible to spend additional resources towards finding a beneficial use for a material that could come with a significant amount of liability and most likely will be phased out over the next 5 years.

- **Diverting biosolids to the Burnaby incinerator:**
  Biosolids are an organic material that should be processed as such and not sent to be burned in an incinerator. Doing this is against the narrative that the Burnaby incinerator is not in competition with wet organic material and that it generates energy from waste. The reasoning behind sending biosolids to the Burnaby incinerator is to cool the system down in order to be able to deliver more waste which primarily contains plastic and fiber. Doing this would further increase a dependence on a system that is expensive, outdated, and not necessary for the management of solid waste in the 21st century.

- **Directing resources toward research for district heating from the incineration of waste:**
  As mentioned above, directing resources towards finding solutions that would justify the continue incineration of waste is both a poor use of public funds and irresponsible. This does not take into account that the region as a whole is working towards Zero Waste which includes a mandate to find solution that would divert all waste from incineration.

- **Investigating using non-recyclables as fuel:**
  Researching ways to use non recyclable discards as fuel only serves the purpose of hiding poor design while ignoring the design flaws in products, process, policy, and logistics. Efforts should be put towards finding solutions to either eliminate poorly designed products from the market place by supporting better alternatives, increased durability, and usefulness of materials and products. This can be best accomplished today by looking at the highest and best use of clean wood instead of using it as fuel.

Recommendations:

Despite significant efforts in the area of recycling, there has been minimal progress in the reduction of waste as a whole. Metro Vancouver and their respective municipalities place a significant amount of responsibility on the regions EPR programs and their ability to collect and responsibly manage all material within their programs. The reality is that the regional EPR programs struggle to collect all materials in their program setting low recovery targets, and they also struggle in responsibly managing materials that do not have established recycling markets such as low-grade plastics, products made with multiple materials, or materials that contain toxins such as brominated fire retardants. Further more, these programs do nothing in the area of reduction and reuse of waste and often compete against these valuable initiatives. With this in mind, we offer the following recommendation to improve Metro Vancouver's Solid Waste Management Plan going forward:

- Put more emphasis and resources towards supporting municipalities and other organizations in the pursuit of meaningful, and effective reduction and reuse activities. This includes advocating to the Ministry of Environment to ensure that all EPR programs shift their focus towards repair, reuse and refill of their products and packaging with recycling as the last resort.

- Ensure that Metro Vancouver is clear with their terminology and not misrepresent the action of recycling (which is about cycling the material back into a purpose as close to its original as possible) with misleading terms such as advanced recycling or recycling to fuel etc. These terms are used to confuse the public into accepting the destruction of materials and resources through burning, as a form of recycling, which it is not.

- Continue to work on the reduction and diversion of paper and cardboard which remains 19% of the waste. There are many opportunities to encourage decreased paper use as well as proper recycling. Input to the EPR program for this should be ongoing and not assumed that EPR is solely responsible.

- Avoid the temptation of further investing in the idea of burning waste as a solution to waste management. The more resources spent looking at this solution which has been proven to be flawed, the less resources there are to focus on waste reduction, reuse, recycling and composting, which have a much higher return on investment for the region as a whole. Instead phase out burning waste and redirect those funds towards Zero Waste actions.

- Develop an action plan to support a networked system of clean wood processors who will use the wood to create marketable products (not energy). Possibly work with King County to learn from their plans as well as neighbouring regions to ensure the system is scaled to the local supply.

- Given that there are sometimes challenges processing organics, that there will continue to be an ongoing supply and this will not be part of an EPR program, Metro Vancouver should support the development of a strong and robust composting industry.

- Supporting an online information hub for reduction, reduce, reuse, repair and refilleries (possibly in partnership with RCBC with a goal that it covers the whole province).

- Work to further enhance the disposal bans by adding inspectors, improving formal training and culture of diversion for the inspectors, and conduct various pilot programs to find solution for more meaningful inspection process such as sampling and inspecting waste in black bags. Consider adding a clear bag mandate to make it easier to inspect loads.

- Work with adjacent regions to implement similar disposal bans to prevent private haulers transporting waste to adjacent regions for the purpose of circumventing disposal bans. Gather full data on all waste collected to ensure that the data set is complete, including all waste collected by private haulers

- Advocate for the federal and provincial government to restrict the export of waste by private companies who wish to circumvent regional disposal bans.

- Advocate for the National Zero Waste Council to adopt the international definition of Zero Waste and the Zero Waste Hierarchy 8.0 (see appendix)

Questions:

Metro Vancouver is to be congratulated for having the best data set on its waste of all regional districts. We have some questions on it:

- Estimates are provided for out of region disposal on page 12 for four years. What are the current estimates and has this changed?
- What are the costs per tonne of each disposal method for both operational costs only and for costs including capital costs?
- What monitoring is being done of the United Boulevard centre to see if leachate from the use of bottom ash is occurring?
- Under 2.6.2 it states there is very little organics remaining in waste from single family homes yet the waste composition study shows 25% of waste is compostable organics. Why are single family homes not considered for further action to support organics diversion along with MF and ICI?

Again, thank you for the opportunity to provide feedback and we would be happy to discuss these matters further.

Sincerely,

Jamie Kaminski
Jamie.kaminski@zerowatecanada.ca
On behalf of Zero Waste Canada

And

Sue Maxwell
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On behalf of Zero Waste BC

Zero Waste Hierarchy of Highest and Best Use 8.0

Purpose

The Zero Waste Hierarchy describes a progression of policies and strategies to support the Zero Waste system, from highest and best to lowest use of materials. It is designed to be applicable to all audiences, from policy-makers to industry and the individual. It aims to provide more depth to the internationally recognized 3Rs (Reduce, Reuse, Recycle); to encourage policy, activity and investment at the top of the hierarchy; and to provide a guide for those who wish to develop systems or products that move us closer to Zero Waste. It enhances the Zero Waste definition by providing guidance for planning and a way to evaluate proposed solutions. Users are encouraged to develop policies and actions starting at the top of the hierarchy.

Zero Waste Definition

Zero Waste: The Conservation of all resources by means of responsible production, consumption, reuse, and recovery of all products, packaging, and materials without burning them and with no discharges to land, water, or air that threaten the environment or human health.

*Guiding Principles

Closed Loop Systems	Design systems to be closed loop rather than linear in their use of resources
Close to Source	Processes to occur as close to the source as practical
Conservation of Energy	More energy can be saved, and global warming impacts decreased, by reducing waste, reusing products, recycling and composting than can be produced from burning discards or recovering landfill gases.
Do Not Export Harm	Avoid the export of toxic or potentially toxic waste or materials, as well as materials with limited or undefined recycling markets that will be landfilled or incinerated in other regions.
Engage the Community	Promote changes and systems that work with communities to facilitate meaningful and sustained participation, increase understanding, and influence behaviour change and perceptions
Highest and Best Use	Creating and keeping materials and products for a use as high on the hierarchy as possible and in the useful loop as long as possible. Keeping materials from being downcycled where the number of future uses or options are limited. Source separate items and materials to the extent necessary to ensure clean and marketable products and materials for reuse, recycling and composting streams.
Information & Improvement	Collect information on systems and use as feedback for continuous improvement
Local Economies	Support the growth and expansion of local economies (production, repair, and processing) in order to reduce greenhouse gases from transportation, improve accountability and resiliency, and increase repair and parts opportunities
Materials Are Resources	Preserve materials for continued use and use existing materials before harvesting virgin natural resources
Minimize Discharges	Minimize all discharges to land, water or air that threaten the environment, or human health, including climate changing gases
Opportunity Costs	Consider opportunity costs of investments and ensure investments occur as high as possible on the Hierarchy
Precautionary Principle	Ensure that a substance or activity which poses a threat to the environment is prevented from adversely affecting the environment, even if there is no conclusive scientific proof linking that particular substance or activity to environmental damage
Polluter Pays	Whoever causes environmental degradation or resource depletion should bear the “full cost” to encourage industries to internalize environmental cost and reflect them in the prices of the products
Sustainable Systems	Develop systems to be adaptable, flexible, scalable, resilient, and appropriate to local and global ecosystem limits

Zero Waste Hierarchy 8.0

RETHINK/REDESIGN Systemic change to move towards a closed loop** model; redesign of systems to avoid needless and/or wasteful consumption. Actions that address the root causes of the current linear use of materials.	
1	Consider if a purchase is necessary and reject unnecessary, unsolicited items
2	Design and purchase products from reused, recycled or sustainably-harvested renewable, non-toxic materials to be durable, repairable, reusable, fully recyclable or compostable, and easily disassembled
3	Shift funds and financial incentives to support a Circular Economy** over the harvesting and use of virgin natural resources
4	Enact new incentives for cyclical use of materials, and disincentives for wasting
5	Facilitate change in how end users' needs are met from "ownership" of goods to "shared" goods and provision of services
6	Support and expand systems where product manufacturing considers the full life-cycle of their product in a way that follows the Zero Waste Hierarchy and moves towards more sustainable products and processes. Producers take back their products and packaging in a system that follows the Zero Waste Hierarchy.
7	Identify and phase out materials that cause problems for Closed Loop Systems*
8	Facilitate and implement policies and systems to encourage and support Local Economies*
9	Re-consider purchasing needs and look for alternatives to product ownership
10	Provide information to allow for informed decision-making
11	Eliminate or avoid systems that drive needless consumption
REDUCE Measures taken to reduce the quantity and toxicity of resources, products, packaging and materials as well as the adverse impacts on the environment and human health (while reduction is noted here it is acknowledged that people's basic needs should be met; not everybody needs to reduce).	
12	Plan consumption and purchase of perishables to eliminate or avoid discards due to spoilage and non-consumption
13	Implement Sustainable Purchasing** that supports social and environmental objectives as well as local markets
14	Minimize quantity and toxicity of materials used
15	Minimize ecological footprint required for product, product use, and service provision
16	Choose products that maximize the usable lifespan and opportunities for continuous reuse
17	Choose products that are made from materials that are easily and continuously recycled
18	Prioritize the use of edible food for people
19	Prioritize the use of edible food for animals
REUSE Actions by which products or components are used again for the same or similar purpose for which they were conceived. Actions that support the continued use of products in ways that retain the value, usefulness and function.	
20	Maximize reuse of materials and products
21	Maintain, repair or refurbish to retain Value**, usefulness and function
22	Remanufacture with disassembled parts; dismantle and conserve "spare" parts for repairing and maintaining products still in use
23	Repurpose products for alternative uses

RECYCLE/COMPOST Actions by which discards are mechanically reprocessed into products or materials or biologically processed to return to the soil.	
24	Support and expand systems to keep materials in their original product loop and to protect the full usefulness of the materials
25	Maintain diversion systems that allow for the highest and best use of materials, including organics
26	Recycle and use materials for as high a purpose as possible
27	Develop resilient local markets and uses for collected materials wherever possible
28	Provide incentives to create clean flows of compost and recycling feedstock
29	Support and expand composting as close to the generator as possible (prioritizing home, on site or local composting)
30	Consider industrial composting whenever home/decentralized composting is not possible, or if local conditions require/allow anaerobic digestion
MATERIAL RECOVERY Any operation to salvage additional materials after the actions above. Does not include energy recovery and the reprocessing into materials that are to be used as fuels or other means to generate energy, which are unacceptable practices.	
31	Maximize materials recovery from mixed discards after extensive source separation
32	Consider chemical processing for recycling** in the form of repolymerization (i.e. Plastic-to-Plastic or P2P) only for materials which are not suitable for mechanical recycling
33	Backfilling**
RESIDUALS MANAGEMENT Handling of discards that were wasted in a way that does not threaten the environment or human health. Analyze what was wasted and why.	
34	Examine materials that remain and use this information to refine the systems to rethink, reduce, reuse, and recycle in order to prevent further discards.
35	Ensure minimization of impacts by means of biological stabilization of fermentable materials. Recover energy using only systems that operate at Biological Temperature and Pressure**
36	Encourage the preservation of resources and discourage their dispersal and Destructive Disposal**
37	Plan systems and infrastructure to be adjusted as discards are reduced and its composition changes
38	Minimize Gas Production and Release** and maximize gas collection
39	Use existing landfill capacity and maximize its lifespan. Ensure it is Responsibly Managed. **
40	Contain and control, for responsible management, discards that threaten the environment or human health.
UNACCEPTABLE Systems and policies which encourage wasting or threaten the environment and human health.	
41	Don't allow policies and systems that encourage the Destructive Disposal and/or the destruction of discards
42	Don't allow energy and Destructive Disposal systems that are dependent upon the continued production of discards
43	Don't allow the Incineration** of discards
44	Don't allow discards to be used in products or materials that risk or cause adverse environmental or human health impacts.
45	Don't allow chemical processing of discards into fuel** (i.e., Chemical Processing of Plastics to Fuel)
46	Don't allow the use of discards in cement kilns

****Definitions:**

Biological Temperature and Pressure	The ambient temperature and pressure that occurs naturally without the use of added energy, or in any case not above 100 degrees Celsius or 212 degrees Fahrenheit.[1]
Backfilling	Any operation where suitable non-hazardous, non-contaminated inert material such as stone, soil, clay, sand, brick, porcelain, ceramic, or glass is used for purposes of reclamation in excavated areas or for engineering purposes. Discards used for backfilling must be suitable for the aforementioned purposes, and be limited to the amount strictly necessary to achieve those purposes.
Circular Economy	An industrial economy that is, by design or intention, restorative and in which material flows are of two types, biological nutrients, designed to re-enter the biosphere safely, and technical nutrients, which are designed to circulate at high quality without entering the biosphere. Materials are consistently reused rather than wasted. All options that cause leakage or losses of material from their circular management (such as incineration, co-incineration, fuel production, fuel use, and the like) are not part of a Circular Economy system. Circular economy should be clearly defined to follow the Zero Waste Hierarchy and not show energy recovery as a process prior to landfilling.
Chemical Processing for Recycling	Processing of carbon-based materials such as plastics repolymerization (Plastic-to-Plastic or P2P). I.e., recovery as new polymers not intended for fuels. This may include solvolysis, solvent-based purification, and the like. Recovery of material for recycling must be over 90%.
Chemical Processing for Fuel	Any type of process {for example , Plastics to Fuel (P2F), that converts – typically through thermal cracking – most of the carbon included in plastics, into a syngas and/or other fuel. It may also be inappropriately described as “chemical recycling” or “advanced recycling”.
Closed Loop System	A system not relying on matter exchange outside of the system, as opposed to open loop where material may flow in and out of the system.
Destructive Disposal	Discarded materials placed in a landfill or in an Incineration** facility
Discards	Materials that are disposed of because they are no longer useful or desirable to their current owner. This includes but is not limited to materials sent for reuse, composting, recycling, landfilling, or incineration.

[1] Unless higher temperatures are required as a pretreatment, not to exceed 150 degrees Celsius (e.g., to control diseases, or reduce pathogens) to be then subject to composting or Anerobic Digestion; the pretreatment should never be used to destroy materials.

Incineration	Incineration is a form of Destructive Disposal via combustion or thermal conversion/treatment of discarded materials into ash/slag, syngas, flue gas, fuel, or heat. Incineration includes facilities and processes that may be stationary or mobile, may recover energy from heat or power and may use single or multiple stages. Some forms of incineration may be described as resource recovery, energy recovery, trash to steam, waste to energy, energy from waste, fluidized bed, catalytic cracking, biomass, steam electric power plant (burning waste), pyrolysis, thermolysis, gasification, plasma arc, thermal depolymerization, refuse derived fuel, or chemical processing of plastics to fuel.
Minimize Gas Production and Release	Keeping out source-separated organics and biologically stabilizing the materials that go into landfill. For existing landfill cells that already contain unstabilized organics, the gas production should be minimized by keeping out rainwater and not recirculating leachate. Minimize methane release by permanently capping closed cells with permanent covers and installing gas collection systems within months of closure (not years). Maintain high suction on collection wells and do not damp down wells or rotate off the wells to stimulate methane production. Filter toxins in the gas into a solid medium that is containerized and stored on site. Note that this is not considered a renewable energy.
Problematic for a Closed Loop System	Materials that make it hard to recycle or compost the materials themselves or other materials. These may be contaminants for a material (like some forms of biodegradable plastics or stickers on fruit and vegetables) or materials that clog processing systems (like plastic bags)
Responsibly Managed Landfills	Manage landfills to minimize discharges to land, water or air that threaten the environment and human health. This must include plans for closure and financial liability.
Sustainable Purchasing	The purchase of goods and services that take into account the economic value (price, quality, availability and functionality) and the related environmental and social impacts of those goods and services at local, regional, and global levels.
Value	The importance, worth, or usefulness of something that may be economic, social, environmental, cultural, or sentimental.

Solid Waste Services
Tel. 604 432-6400 Fax 604 451-6180

July 26, 2022

File: CP-02-01

Sue Maxwell
VIA EMAIL: suemaxwell@zerowastebc.ca

Jamie Kaminski
VIA EMAIL: jamie.kaminski@zerowastecanada.ca

Dear Sue Maxwell and Jamie Kaminski:

Metro Vancouver's 2021 Integrated Solid Waste and Resource Management Plan Biennial Report

Thank you for your thoughtful and detailed feedback on the Integrated Solid Waste and Resource Management Plan Biennial Report. We appreciate your commitment to zero waste principles and look forward to working together to continuously improve the region's solid waste management system.

Metro Vancouver, Zero Waste BC and Zero Waste Canada share the philosophy that reducing waste through effective policy, product redesign, and individual action is the best and most sustainable option for reaching our waste management goals, as outlined in the Integrated Solid Waste and Resource Management Plan. Consideration is first given to viable reduction and re-use options before proceeding to evaluate options for recycling, energy recovery, and residuals disposal. The initiatives regarding waste recovery that you have highlighted in your response are part of a multi-faceted approach that looks at all aspects of the waste hierarchy.

An updated solid waste management plan will allow us to move beyond the current plateau in waste generation rates and continue to make meaningful progress. Potential strategies go beyond Metro Vancouver's actions to include working closely with other levels of government, the waste management industry as a whole, and the public; together we make our region strong. We invite your continued feedback throughout the process on how we can continue to deliver affordable, accessible and sustainable waste management service to the region while prioritizing the highest and best uses of materials.

Please find the answer to your questions below:

- Estimates are provided for out of region disposal on page 12 for four years. What are the current estimates and has this changed?

Waste flows are challenging to predict because a number of factors affect waste flows beyond waste reduction efforts. For example, Metro Vancouver has received significant quantities of residuals from private construction and demolition material processing facilities commencing in mid-2021. These materials were historically going to private disposal facilities, one of which we understand closed in mid-2021. Flood impacts also affected waste quantities in 2021 as adjacent regional district solid waste systems were impacted by the floods, and local disposal bans were relaxed given logistics and processing

challenges. In 2020, we saw reduced waste quantities as a result of commercial impacts in sectors such as restaurants in the early stages of the pandemic. 2022 is showing both increased commercial waste as well as additional impacts due to quantity restrictions at private facilities processing construction and demolition materials. Metro Vancouver's approach to waste quantity projections is to review current quantities as well as expected recycling and waste system changes, and update those estimates on an annual basis. Metro Vancouver's solid waste system is robust with multiple disposal options to support changes in solid waste quantities. Metro Vancouver also sees the current solid waste management plan update process as an important opportunity to identify and implement new options to reduce waste across the regional system.

• What are the costs per tonne of each disposal method for both operational costs only and for costs including capital costs?

Metro Vancouver's solid waste services division reports financial plans, capital costs, and waste flow information to the Zero Waste Committee periodically throughout each year. Detailed cost information can be found in Zero Waste Committee meeting agendas and minutes by searching here.

• What monitoring is being done of the United Boulevard Centre to see if leachate from the use of bottom ash is occurring?

Landfill leachate from the Coquitlam Landfill (a historic landfill on which the United Boulevard Recycling and Waste Centre was developed) is discharged to the Metro Vancouver sewer system and monitored on a regular basis. Groundwater monitoring is also completed by a third party consulting firm with results of the program reported to the Ministry of Environment and Climate Change Strategy.

A key element of the United Boulevard Recycling and Waste Centre construction is that the entire 6.2 hectare site has been capped as part of the facility development either through installation of paved surfaces or landscaped areas with underlying plastic membranes.

• Under 2.6.2 it states there is very little organics remaining in waste from single family homes yet the waste composition study shows 25% of waste is compostable organics. Why are single family homes not considered for further action to support organics diversion along with MF and ICI?

Metro Vancouver recognizes there is still work to be done in increasing diversion of organics from the single-family residential sector. Recent changes to some of our outreach campaigns such as "Food Isn't Garbage" have emphasized the basic message that food belongs in the green bin while including specific content targeted to segments of the population that have shown less interest in diverting their food scraps. Metro Vancouver continues to work toward improving diversion in all sectors while recognizing that the multi-family and commercial/institutional sectors have distinct challenges that need to be addressed in order to reach the level of organics recycling that are being achieved in single-family homes, where green bins are typically more accessible and convenient.

Please note that all the responses received, including your submission, will be considered as part of the process to update the solid waste management plan. All feedback will be reported to the Ministry of Environment & Climate Change Strategy and the Metro Vancouver Board.

Again, we appreciate your interest and commitment to waste reducing and recycling as well as advancing the circular economy.

We would be happy to meet with you if you want to discuss any of your suggestions/questions in more detail. If you want to meet email me at paul.henderson@metrovancouver.org or call at 604 603 2294.

Sincerely,

Paul Henderson, P.Eng
General Manager, Solid Waste Services, Metro Vancouver
SD/PH/nvd

54189469

Dear Metro Vancouver and the Zero Waste Committee,

Thank you for the opportunity to participate and respond to your biennial report. We have reviewed the 2021 Integrated Solid Waste and Resource Management Plan Biennial Report to better understand the achievements as well as the ongoing work happening to address waste in Metro Vancouver. Our comments outline several opportunities to engage in further waste reduction and promote collaboration across sectors to improve waste reduction outcomes, particularly for single-use plastics (SUPs).

On expanding single-use bans and extended producer responsibility:

- Currently, the ban on SUPs in the Metro Vancouver area exists in a patchwork of policies, without a cohesive approach across the region.
    - Metro Vancouver should continue to promote harmonization of the bans and SUPs policy across the region, so that there is a clear and consistent approach to plastic waste reduction allowing residents and businesses to successfully participate across municipal jurisdictions.
    - Harmonization of policy would reduce confusion and allow for more widespread use of educational materials and resources related to bans, recycling, and EPR for plastic.
- Improving effectiveness of single-use plastic reduction plans and bans.
    - Metro Vancouver should continue to encourage effective use of SUPs reduction policy across Metro and policy that is wholly dedicated to the reduction of plastics as well as investing in a circular economy.
    - For example, the newly implemented single-use cup fee in Vancouver, which experienced some criticism for its initial version, which was said to create barriers for low-income residents of the city. However, there are additional questions about how businesses are using the fee collected on single-use cups, as there is no mandated use for the fee in the ban policy. Without direction on reinvesting the fee into plastic waste reduction initiatives or circularity, there is a concern that businesses may keep the fee as profit or as a loophole to maintain the price of their product, nullifying the deterrent for consumers to avoid purchasing single-use cups.
- Encouraging further policy action at the municipal level to ban other problematic SUPs.
    - Other jurisdictions across Canada and Europe have prioritized a ban on plastic items such as condiment sachets, cotton buds, balloon sticks, plastic produce wrappers, etc.
    - Metro Vancouver should continue to support interest from municipalities to ban further single-use plastic items.
- Supporting and facilitating collaboration between industry and government (both municipal and provincial) concerning the expansion of EPR to account for flexible plastic packaging and end-of-life fishing gear.

On managing and reducing waste related to end-of-life fishing gear:

- Emphasizing end-of-life fishing gear in the waste and resource management plan
    - The Report has no mention of fishing gear waste or creating a strategy to manage end-of-life of fishing gear (or abandoned, lost or otherwise discarded fishing gear, ALDFG) in Metro Vancouver and its waterways.
    - Working with municipalities and actors in the fishing industry, Metro Vancouver can seek to understand what end-of-life fishing gear collection and recycling practices would work best in the regional context.
- EPR schemes should also be considered for fishing gear and ensuring that end-of-life is managed through financial and operational support from those that manufacture the gear.
    - This would include drafting and implementing strategies to manage plastic fishing waste. For example, how to isolate polymers in multi-material gear to effectively recycle or reuse fishing ropes, collection of end-of-life gear in the harbour or collection points/bins, designated facilities for end-of-life fishing gear, etc.
    - A strategy for addressing end-of-life fishing gear would also likely require an education program as well as public information campaigns for commercial and recreational fisheries.

On engaging industrial, commercial, and institutional (ICI) locations in waste collection:

- Working with municipalities and private waste collectors to meaningfully engage with ICIs and enable consistent and effective waste collection– including recycling and composting.
    - If non-residential sources are responsible for 60% of the annual waste disposed in Metro Vancouver, all ICIs should be an active participant in local waste management and plastic waste reduction.
    - This could include setting targets to improve ICI diversion rates with the goal of achieving rates similar to residential collection.

On reusables and shifting waste management to waste reduction:

- As noted in the Report, reusable pilots are essential to support the reduction of single-use plastics. Metro Vancouver should continue to encourage municipalities and provide financial, educational, and operational support for reusable pilots.
    - Often recycling takes priority in the circularity of plastics, but reusables are a way in which plastic waste can be avoided completely as a proactive measure to reduce waste overall.
    - Additionally, it is important to continue to promote and organize repair workshops for common household items to increase longevity of products and empower consumers with the knowledge to repair their own items.
- Recognizing the need for recycling and composting at local festivals and events as reported is important, but reusables should also be emphasized as a viable municipal policy alternative for these events.

- Research can be performed to determine the best practices and how to build reusable infrastructure in the region.
- Pilots can be conducted for different event types to see if and how reusables work as a replacement for single-use products at municipal events.

Our feedback focuses largely on the policy potential to expand bans and EPR, the lack of reference to waste reduction infrastructure for end-of-life fishing gear, ICI engagement, and reusables. The Report highlights the important work that is being done, but there are additional strategies that could be considered to make the waste and resource management plan more impactful, as outlined in the comments above.

Thank you for the opportunity to provide feedback on the 2021 Integrated Solid Waste and Resource Management Plan Biennial Report. The report is a compelling example of how much progress can be made at the municipal level when actors are committed to finding meaningful solutions for waste reduction.

Sincerely,

Mind Your Plastic

Solid Waste Services
Tel. 604 432-6400 Fax 604 451-6180

July 26, 2022

File: CP-02-01

Michelle Brake
Environmental Policy Analyst
Mind Your Plastic

Via email: michelle@mindyourplastic.ca

Dear Michelle Brake,

Metro Vancouver's 2021 Integrated Solid Waste and Resource Management Plan Biennial Report

Thank you for your thoughtful feedback on the Integrated Solid Waste and Resource Management Plan Biennial Report. Metro Vancouver shares your commitment to reducing waste from plastics and other single-use items and we encourage you to continue to provide feedback through our solid waste management plan update process to help us improve the region's waste management system. The actions taken by non-profit organizations such as yours to help reduce single-use plastic in this region are commendable, and building on that momentum through collaboration and effective policy will help us realize meaningful change.

Please note that all the responses received, including your submission, will be considered as part of the process to update the solid waste management plan. All feedback will be reported to the Ministry of Environment & Climate Change Strategy and the Metro Vancouver Board. If you have not done so already, please subscribe to the Solid Waste Mailing List and tick the box 'Solid Waste Management Plan Update' to receive all notifications related to the plan update, including reports on input such as yours.

Sincerely,

Paul Henderson, P.Eng
General Manager, Solid Waste Services, Metro Vancouver
SD/PH/nvd

54189469

Vancouver Coastal Health

Health Protection
#1200 - 601 West Broadway
Vancouver, BC V5Z 4C2
604-675-3800

Solid Waste Operations
Metro Vancouver
Metrotower III, 4515 Central Boulevard
Burnaby, BC, V5H 0C6

July 4, 2022 via email: solidwasteoperations@metrovancouver.org

Re: 2021 Integrated Solid Waste & Resource Management Plan Biennial Report

Dear Metro Vancouver Solid Waste Operations team,

Climate change is a growing public health concern, with the health impacts notably evidenced in the June 2021 heat dome and November 2021 atmospheric rivers. Vancouver Coastal Health (VCH) recognizes the essential role that solid waste management plays in contributing to a sustainable, livable region, reducing our reliance on raw materials to produce materials, and preventing improper waste disposal that may harm our environment and wildlife. The 2021 Biennial Report on Metro Vancouver's Integrated Solid Waste and Resource Management Plan (ISWRMP) was reviewed by VCH's Healthy Environments team and Public Health Engineer. We appreciate the opportunity to review and comment on the report and look forward to the anticipated update of the plan in the near future.

We commend the efforts and actions completed by Metro Vancouver on the ISWRMP. It is clear Metro Vancouver has utilized a multi-pronged approach to reducing waste in the region and is a leader in the dialogue around waste diversion, particularly through the creation of the National Zero Waste Council.

We offer the following considerations for the ISWRMP update:

- **Prioritize actions and strategies** - Clarity on the prioritization of the identified actions and strategies to better illustrate which actions are expected to generate the highest impact with regards to waste diversion. This is currently unclear in the 2021 Biennial Report and 2011 strategies identified in the report.

- **Strengthen and specify metrics:**
    - **Multi-unit residential and commercial waste diversion** - Recognizing the challenges faced in improving waste diversion rates in multi-unit residential buildings (multi-family) and commercial / institutional sectors, we suggest strengthening the metrics to better capture their waste diversion rates and developing explicit strategies to target their waste diversion. As the region continues to densify, we recognize that multi-unit residential buildings will continue to house a large portion of the region's population and are expected to therefore, generate large quantities of waste.
    - **Effectiveness of Metro Vancouver permitting** – We suggest the inclusion of a metric that evaluates the effectiveness of the air quality permits issued under action 2.6.2(a)(i), particularly in relation to complaints. As organics recycling has increased over time, VCH has also received complaints that may be linked to these processing facilities. In addition to the monitoring systems developed under the ISWRMP, we encourage this additional

Vancouver CoastalHealth

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metric paired with VCH's metrics to ensure, where possible, these issues are mitigated in advance.

- **Effectiveness of information sharing and education** – The zero waste campaigns generated by Metro Vancouver leave impressionable and memorable messages that provide clear direction towards waste diversion. VCH understands it is difficult to directly correlate information sharing and education with increased diversion rates; however, we encourage Metro Vancouver to include a metric to illustrate the broadening of audiences and scope of these actions. This may help illustrate increased appetite across the region to participate in waste diversion.

- **Identify opportunities to address the challenges and progress in**:
  - **Availability of processing facilities and private sector recycling** – The Biennial Report identifies the lack of local availability of processing capacity and markets as a challenge, and we note the additional gap in the availability of industrial land to help address this issue. Though multi-factored, we encourage the inclusion of a solution that addresses this gap, particularly as Metro Vancouver works towards increasing organic material diversion from commercial sites and multi-unit residential.

- **Include exploration and transparent decision-making around**:
  - **Renewed exploration of waste-to-energy facilities** – We are curious as to why procurement for a secondary waste-to-energy (WTE) facility has been discontinued. It is not clear if the current forecasts do not anticipate the need for an additional WTE, or if it has been dropped in favour of landfill options.
  - **Landfill alternatives** – As discussion continues around additional measures used to divert the region's waste, we encourage transparent communication and opportunities to comment on the criteria in selecting the best options moving forward. We also encourage consideration of handling new forms of waste generated as new technologies emerge (e.g. e-bike batteries) and including this in option evaluation.

The 2021 Biennial Report highlights Metro Vancouver's successes and progress on the 2011 identified waste diversion measures; however, it also illustrates the need to update the actions to better capture the gaps in our measures. We recently commented on the Province's Preventing Single-Use and Plastic Waste in British Columbia intentions paper and hope that Metro Vancouver can capitalize on some of the actions identified by the province in the ISWRMP's update. We observed many synergies between the strategies and look forward to seeing and participating in the next steps of the ISWRMP update.

Regards,

Randy Ash
Regional Manager, Health Protection

Solid Waste Services
Tel. 604 432-6400 Fax 604 451-6180

July 26, 2022

File: CP-02-01

Randy Ash
Regional Manager, Health Protection
Vancouver Coast Health
#1200-1 601 West Broadway
Vancouver, BC V5Z RC2

Via email: Brooklyn.Rocco@vch.ca

Dear Randy Ash,

Metro Vancouver's 2021 Integrated Solid Waste and Resource Management Plan Biennial Report

Thank you for your insightful feedback on the Integrated Solid Waste and Resource Management Plan Biennial Report. We greatly appreciate your time and consideration in evaluating the positive public health benefits of effective waste management practices including reduced greenhouse gas emissions and the prevention of improper and environmentally harmful disposal. We look forward to working together to continuously improve the region's waste management system to support a sustainable, livable region.

As noted in your response, properly developed metrics will be an important component of an updated solid waste management plan and will help us not only measure our progress, but to share and communicate information with the residents, businesses, and other levels of government. Sustainable waste management, reducing greenhouse gas emissions and transitioning to a circular economy are truly a group effort, and involvement from a variety of stakeholders will help ensure the next version of our solid waste management plan benefits the region for years to come. We encourage your feedback on the key topic areas noted in your response such as multi-family residential recycling, solid waste residuals management options, and prioritization of initiatives.

Please note that all the responses received will be considered as part of the process to update the solid waste management plan. All feedback will be reported to the Ministry of Environment & Climate Change Strategy and the Metro Vancouver Board. If you have not done so already, please subscribe to the Solid Waste Mailing List and tick the box 'Solid Waste Management Plan Update' to receive all notifications related to the plan update, including reports on input such as yours.

Sincerely,

Paul Henderson, P.Eng
General Manager, Solid Waste Services, Metro Vancouver
SD/PH/nvd

54189469

2021 Integrated Solid Waste & Resource Management Plan Biennial Report

Bill Anderson [redacted]

Tue 5/3/2022 8:16 PM

To: Metro Vancouver - Solid Waste <solidwasteoperations@metrovancouver.org>; Bill Anderson [redacted]

Hello Managers of the Solid Waste Programs for Metro Vancouver.
As a citizen of Metro since 1967 I have been a very strong supporter of creative and effective waste management and recycling programs.

I read through the 2021 Biennial report and would like a little more information if possible.
Since my visit to the Covanta WTE plant in Burnaby just before Covid hit -- I see a tremendous potential from using the most modern technology available to safely create energy from burning waste.

It appears all plans to build NEW WTE facilities have been stopped -- given the overriding goal of reducing dumping in landfills --- this completely baffles me. Can I please have the analysis (business case) that scuttled further development.

I would really like to see data on how much "dirty" plastics (not deemed acceptable for recycling are being sent to landfills. This is a magic fuel for WTE systems. I also have visited the transfer station in North Surrey and saw massive amounts of old wooden furniture being crushed and presumably shipped to landfill sites -- also another fabulous free fuel for a new Waste to Energy plant. Can someone explain why these resources are not being used now and turned into energy?

It seems that a new WTE facility in North Surrey could massively improve overall waste usage & recycling efforts?

Given that the WTE bottom ash has been used in concrete successfully -- isn't it a simple plan to make that product available to all local concrete plant operators as a filler material - and revenue source for Metro?

Is there a chart showing all local (Metro) recyclers and what their capacity and specialty areas are? As a citizen it is wonderful to sort materials into the blue bin -- but my confidence level would sky rocket if you had a video following each of the components of a blue bin load through LOCAL recycling processes -- along with data about the changing volumes used & market value of these raw materials as inputs to re manufacturing processes.
(for example -- I have no idea if there is full reuse of the various 8 levels of plastic products -- or if all glass and foam products are being efficiently recycled)

Thanks for your time and assistance.

Regards Bill Anderson
[redacted]

Re: 2021 Integrated Solid Waste & Resource Management Plan Biennial Report

Metro Vancouver - Solid Waste

Wed 5/11/2022 12:53 PM

To: Bill Anderson [redacted]

Bcc: Terry Fulton <Terry.Fulton@metrovancouver.org>;

Hi Bill,

Thank you for the insightful comments. I appreciate having the chance to discuss your questions and let you know about some of our important new initiatives such as the alternative fuel and recyclables recovery project and the waste-to-energy district energy project, both which will reduce greenhouse gas emissions in the region and realize the potential for recovering valuable resources from disposed material. Further to your question about recycling, to learn more about what happens with blue bin materials check out this link from RecycleBC: What Happens To My Recycling: A Closer Look » Recycle BC - Making a difference together.

As discussed when we spoke on the phone, we are in the process of updating our solid waste management plan. As part of that process will be looking at the best way to manage materials generated in the Metro Vancouver region. You can subscribe to our Solid Waste Mailing List (link below) to be notified of opportunities for input in the areas you're interested in. Tick the box 'Solid Waste Management Plan' to receive all notifications related to the plan input.
Solid Waste Mailing List (metrovancouver.org)

Please note that all the responses received, including your e-mail, will be considered as part of the process to update the solid waste management plan. All feedback will be reported to the Ministry of Environment & Climate Change Strategy and the Metro Vancouver Board.

Thanks again for your input, and feel free to contact me at the number below if you have any further questions.
Sincerely,

Terry Fulton, P.Eng. (he/him)
Senior Project Engineer, Zero Waste Implementation
Solid Waste Services
c. 604-313-0839
Metro Vancouver

2021 Integrated Solid Waste & Resource Management Plan Biennial Report

Elda Bolton. [redacted]

Wed 5/4/2022 5:01 PM

To: Metro Vancouver - Solid Waste <solidwasteoperations@metrovancouver.org>;

As long as there is never another incident of solid waste being dumped near residents , country or city . That Merritt dump of Vancouver solid waste was an embarrassment for us all and defending that practice was even worse . It was irresponsible and not forgotten

Re: 2021 Integrated Solid Waste & Resource Management Plan Biennial Report

Metro Vancouver - Solid Waste

Mon 5/9/2022 2:49 PM

To: Elda Bolton. [redacted]

Dear Ms. Bolton

Thank you for your feedback and ideas. All responses received will be considered as part of the process to update the solid waste management plan.

All feedback will be reported to the Ministry of Environment & Climate Change Strategy and the Metro Vancouver Board.

If you have not done so already, please subscribe to the Solid Waste Mailing List and tick the box 'Solid Waste Management Plan Update' to receive all notifications related to the plan update, including reports on input such as yours.

Thank you.

_____

2021 Integrated Solid Waste & Resource Management Plan Biennial Report

susan hyam [redacted]

Thu 5/5/2022 8:57 PM

To: Metro Vancouver - Solid Waste <solidwasteoperations@metrovancouver.org>; council@dnv.org <council@dnv.org>;

Here in the District of North Vancouver, there is now a 10 cent deposit on whole or reduced fat milk cartons, but not on cartons of buttermilk, cremo, whipping cream.
How ridiculous is this...?
What is the rationale behind limiting the return deposits on just MILK?

Yes, I recognize that persons on very limited incomes are probably not using a lot of cream, creamo, buttermilk, but even so, the deposits should be for all dairy products (animal sourced)...not almond or oat 'milks' that's another story

Reply please,
Susan Hyam
[redacted]

RE: 2021 Integrated Solid Waste & Resource Management Plan Biennial Report

Sophie Goodman <GoodmanS@dnv.org>

Fri 5/6/2022 2:36 PM

To: [redacted]

Cc: Metro Vancouver - Solid Waste <solidwasteoperations@metrovancouver.org>;

Hi Susan,

Thank you for your email. I am responding on behalf of the Solid Waste Department.

Deposit on “ready-to-drink” milk and plant-based beverages is a result of a Government of B.C. regulation change, implemented through the CleanBC Plastic Action Plan.

For questions on items exempted from the recycling regulation, please contact the Province at ExtendedProducerResponsibility@gov.bc.ca.

Kind regards,

Sophie

Sophie Goodman
Solid Waste Coordinator

DISTRICT OF NORTH VANCOUVER

2021 Integrated Solid Waste & Resource Management Plan Biennial Report

Wade Edwards [redacted]

Wed 5/4/2022 12:24 PM

To: Metro Vancouver - Solid Waste <solidwasteoperations@metrovancouver.org>;

Awesome job 👍. Keep up the great work 😀

Sent from Yahoo Mail for iPhone

Re: 2021 Integrated Solid Waste & Resource Management Plan Biennial Report

Metro Vancouver - Solid Waste

Mon 5/9/2022 2:48 PM

To: Wade Edwards [redacted]

Dear Mr. Edwards,

Thank you for your feedback and ideas. All responses received will be considered as part of the process to update the solid waste management plan.

All feedback will be reported to the Ministry of Environment & Climate Change Strategy and the Metro Vancouver Board.

If you have not done so already, please subscribe to the Solid Waste Mailing List and tick the box 'Solid Waste Management Plan Update' to receive all notifications related to the plan update, including reports on input such as yours.

Thank you.

To: Zero Waste Committee

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

Date: August 31, 2022 Meeting Date: September 9, 2022

Subject: **Waste-to-Energy Facility Environmental Monitoring and Reporting 2021 Update**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated August 31, 2022, titled "Waste-to-Energy Facility Environmental Monitoring and Reporting 2021 Update."

EXECUTIVE SUMMARY

This report provides the annual overview of the Waste-to-Energy environmental performance for 2021. All air emission related parameters monitored during 2021 were in compliance with the Waste-to-Energy Facility Provincial Operational Certificate. The 2021 emissions were similar to 2020 emissions and continue to be well below regulatory limits. Metal emissions are less than 5% of regulatory limits. Dioxins/furans and trace organics are less than 3% of regulatory limits, with the exception of chlorobenzenes being 31% of the regulatory limit. Nitrogen oxides and fine particulate emissions represent 0.5% and 0.01% of regional totals, and are 68% and 12% of regulatory limits. The Waste-to-Energy Facility accounts for less than 1% of regional greenhouse gas emissions.

In the fall of 2020, Metro Vancouver began monitoring ambient air parameter concentrations at a temporary air monitoring station immediately adjacent to the Waste-to-Energy Facility, and installed additional monitoring equipment at an existing monitoring station. Results from the program show sulphur dioxide and hydrogen chloride ambient levels at less than 10% of ambient air standards at both stations.

PURPOSE

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

BACKGROUND

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

This report provides updates on the facility's 2021 environmental performance and the implementation of the Waste-to-Energy Facility Provincial Operational Certificate requirements. The report is identified in the Zero Waste Committee annual work plan and as such is being brought forward at this time.

ENVIRONMENTAL MONITORING AND REPORTING UPDATE

Since the Waste-to-Energy Facility opened in 1988, Metro Vancouver has striven to continually reduce emissions through assessment, operational and plant infrastructure improvements, and environmental controls. All air emission related parameters monitored during 2021 were in compliance with the requirements of Operational Certificate 107051. A summary of historic annual emission performance, including 2021 data, is attached.

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

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

Environmental Monitoring Program

The 2021 Waste-to-Energy Facility environmental monitoring program consisted of the following:

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

- Air Emissions Monitoring – Periodic Manual Stack Testing:
    - Triplicate tests are conducted four times per year on each of the three plant lines to measure particulate matter, trace metals, and hydrogen fluoride.
    - A single test is conducted annually on one boiler (rotating between boilers each year) in triplicate to monitor for semi-volatile organic compounds, including dioxins and furans, chlorobenzenes, chlorophenols, polychlorinated biphenyls, and polycyclic aromatic hydrocarbons.

- Fly and Bottom Ash Monitoring:
    - Each fly ash load is tested prior to transport and disposal.
    - Bottom ash samples are collected from each truck loaded with bottom ash for transport and disposal. Samples are combined to form a weekly composite sample for analysis.
    - On May 20, 2021, the Ministry of Environment and Climate Change Strategy approved Metro Vancouver's 2020 Bottom Ash Management Plan. The 2020 Plan allows for the potential beneficial use of bottom ash that has been processed through the Waste-to-Energy Facility's non-ferrous metal recovery system at cement plants. Metro Vancouver has contracted with Birco Environmental Services to conduct a pilot test in support of the beneficial use of bottom ash.

Comparison with Regulatory Limits

Table 1 and Attachment 1 show comparisons for various emission parameters with regulatory limits. Overall, the Metro Vancouver Waste-to-Energy Facility operates well within environmental standards.

Table 1: 2021 Emissions Summary Table

Parameter (Average Values)	Units	Regulatory Levels	2021 Emissions Data	Percentage of Limit
Manual Stack Tests				
Particulate Matter	mg/dscm	9	1.1	12%
Hydrogen Fluoride (HF)	mg/dscm	1	0.01	1%
Sum of Lead, Arsenic, and Chromium	ug/dscm	64.0	3.3	5%
Cadmium (Cd)	ug/dscm	7.0	0.2	3%
Mercury (Hg)	ug/dscm	20.0	0.9	5%
Trace Organics Tests				
Dioxins/Furans (PCDD/PCDF)	ng/dscm	0.08	0.0022	3%

Chlorophenols	ug/dscm	1	0.0061	1%
Chlorobenzenes	ug/dscm	1	0.31	31%
Polycyclic Aromatic Hydrocarbons (PAHs)	ug/dscm	5	0.10	2%
Polychlorinated Biphenyls (PCBs)	ug/dscm	1	0.01	1%
Continuous Emissions Monitoring System:				
Nitrogen Oxides (NOx)		190	130	68%
Carbon Monoxide (CO)		50	26	51%
Sulphur Dioxide (SO_2)		200	72	36%

Operational Certificate Implementation and Ambient Air Monitoring

On December 3, 2020, the Metro Vancouver Waste-to-Energy Facility Operational Certificate was amended to defer the reduction in discharge limits for hydrogen chloride and sulphur dioxide from December 31, 2022 to March 3, 2025. Dispersion modelling submitted to the Ministry of Environment and Climate Change Strategy in December 2018 indicated that with current emission and operational certificate permitted levels, maximum ambient air concentrations of hydrogen chloride and sulphur dioxide are not expected to exceed ambient air criteria. The extension allows for additional ambient air monitoring to confirm concentration levels.

In the fall of 2020, Metro Vancouver installed an air quality monitoring station in the northwest corner of the Waste-to-Energy Facility site, which is near the location with the highest expected concentrations identified by the dispersion modelling. The station continuously measures hydrogen chloride, sulphur dioxide and nitrogen dioxide.

Metro Vancouver's existing Burnaby South air quality monitoring station was put in place in advance of the development of the Waste-to-Energy Facility with the goal of monitoring for any potential impacts of the Waste-to-Energy Facility on air quality. The instrumentation at the station, which already includes sulphur dioxide and nitrogen dioxide monitoring, was upgraded in the fall of 2020 with the addition of a hydrogen chloride monitor.

Monitoring data will be collected for a minimum of two years, and the data will be used to compare ambient concentrations to dispersion modelling results and ambient air quality objectives. Metro Vancouver has engaged a consultant to evaluate the data for reporting to the Ministry of Environment and Climate Change Strategy. Hydrogen chloride, sulphur dioxide, and nitrogen dioxide data collected from both monitoring stations has been posted monthly on the Metro Vancouver website since December 2020.

Data collected to date (Attachment 2) shows ambient air concentrations of hydrogen chloride and sulphur dioxide at the Waste-to-Energy Facility monitoring station are less than 6% of ambient air quality objectives, and well below modelling results. Ambient air concentrations of hydrogen chloride and sulphur dioxide measured at the Burnaby South monitoring station are less then 7% of ambient air quality objectives. A diurnal pattern in hydrogen chloride has been noted during the summer

months, however analysis has demonstrated it is not related to operations of the Waste-to-Energy Facility.

Nitrogen oxide levels are within ambient air quality objectives and lower than many other monitoring stations within the region. The primary contributor to ambient nitrogen oxides throughout the region is automobile exhaust. One of the objectives of the consulting study will be determining the relative contribution of the Waste-to-Energy Facility to nitrogen oxide levels in the vicinity of the Waste-to-Energy Facility. In 2021, Metro Vancouver installed a meteorological station on the roof of the Waste-to-Energy Facility to improve accuracy of dispersion modelling.

Greenhouse Gas Emissions Reporting

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

Greenhouse gas emissions from the Waste-to-Energy Facility are comprised mainly of carbon dioxide with trace amounts of methane and nitrous oxides. 2021 greenhouse gas emissions were verified by PwC Canada, and reported to the provincial and federal governments. Non-biogenic emissions from the facility were 135,390 tonnes carbon dioxide equivalents, a 3% decrease from 2020. Overall greenhouse gas emissions from the facility, including both non-biogenic and biogenic, were 311,077 tonnes carbon dioxide equivalents, an increase of approximately 5% compared to 2020. This increase is primarily due a change in the composition of the waste stream and increased use of natural gas to meet the response limit requirements of the Operational Certificate. Over the past three years, the non-biogenic portion of greenhouse gas emissions has ranged from 40% to 47%. In 2021 it was 43%. As in past reporting years, the Waste-to-Energy Facility accounted for less than 1% of all anthropogenic greenhouse gas emissions in the region.

National Pollutant Release Inventory Reporting

The National Pollutant Release Inventory is Canada's legislated, publicly accessible inventory of pollutant releases to air, water and land, as well as from disposal and transfer for recycling. The National Pollutant Release Inventory is managed by Environment and Climate Change Canada and currently tracks over 300 substances and groups of substances. Metro Vancouver is required to report air emissions (e.g., particulate matter, metals, organic compounds, and acid gases) and substances transported for off-site disposal, including fly ash and bottom ash for the preceding calendar year to the National Pollutant Release Inventory. Table 2 summarizes the information which has been reported to the National Pollutant Release Inventory.

Table 2: 2021 National Pollutant Release Inventory Substance Reporting Summary

	Reported Quantity (tonnes)	
Substance	**Stack Emissions**	**Ash Disposal**
Nitrogen Oxides	248	N/A
Carbon Monoxide	54	N/A
Sulphur Dioxide	139	N/A
Hydrogen Chloride/Hydrochloric Acid	90.8	N/A
Aluminum (dust)	0.018	N/A
Arsenic	0.00068	1.51
Cadmium	0.00019	1.54
Cobalt	0.0002	1.85
Copper	0.0012	96.9
Lead	0.0031	28.0
Manganese	0.00098	28.6
Mercury	0.0016	0.062
Phosphorus	0.0068	587.0
Zinc	0.012	230.0
Particulate Matter ≤ 10µm	1.23	N/A
Particulate Matter ≤ 2.5µm	0.98	N/A
Dioxins and Furans	N/A	N/A
Hexachlorobenzene	N/A	N/A

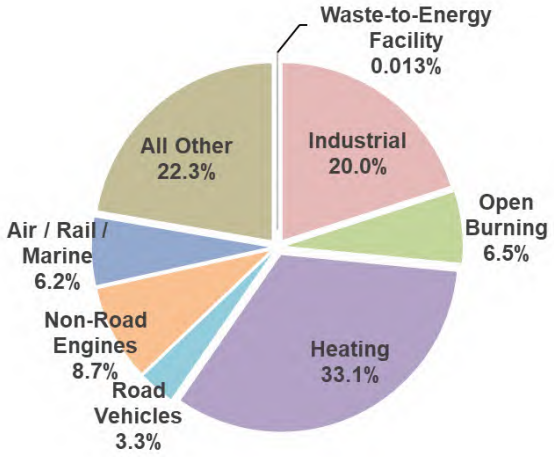
Notes: - All other substances are below the National Pollutant Release Inventory level of quantification and are not required to be reported.
- 'N/A' indicates value is either below the level of quantification, below the detection limit, or the substance is not found in ash.

Waste-to-Energy Facility in a Regional Context

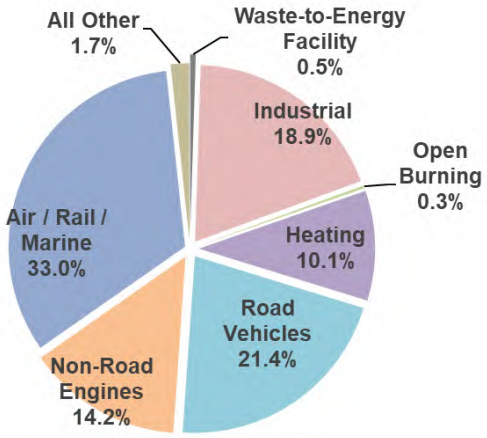
Figure 1 compares Waste-to-Energy Facility emissions to total emissions from all regional sources for two key air contaminants in the Lower Fraser Valley – fine particulate matter and nitrogen oxides (a key smog forming pollutant). In 2021, the Waste-to-Energy Facility accounted for 0.01% of regional fine particulate matter emissions and 0.5% of regional nitrogen oxide emissions. The Nitrogen Oxide Reduction Project, completed in October 2014, reduced nitrogen oxide emissions from 0.9% of the regional total in 2013 to 0.5% in 2021.

Figure 1: Regional Emissions Distribution (2021) – Fine Particulate Matter and Nitrogen Oxides

2021 Lower Fraser Valley Fine Particulate Matter Emission Sources



2021 Lower Fraser Valley Nitrogen Oxide Emission Sources



Comparison to Previous Year

Historic environmental performance data is included in Attachment 1. Environmental performance for the Waste-to-Energy Facility for 2021 was similar to 2020. Fine particulates and metals emissions showed some variability between the two years, but all continue to be well within regulatory limits.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

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

CONCLUSION

The Waste-to-Energy Facility operates well within environmental standards and regulatory limits. A range of projects that continuously improve the facility's environmental performance have been completed or are underway. All air emission related parameters monitored during 2021 were in compliance with Operational Certificate 107051. Continuous emissions monitoring data and all compliance reports are available on the Metro Vancouver website.

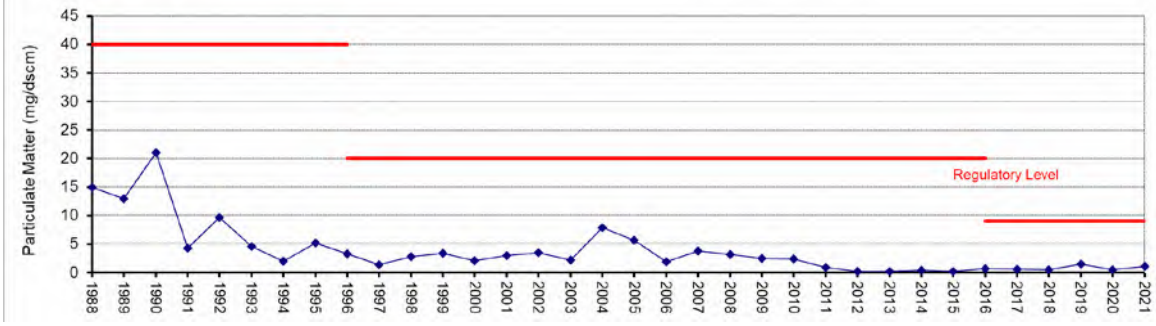
Attachments

1. Metro Vancouver Waste-to-Energy Facility Summary of Air Emissions 1988-2021
2. Metro Vancouver Waste-to-Energy Facility 2021 Ambient Air Quality Report

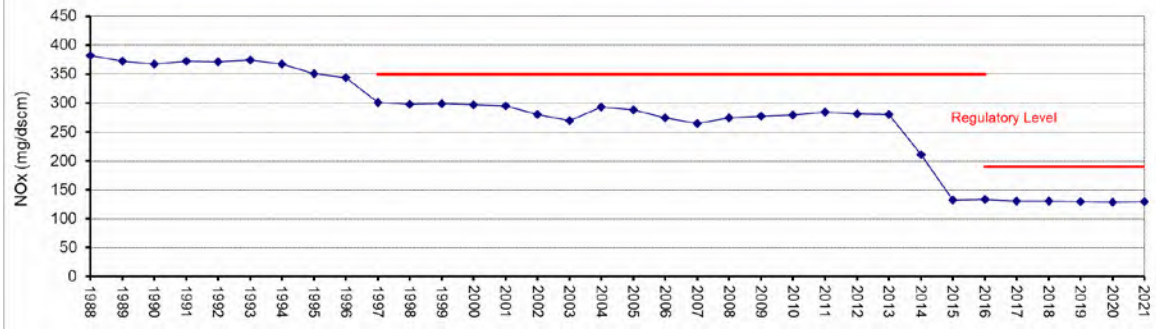
49473492

Metro Vancouver Waste-to-Energy Facility Summary of Air Emissions 1988-2021

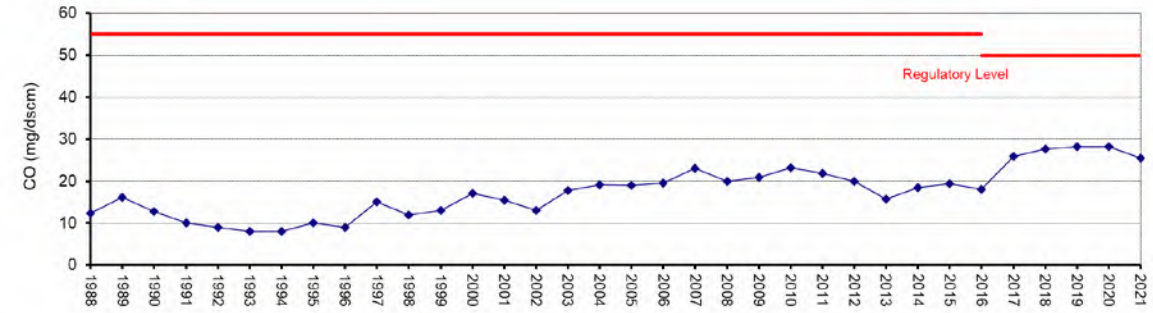
Particulate Matter



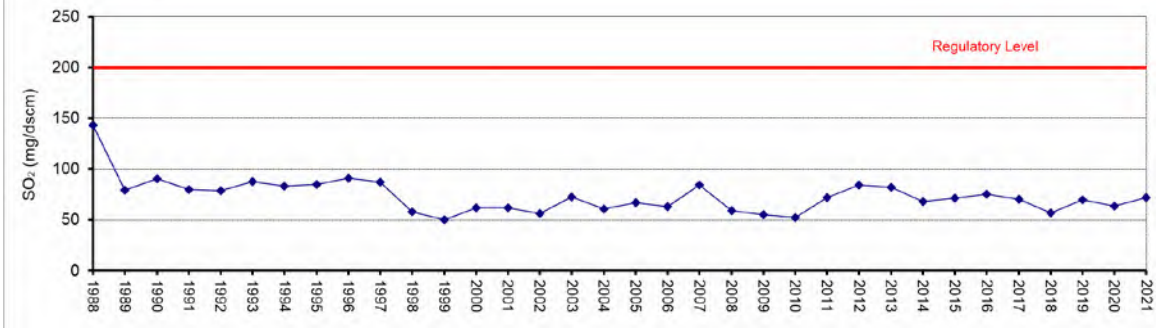
Nitrogen Oxides



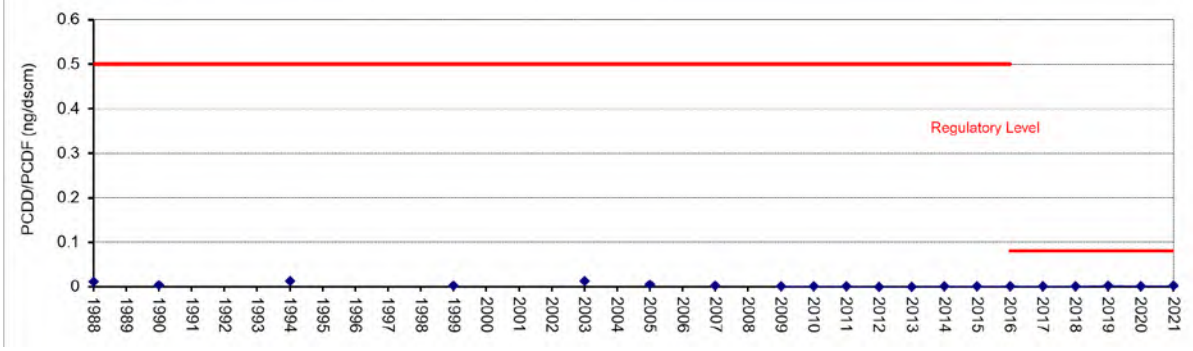
Carbon Monoxide



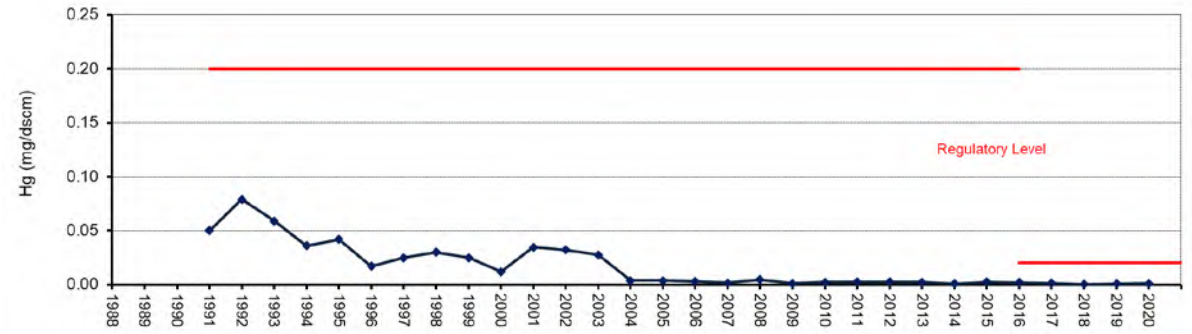
Sulfur Dioxide



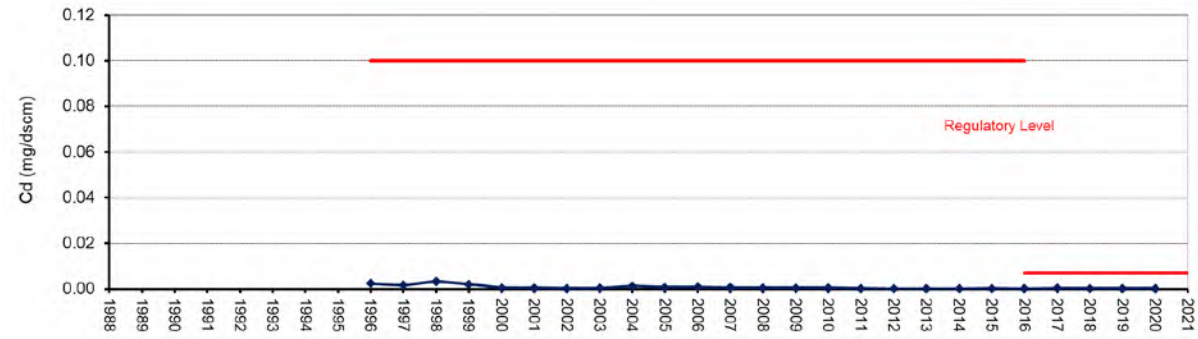
Dioxins/Furans



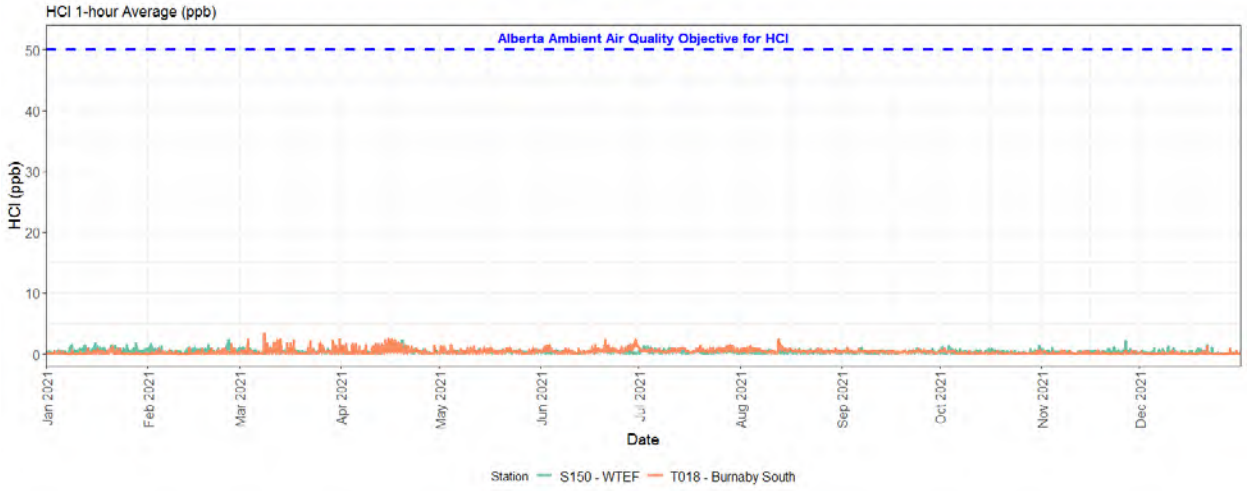
Mercury

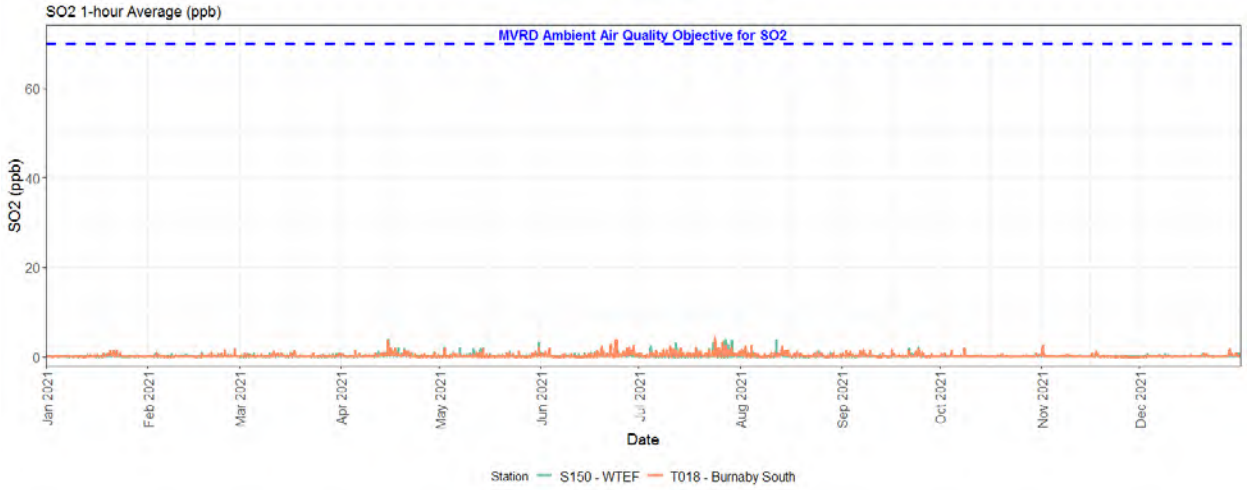


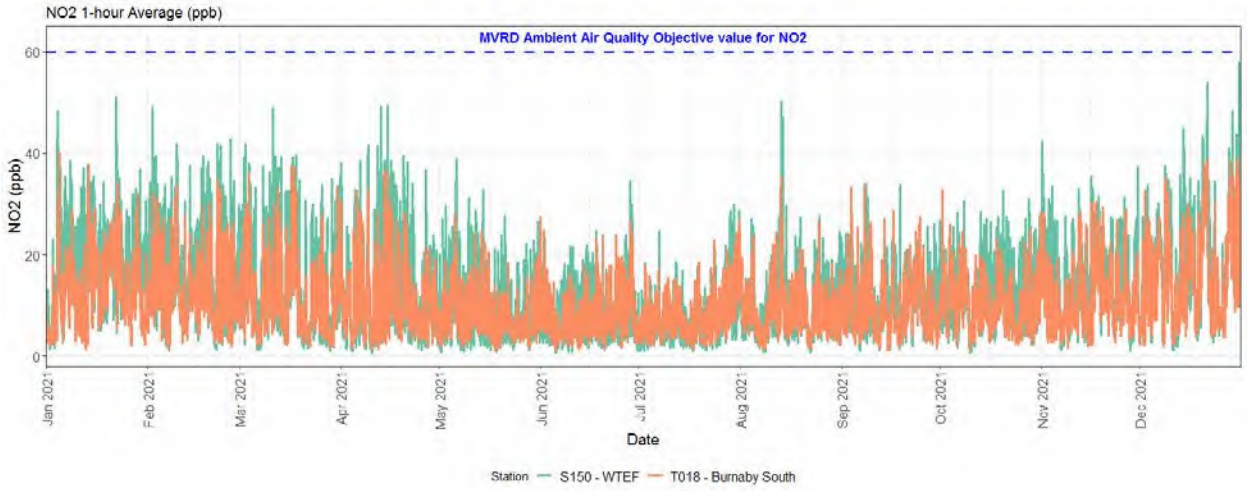
Cadmium



Metro Vancouver Waste-to-Energy Facility 2021 Ambient Air Quality Report







To: Zero Waste Committee

From: Adriana Velázquez, Senior Project Engineer, Solid Waste Services
John Ho, Project Engineer, Solid Waste Services

Date: August 31, 2022 Meeting Date: September 9, 2022

Subject: **Illegal Dumping and Gypsum Management Update**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated August 31, 2022, titled "Illegal Dumping and Gypsum Management Update".

EXECUTIVE SUMMARY

In 2021, member jurisdictions reported 42,450 illegal dumping incidents, compared to 47,050 in 2020. While overall incidents decreased, incidents of abandoned gypsum increased to 964 from 720 in 2020. Member jurisdictions' collective cost of cleaning up illegally dumped material is estimated to be $3.5 million, down slightly from $3.6 million in 2020. The average cost per incident across the region has remained relatively stable for the past five years. In addition to illegal dumping clean-up, it is estimated municipalities spent $2.5 million per year on large item pick-up programs, which are in place to help prevent illegal dumping.

Metro Vancouver provides programs and education to reduce illegal dumping, including accepting residential loads of new gypsum for recycling and used gypsum for disposal at all recycling and waste centres. A behavior change campaign, Waste in Its Place, focuses on addressing the most commonly abandoned items. Metro Vancouver will continue to work with member jurisdiction staff and other stakeholders on initiatives to help reduce illegal dumping.

PURPOSE

To provide the Zero Waste Committee an update on regional illegal dumping and gypsum management trends, costs, and programs.

BACKGROUND

Staff provided an illegal dumping report to the Zero Waste Committee in September 2021 which identified that the illegal dumping of gypsum materials continues to be a challenging and costly issue for municipalities. This report provides an update on illegal dumping statistics and programs for 2021.

ILLEGAL DUMPING AND ABANDONED GYPSUM TRENDS

Key trends are summarized as follows:

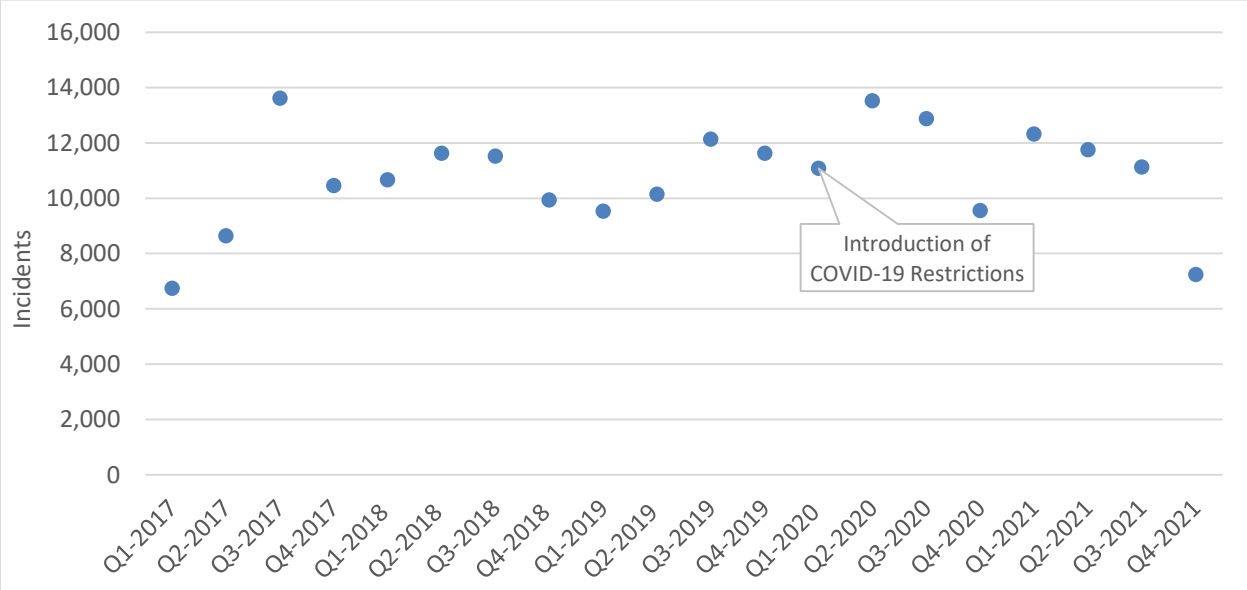
- In 2021 member jurisdictions reported 42,450 illegal dumping incidents, including 964 incidents of abandoned gypsum (Table 1), at a collective cost estimated to be $3.5 million.
- The average cost per incident across the region has relatively remained stable for the past five years.

- Municipalities collectively spent $2.5 million per year on large item pick-up programs over the past five years.
- In March 2020, the number of illegal dumping incidents decreased temporarily, coinciding with the onset of the COVID-19 restrictions, then increased in the summer of 2020 and stabilized throughout 2021 (Figure 1).

Table 1: Annual Incidents of Illegal Dumping and Abandoned Gypsum in Metro Vancouver

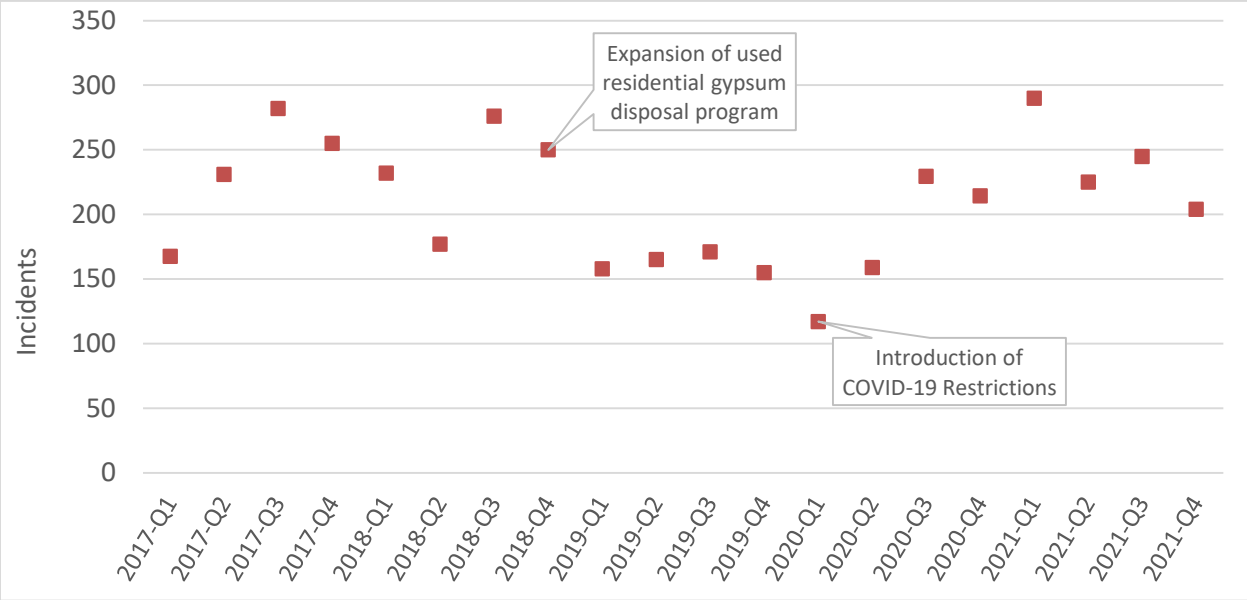
Year	Total Number of Illegal Dumping Incidents	Number of Abandoned Gypsum Incidents	Total Cost of Clean Up	Average Cost Per Incident
2016	37,000	628	$2.51 million	$68
2017	39,500	936	$3.16 million	$80
2018	43,800	935	$3.40 million	$78
2019	43,450	649	$3.50 million	$81
2020	47,050	720	$3.63 million	$77
2021	42,450	964	$3.54 million	$83

Figure 1: Illegal Dumping in Metro Vancouver



Illegally-dumped gypsum is problematic as it may contain asbestos. Asbestos-containing materials represent a health risk to workers and the general public, and are expensive to remediate and dispose of. From 2018 to 2019 abandoned gypsum incidents decreased approximately 31%. This decrease coincided with the expansion of the used gypsum program to all Metro Vancouver recycling and waste centres and the Vancouver Landfill in late 2018 (Figure 2). Some municipalities reported a noticeable increase in dumping of construction material from 2019 to 2021, bringing the number of incidents back to 2017 levels.

Figure 2: Abandoned gypsum in Metro Vancouver



Waste in Its Place Campaign

Metro Vancouver's Waste in its Place campaign targets abandoned waste and illegal dumping and is now in its sixth year. The campaign objectives are to reduce instances of illegal dumping across the region and increase the likelihood of residents disposing of waste responsibly. Based on member jurisdictions' feedback and data of commonly dumped items, focus areas have included gypsum, furniture, mattresses, construction and demolition material, yard waste and household garbage.

WASTE GYPSUM MANAGEMENT: RECYCLING AND DISPOSAL

Waste gypsum is one of the most challenging materials to handle in the construction and demolition sector. New gypsum off cuts, collected separately, can often be recycled into new drywall. However, used gypsum may contain asbestos; therefore, it can negatively affect public and environmental health, and lead to contamination of readily recyclable construction materials. To manage this challenging material Metro Vancouver and member jurisdictions have several programs and policies aimed at recycling and responsible disposal of gypsum. These programs are described below.

Metro Vancouver Disposal Ban Program

The disposal ban program helps keep readily recyclable materials and materials that pose operational risks and are hazardous out of the waste stream. Garbage loads received at regional solid waste facilities are visually inspected for banned materials, and surcharges are applied if banned materials are present. In 2021, loads containing gypsum accounted for 4% of the total surcharge notices. The proportion of loads surcharged for gypsum remained stable in 2021 compared to the prior two years.

Table 2: Proportion of Loads Surcharged for Gypsum at Regional Solid Waste Facilities

Year	Percentage
2018	10%
2019	4%
2020	3%
2021	4%

2022 Waste Composition Study Results

Despite being banned from garbage, small quantities of gypsum are often identified during the sorting of mixed loads of construction and demolition material. The 2021 full-scale waste composition study (Reference 1) analyzed the waste stream across all sectors (single-family, multi-family, commercial/institutional and small loads) and various material categories. Building materials were analyzed as part of the program and results identified gypsum comprised 0.5% by weight of the overall waste stream in Metro Vancouver (Table 3). Gypsum in the waste stream was lower compared to previous years (Table 3).

Table 3: Gypsum Composition in the Waste Stream

Year	Percentage
2015	1.2%
2016	3.0%
2018	0.5%
2020	1.7%
2021	0.5%

Residential Used Gypsum Disposal Program

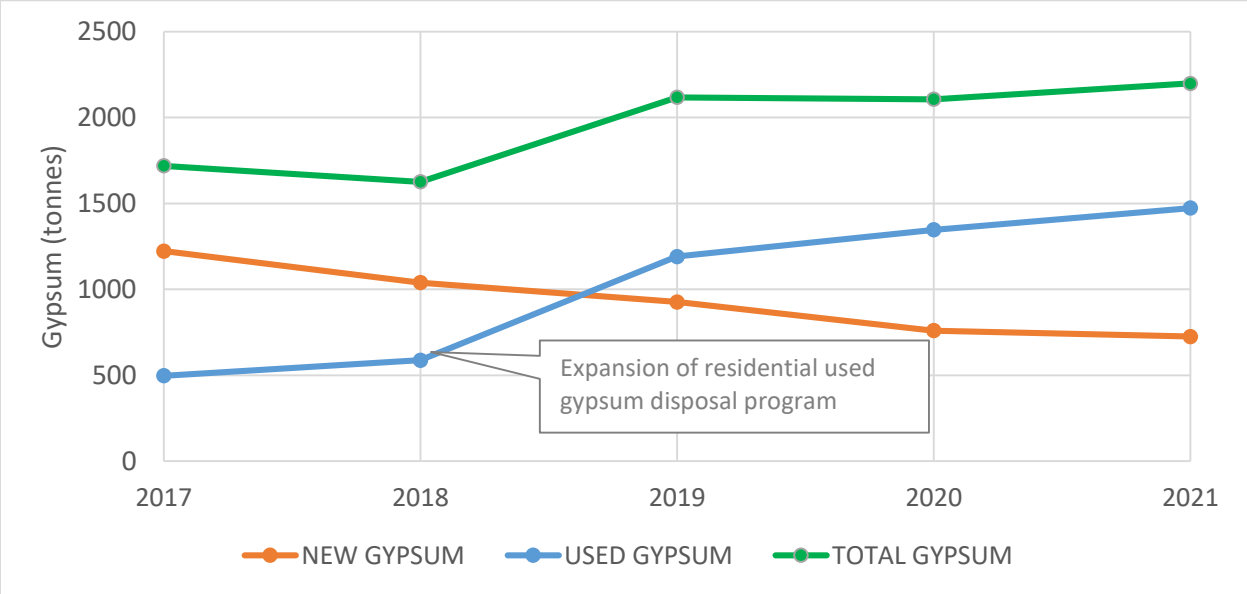
Used gypsum is gypsum that has been previously installed during the construction of a building. Gypsum installed before 1990 may be contaminated with asbestos in the tape and mud, and requires testing, special handling, and disposal which can be challenging for residents completing small do-it-yourself home improvements. In an effort to reduce illegal dumping within municipalities and incidents of gypsum hidden in garbage, Metro Vancouver launched a residential used gypsum disposal program in September 2016. The program's goal is to provide residents with a direct, safe disposal option for used gypsum without having it tested for asbestos. The residential used gypsum disposal program is intended for residential homeowners performing small-scale home renovations as there are other well established, independent disposal options for contractors or residents undertaking large home renovation projects.

The program was piloted in the fall of 2016 at the Langley and Maple Ridge recycling and waste centres and was later expanded to all Metro Vancouver recycling and waste centres, and the Vancouver Landfill in late 2018. Residents can drop off up to 10 bags at 10 kg maximum per bag of used gypsum per visit, and are allowed up to five visits per year at a fee of $200 per tonne. The used gypsum must be double-bagged and sealed in special clear "used gypsum program" bags, which are

available at many home improvement retailers. A video on the program is available on the Metro Vancouver website (Reference 2). Used gypsum received at Metro Vancouver's recycling and waste centres is sent for safe disposal.

To date, approximately 5,900 tonnes have been collected and the program is now averaging approximately 140 tonnes (roughly 14,000 bags) per month. Figure 3 illustrates the trend of gypsum tonnages collected at all Metro Vancouver facilities. Note there is a significant increase in tonnages of used gypsum starting in 2018-Q4 which coincides with the used gypsum program being expanded to all Metro Vancouver recycling and waste centres. Additionally, there is another significant increase starting in 2020-Q1 which is when COVID-19 restrictions and isolation requirements were implemented province-wide.

Figure 3: Gypsum Collected at all Metro Vancouver facilities



Residential New Gypsum Recycling Program

New gypsum date-stamped 1990 or newer that has never been installed is accepted for recycling at all Metro Vancouver recycling and waste centres and the Vancouver Landfill. New gypsum does not need to be bagged. Residents can drop off up to 500 kg per load of new gypsum at a fee of $150 per tonne. New gypsum is collected in a separate bin and sent to a private facility for recycling.

Since 2016-Q3, approximately 5,700 tonnes have been collected at Metro Vancouver facilities and the program is now averaging approximately 65 tonnes per month. Note that these tonnages do not capture the residents and contractors that bring their new gypsum directly to private facilities for recycling. Figure 3 illustrates the trend for new gypsum tonnages collected at all Metro Vancouver facilities.

Private facilities primarily manage recyclables from the commercial/institutional and construction and demolition sectors, including gypsum. In 2020, approximately 56,800 tonnes of gypsum were collected for recycling in the Metro Vancouver region (Table 4).

Table 4: Recycled Gypsum in Metro Vancouver

Year	Recycled Gypsum Tonnes
2016	49,485
2017	57,060
2018	55,863
2019	62,904
2020	56,782

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Metro Vancouver's initiatives related to illegal dumping monitoring, reporting, and education are carried out within existing budgets for Solid Waste Services and External Relations. Illegal dumping clean-up costs are borne by member jurisdictions and private land owners.

The new and used gypsum programs at Metro Vancouver recycling and waste centres are funded through tipping fees and are included in the solid waste services annual budget.

The waste composition program is ongoing and is included in the solid waste services annual operating budget.

CONCLUSION

Metro Vancouver and member jurisdiction's initiatives to reduce illegal dumping appear to have been successful in reducing abandoned waste overall, but abandoned gypsum continues to be a problem. Incidents of abandoned gypsum and construction material have increased since the onset of the pandemic. While the disposal ban program, new gypsum recycling and used gypsum disposal programs remain effective tools to encourage proper management of gypsum waste, collaboration with member jurisdictions and industry stakeholders is necessary to further address the increases in abandoned gypsum in the region.

References

1. Full-scale waste composition study
2. How to dispose of used gypsum

53146327

To: Liquid Waste Committee

From: Larina Lopez, Division Manager, Corporate Communications
Carol Nicolls, Communications Specialist, Corporate Communications

Date: July 26, 2022 Meeting Date: September 21, 2022

Subject: **2022 Unflushables Campaign Results**

RECOMMENDATION

That the Liquid Waste Committee receive for information the report dated July 26, 2022, titled "2022 Unflushables Campaign Results".

EXECUTIVE SUMMARY

The 2022 Unflushables campaign ran from April 4 to June 12. The campaign's objective is to reduce the disposal of problem items into the wastewater system. The campaign targets seven key items, with extra focus on wipes and medications, and is aimed at adults aged 25 to 54. The media strategy included social media, television, radio, Google Search, and placements in elevators, restobars, and on bus sides. The campaign performed well, generating 27 million impressions, 2.3 million video views, 648 engagements, 6,948 website visits and reaching 800,000 people. The number of de-ragging incidents has generally dropped since 2017, from 121 to 37 in 2021, but are projected to increase to 60 in 2022. It can be difficult to attribute annual fluctuations to a specific cause. Metro Vancouver continues to work with the Health Products Stewardship Association to leverage joint opportunities to promote the medications take-back program. The campaign will run again in 2023.

PURPOSE

To update the Committee on the results of the 2022 regional Unflushables campaign.

BACKGROUND

The incorrect disposal of wipes and other items into the sewer system costs the region at least $2 million every year. The Unflushables campaign, now in its sixth year, asks residents to correctly dispose of seven priority items that cause problems when put into the wastewater system. The campaign supports the source control objectives of the Integrated Liquid Waste and Resource Management Plan. This report provides an update on the results of the 2022 campaign as identified in the 2022 Liquid Waste Committee Work Plan.

2022 REGIONAL UNFLUSHABLES CAMPAIGN

The 2022 Unflushables campaign was in market from April 4 to June 12. The campaign asked residents to correctly dispose of seven items that should not be flushed: wipes, paper towels, floss, hair, condoms, tampons and applicators, and medications. Medications are difficult for wastewater treatment plants to fully remove and can end up in the environment, while the other items contribute to sewer clogs and overflows. Residents were asked to return medications to a pharmacy and put the other items in the garbage.

Media Strategy

The media strategy targeted adults 25–54, skewing slightly towards women as the main purchasers of many of the products addressed in the campaign, and putting extra focus on wipes and medications. The media buy leveraged both broad and targeted tactics and included digital (YouTube, Facebook, Instagram, TikTok, Google Search), broadcast (geo-targeted television PSA, radio, and out-of-home advertising on bus sides, elevator screens in multi-family buildings and screens in restobars). All the placements directed to the campaign website.

Engagement of Metro Vancouver Members

Campaign details and creative materials were shared with members' communication staff prior to the campaign's launch. All materials were made available for download on the Metro Vancouver website, and custom, co-branded materials were created upon request. The media buy included spots in all member jurisdictions, ensuring that the campaign ads appeared across the region. Some members shared the campaign on their social media platforms or at events. Campaign creative was also used by one city outside of the region.

Results

Media Performance

- The campaign delivered almost 27 million impressions, which is significantly higher than last year. This increase was likely generated by a larger amount of out-of-home placements.
- Broad, traditional tactics delivered the majority of impressions, with just under 17 million impressions across advertising on bus sides, radio, television, and elevator and restobar screens. The television PSA aired 1,812 times.
- Targeted digital tactics delivered 7.7 million impressions across social media, YouTube, and Google Search, with a reach of almost 800,000.
- There were just under 2.3 million video views on social media. YouTube view rates increased by 18% over 2021, showing that the shorter, refreshed content resonated with the target audience.
- Radio received 1.8 million impressions (441 spots). An estimated 355,000 people heard the Unflushables quiz ads, which aired on two radio stations.

Social Media

- Social media placements reached almost 800,000 people and generated 648 engagements (likes, comments and shares).

Website Traffic

- Over the campaign period, there were 6,948 page views, which is 101 per day. This is slightly lower than previous years, likely because more elements of this year's media buy—particularly YouTube and out-of-home placements—were more oriented towards awareness than driving traffic to the website.
- Of the many channels used, TikTok, Facebook, and Google Search were among the top channels that brought people to the website.

Impacts of Wipes and other Unflushable Items on the Wastewater System

As shown in Table 1 below, Metro Vancouver continues to track the number of pump station clogs that require de-ragging by operations staff. These records show that the long-term trend in the number of re-ragging events at Metro Vancouver pump stations has generally been downwards. However, there are fluctuations in the number of events from time to time that cannot be readily explained. A number of factors contribute to clogs, including unflushable items and grease, making it difficult to measure the specific impact of unflushable items on the wastewater system. The number of clogs should be considered as only one of the indicators used to assess campaign effectiveness.

Table 1. De-ragging Events in Metro Vancouver Pump Stations

Year	Events
2016	53
2017	121
2018	58
2019	34
2020	35
2021	37
2022	34 as of June 30; 60 projected to year end

Metro Vancouver staff continue to work with member jurisdictions to track the collective impacts of wipes and other unflushable items, including clogs, damaged equipment, impacts of sewer overflows and the associated maintenance costs of these impacts. There are also ongoing efforts to collaborate through the Canadian Water and Wastewater Association to develop initiatives to further prevent improper disposal of unflushable items into wastewater systems. Metro Vancouver is also collaborating with the Health Products Stewardship Association to leverage joint messaging opportunities the medications return program.

Plans for 2023 Campaign

The campaign will run again in 2023, likely with the same timing, focus, and creative materials. As the campaign heads into its seventh year, it will be important to continue to look for ways to refresh the creative materials. Metro Vancouver will continue to work with the Health Products Stewardship Association to leverage joint opportunities to promote the medications return program within the region. The campaign mascots (Pee and Poo) were used at Metro Vancouver's PNE activation in 2022, but there is also demand for them at municipal events. Use of mascots at events is resource intensive and the feasibility of using them at municipal events will be assessed for 2023. A post-campaign survey will be conducted in 2023 to help assess campaign impact.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The 2022 Unflushables campaign had a budget of $150,000, supported under the Liquid Waste Communications Program of the 2022 General Government Budget.

CONCLUSION

The Unflushables campaign aims to reduce the disposal of problem items into the wastewater system and focuses on seven key items that should not be flushed. The campaign ran from April 4 to June 12 and targeted adults aged 25–54. The campaign performed well, generating 27 million impressions, 2.3 million video views, 648 engagements, 6,948 website visits and reaching 800,000 people. In general, de-ragging incidents at pump stations have decreased, dropping from 121 events (2017) to 37 events (2021), but with a projected increase for 2022. A number of factors influence this outcome. Metro Vancouver continues to work with the Health Products Stewardship Association to leverage joint opportunities to promote the medications take-back program. The campaign will run again in 2023 and will include a post-campaign awareness survey.

Attachment

Sample of Campaign Materials

Reference

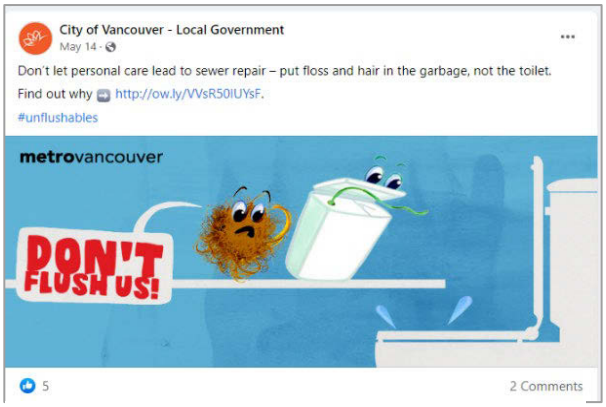
Unflushables Campaign Website

49473939

Sample of Campaign Materials

Bus kings on various routes throughout the region

Digital posters in elevators and restaurants



Social media posts