
To: Liquid Waste Committee

From: Larina Lopez, Division Manager, Corporate Communications, External Relations
Carol Nicolls, Communications Specialist, Corporate Communications, External Relations
Shellee Ritzman, Policy Coordinator, Corporate Communications, External Relations

Date: August 30, 2021 Meeting Date: September 9, 2021

Subject: **Regional Microfibres Reduction Campaign Launch**

RECOMMENDATION

That the Liquid Waste Committee receive for information the report dated August 30, 2021, titled “Regional Microfibres Reduction Campaign Launch.”

EXECUTIVE SUMMARY

Microfibres from laundry are one of the largest sources of microplastics pollution in the ocean. Research has shown that washing in cold water can reduce the microfibres associated with laundry. A regional microfibres reduction campaign will run September 13 – October 31, 2021, with the objective to lower the amount of microfibres released into the aquatic environment when clothes are washed. The campaign targets residents, specifically parents with children under 18, and asks them to reduce microfibre shedding through the small act of washing laundry in cold water. Pre-campaign research showed that while there is high awareness of microplastics issues, people were generally unaware of microfibre impacts but were open to taking an action that fit into their current routine. The campaign’s creative theme — “The Environment Thanks You” — features marine animals thanking people for switching to cold. The media strategy includes YouTube, Facebook, Instagram, television, digital billboards and Google adwords.

PURPOSE

To update the Committee on the launch of the new regional microfibres reduction campaign.

BACKGROUND

The impact of microplastics on the environment is a growing worldwide concern. Microplastics include microfibres, which are tiny fibre pieces – less than 5 mm in size and smaller than a human hair – that are shed from fabrics when they are washed. Both synthetic and natural materials (like cotton) produce microfibres. Not all microfibres can be removed through wastewater treatment and some end up in the ocean, where they can be harmful to fish and other aquatic life. Synthetic microfibres from laundry are one of the largest sources of microplastics pollution in the ocean.

Wastewater treatment plants can capture up to 95% of incoming microfibres. While this means fewer microfibres going into the ocean, it is much more effective to reduce microfibres before they reach wastewater treatment plants. Research has shown that washing in cold water can reduce the microfibres associated with laundry. With that in mind, Metro Vancouver is launching a new campaign to educate residents about how to reduce microfibre shedding when doing laundry.

In addition to educating residents about how to reduce microfibres shed in laundry, Metro Vancouver is part of research initiatives to better understand the sources and prevalence of microfibres in our wastewater and environment. As the science emerges on how things like microfibers are impacting our aquatic environment, we are supporting research through the Annacis Research Centre where UBC is doing studies on wastewater. We are also learning about options for manufacturers to reduce microfibre shedding and effective policy options that we can promote to higher levels of government.

This report provides information about the development and launch of the microfibres campaign, as identified in the 2021 Liquid Waste Committee Work Plan.

REGIONAL MICROFIBRES REDUCTION CAMPAIGN

Research

Primary market research was conducted in 2020 and 2021 to assess residents' understanding of microfibres and current laundry practices. Research included four qualitative focus groups and three quantitative surveys.

Key findings showed that residents:

- accept that microplastics are unwanted and dangerous for the environment – yet most are unaware of microfibre impacts;
- are influenced by knowing microfibres contaminate human food;
- are interested in reducing microfibres, but don't feel a strong sense of urgency to react;
- are already doing some of the desired behaviours, but for other reasons (e.g. energy savings);
- are open to helping address the issue if asked to do something that fits into their existing routines and habits.

Strategy

The campaign objective is to reduce the number of microfibres released into the wastewater system when textiles are laundered. The audience is Metro Vancouver residents, with a focus on parents with children under 18. Research showed that this group does the most loads of laundry per week and also has a vested interest in taking care of the environment for future generations (i.e. their children).

Research showed that while people were concerned about microfibres, they didn't necessarily feel a sense of urgency around the issue. To increase motivation, the campaign starts with a simple and attainable request — to wash clothes in cold water — and recognizes the impact of this action by thanking residents for incorporating this into their everyday laundry routine. The campaign may build on this to promote additional actions in future years.

Creative Direction

The creative direction is called "The Environment Thanks You". The main idea is to recognize the impact of a small action (switching to cold when doing laundry) and connect it to its larger environmental benefit (fewer microfibres in the ocean). Creative materials feature a series of marine animals thanking people for reducing microfibres by switching to cold.

In focus group testing, respondents had a strong, positive reaction to the campaign creative. The positive tone engaged the audience, motivating them to earn a “thank you.” They accepted the message that clothes should be washed in cold, a call to action that reinforces current behaviours and beliefs, and found the simplicity of the request appealing.

A website (switchtocold.ca) will support the campaign. It will feature the campaign creative and include additional ways to reduce microfibre shedding through laundry practices or clothes purchasing choices.

Media Plan

The media plan includes digital and traditional tactics to reach the main audience (families with children under 18). Tactics include YouTube, Facebook, Instagram, television, digital billboards and Google adwords. Media placement will run from September 13 to October 31, 2021.

Engagement with Members

Prior to launch, campaign details and creative materials were shared with members’ communication staff and the campaign was presented to the REAC Liquid Waste Subcommittee. All materials are available for download on the Metro Vancouver website and members can request custom, co-branded materials. The media buy includes all member jurisdictions, ensuring that the campaign ads appear across the region.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The 2021 microfibre reduction campaign has a budget of \$195,000. These costs are included in the 2021 Liquid Waste Communications Program Budget managed by the External Relations Department.

CONCLUSION

Microfibres from laundry are one of the largest sources of microplastics pollution in the ocean. The microfibre reduction campaign, launching September 13, 2021, asks residents to wash clothes in cold to lower the amount of microfibre produced. Microfibres are a new topic for many residents, most of whom are only aware of microplastics issues. Based on primary research, the campaign focuses on parents with children under 18 because they do the most laundry. The campaign’s simple request to switch to cold fits easily into existing routines and the creative materials thank people for taking this step, both of which received strong support in focus group testing. The campaign website includes additional actions, which may be promoted in future years. Member jurisdictions received campaign details prior to launch and can request custom, co-branded materials.

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To: Liquid Waste Committee

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

Date: July 22, 2021 Meeting Date: September 9, 2021

Subject: **2021 Regional Unflushables Campaign Results**

RECOMMENDATION

That the Liquid Waste Committee receive for information the report dated July 22, 2021, titled “2021 Regional Unflushables Campaign Results.”

EXECUTIVE SUMMARY

The 2021 regional Unflushables campaign took place from April 26 to June 20, 2021. A post-campaign survey showed that the number of residents who report flushing wipes and other campaign items has decreased from 49% (2017) to 37% (2021). De-ragging incidents at pump stations have also decreased from 121 events (2017) to 16 events (projected for 2021). The campaign addresses seven key items that cause ongoing problems for the region’s wastewater system, with an extra focus on wipes and medications. The campaign included social media, television, radio/Spotify, and placements in grocery stores, medical offices, elevators, and hair salons. The campaign delivered 6.4 million impressions on social media, 433 engagements, 732,000 video views and 2,800 clicks for more information, reaching 361,442 residents with campaign messaging. A second two-week digital flight will run in October 2021, and the campaign will run again in 2022 re-using existing creative materials with tweaks as needed.

PURPOSE

To update the Liquid Waste Committee on the 2021 regional Unflushables campaign to reduce the flushing of wipes, medications and other materials.

BACKGROUND

The flushing of wipes, medications and other materials is an ongoing issue for the region’s wastewater system, contributing to clogs, damaged equipment, sewer overflows and impacts on the aquatic environment. Since 2016, Metro Vancouver has conducted regional campaigns to educate the public about what can and cannot be flushed. This messaging has become even more relevant during COVID-19, as many residents have increased their use of wipes and paper towels.

This report provides a summary of the 2021 regional Unflushables campaign results, as identified in the 2021 Liquid Waste Committee Work Plan.

2021 REGIONAL UNFLUSHABLES CAMPAIGN

The 2020 regional Unflushables campaign focused on seven items that should not be flushed: wipes,

paper towels, dental floss, hair, condoms, medications, and tampons and applicators. The main campaign ran from April 26 to June 20; a second, two-week digital flight will run in October 2021.

Campaign Elements and Approach

The campaign continued to use the light-hearted approach and creative materials proven effective in previous years. This year's campaign placed extra emphasis on wipes and medications. The campaign targets adults 25-54, skewing slightly towards women as the main purchasers of many of the products addressed in the campaign. Media placement included YouTube, Facebook, Instagram, TikTok, Snapchat, television, radio/Spotify, Google adwords, and advertising in medical offices, hair salons, grocery stores, and elevators.

Engagement with 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, including the City of Port Coquitlam which used materials in their own campaign. Three cities outside of the region and one building manager within the region also used campaign materials.

Results

Digital Media Performance

Analysis of metrics for the campaign indicate that the digital and social media elements of the campaign generally reached and were relevant to their intended audience. Highlights include:

- digital components delivered 6.4 million impressions, the majority of which came from Facebook, Instagram and YouTube;
- the campaign reached an estimated 361,442 residents via Facebook and Instagram, reaching them repeatedly to build awareness over the length of the campaign;
- social media channels generated 433 engagements (likes, shares, saves, comments);
- video ads received 732,000 views on Facebook, Instagram, YouTube and Snapchat;
- Google Search terms and banners generated 2,800 clicks for more information.

Radio, Television and Out-of-home Placements

Placements were selected to repeatedly expose the audience to campaign messages at relatively low cost (radio/Spotify) and reach target audiences in relevant locations (grocery stores, medical offices). Highlights include:

- an estimated 102,000 people heard the 30-second radio ads, which aired on two radio stations over a three-week period;
- Spotify digital audio ads were served to about 330,000 listeners in the target age group;
- the public service announcement (PSA) video aired 1,457 times;
- electronic advertising in hair salons, elevators, and medical clinics delivered almost 7 million impressions.

Website Traffic

The campaign webpage had over 7,425 page views from April 26 to June 20, with visitors spending over five minutes on the page. The time spent on the page is quite high and indicates that people took the time to read everything on the page. Roughly one-third of people came directly to the website, followed by banner ads (11%) and Snapchat. Snapchat was a new tactic that accounted for 10% of visits to the campaign webpage.

Post-campaign Survey

A post-campaign survey of 1,113 residents was conducted between June 21 and 29. Results showed that:

- most residents surveyed (85%) are aware of how to properly dispose of the wipes and other items targeted by the campaign;
- the number of residents who report sometimes flushing wipes and other campaign items has decreased sharply, dropping from 49% in 2017 to 37% in 2021;
- the proportion of women who say they flush feminine hygiene items has steadily decreased as awareness has increased, dropping from 26% in 2017 to 17% in 2021;
- over a third of respondents (37%) still flush items occasionally, citing convenience as the main reason for flushing; and
- among those who saw the campaign advertising, 31% said they talked about it or its messages with others.

Impacts of Wipes and other Unflushable Items on the Wastewater System

The impacts of wipes and other unflushable items on Metro Vancouver’s wastewater system is tracked through operational work logs of clogs at pump stations that require de-ragging. As fats, oils, and grease can cause wipes and other material to bind together, it can be difficult to measure the direct impacts of unflushable items on the wastewater system.

Records show that 16 to 121 de-ragging events occur each year at Metro Vancouver wastewater pump stations. Data from 2016 onwards shows a decline in the number of events since the launch of the regional Unflushables campaign. There was no evidence of increased events in 2020 or the first six months of 2021 due to increased wipes use during the COVID-19 pandemic. However, the wastewater collection systems within member jurisdictions, acting as the first point of collection, may bear the brunt of impacts within the region.

Table 1. De-ragging events in Metro Vancouver pump stations

Year	Events
2016	53
2017	121
2018	58
2019	34
2020	35
2021	16 (8 events as of June 30, 16 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 a Canadian flushability standard to further prevent improper disposal of unflushable items into wastewater systems.

Plans for 2022

A regional Unflushables campaign is planned for 2022 and will likely continue to place extra focus on wipes and medications. Metro Vancouver will continue to explore opportunities to work with the provincial medications take-back program to promote medications-related messaging. The campaign creative has been in market for five years and some of the longer standing pieces are starting to draw less interest from the target audience. As with this year’s campaign, Metro Vancouver will continue to develop new ways to freshen up the creative for 2022. If COVID-19 restrictions continue to ease, in-person outreach and use of the campaign mascots (Pee and Poo) may once again be an option by summer 2022, which would also provide additional ways to creatively promote the campaign’s message.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The budget for the regional Unflushables campaign is \$140,000. These costs are included in the 2021 liquid waste communications program budget managed by the External Relations department.

CONCLUSION

After five years in market, the campaign has achieved a relatively high awareness of how to properly dispose of wipes and other items. Survey results show that flushing of all campaign items has generally decreased with this increased awareness, with the number of residents who report flushing wipes and other campaign items decreasing from 49% in 2017 to 37% in 2021. De-ragging events at pump stations have also generally declined. Roughly one-third of residents still report occasionally flushing wipes and other items. The campaign will run again in 2022 and will continue to explore new ways to shift these behaviours, including opportunities with the provincial medications take-back program, new creative materials and outreach opportunities (subject to COVID-19 protocols).

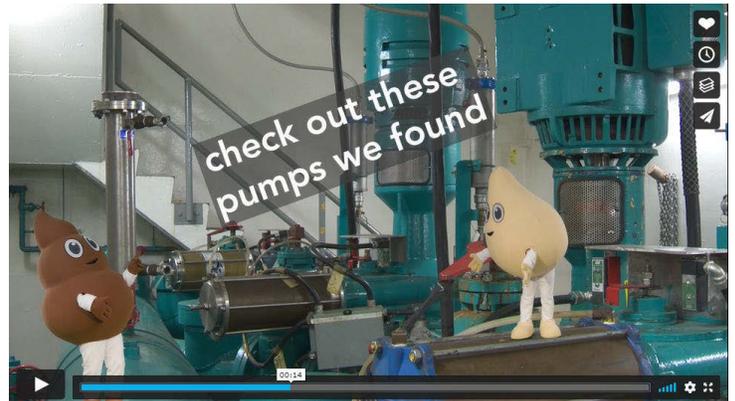
Attachment:

Sample of Campaign Materials

Reference:

[Unflushables campaign website](#)

Sample of Campaign Materials



New campaign videos – Perfect Match, Pee & Poo Visit the Pump Station



Messaging in medical offices and grocery stores



Hair salon placements



Spotify banner ad



Social media post (City of Delta)

To: Liquid Waste Committee

From: Paul Kadota, Acting Director, Policy, Planning and Analysis, Liquid Waste Services

Date: July 19, 2021 Meeting Date: September 9, 2021

Subject: **Continuous Improvement – Innovations Portfolio Management**

RECOMMENDATION

That the Liquid Waste Committee receive for information the report dated July 19, 2021 titled, “Continuous Improvement – Innovations Portfolio Management”.

EXECUTIVE SUMMARY

Some projects funded through the Sustainability Innovation Fund are creating intellectual property assets and have revenue-generating potential. Maximizing value and returns on the utility’s exposure to technological and financial risks have highlighted the need to evolve standard business casing methods to a value-proposition approach with the use of the Business Model Canvas. The Business Model Canvas framework considers a broader suite of business elements to help determine whether a project should: proceed, pivot, or terminate based on new results and other information gained during the research and development journey. The quality of the innovation portfolio is strengthened by the application of the value-proposition approach and successful projects will influence facility planning and process unit designs for more cost-effective service delivery.

PURPOSE

This report is to inform the Liquid Waste Committee of continuous improvements made in the management of innovation initiatives that represent higher risks than routine capital projects.

BACKGROUND

Innovation is a central theme to how Metro Vancouver improves its service delivery to its members and the approach is embedded in its corporate vision statement:

Metro Vancouver embraces collaboration and innovation in providing sustainable regional services that contribute to a livable and resilient region and a healthy natural environment for current and future generations.

Recognizing that improving service delivery often requires taking uncharted paths involving technology development or early adopter risks, the GVS&DD Board created the Liquid Waste Sustainability Innovation Fund (SIF) under Reserve accounts using a portion of the annual GST rebate. The SIF Policy was adopted in June 2014, with further amendments in 2016 to guide the use and management of the Fund. The GVS&DD Board considers SIF project proposals and may approve innovation projects that offer greater potential benefits than the risks taken.

A number of multi-year SIF projects have been individually approved on a case-by-case basis since 2016 and some of the associated research and development efforts are creating intellectual property assets or other revenue-sharing opportunities. This has motivated the evolution of the innovation

management methodology that extends individual project business cases to include a more holistic value-proposition approach to maximize the impact of the liquid waste innovations portfolio.

INNOVATIONS PORTFOLIO MANAGEMENT

Innovations can range from those deemed continuous improvement where the risks and returns are low, to disruptive where the risks and returns are high. In constructing the innovation portfolio, each project must demonstrate a strong value-proposition and should strategically fit into a coordinated balanced portfolio to produce the highest overall return, in line with the desired exposure to risk.

The management of the Liquid Waste Services Innovation portfolio includes a number of elements centered on three main principles:

- 1) Innovation initiatives are utility-driven. This ensures proposed solutions are directly aimed at addressing utility pain-points at source discharges, within the collection and conveyance network, at treatment plants, or the receiving environment.
- 2) The value proposition must benefit Metro Vancouver and its members. Some initiatives may offer extended value as attractive solutions to other customer utilities and jurisdictions.
- 3) The innovation portfolio will be continually shaped by new information. The ideation and innovation process is one of discovery and new information will flow into the value proposition. At select milestones, decisions can be made on projects to: a) stay the course, b) pivot to an alternative path, or c) take the off-ramp to terminate.

Utility-driven solutions naturally align well to address problems identified by the utility. This approach contrasts with solutions developed by academic researchers or start-up companies, without the benefit of utility input. The utility will be in the best position to set expectations for the desired solution, such as its performance, cost, speed of implementation, ease of operations, or other criteria.

Extending beyond standard business cases and triple-bottom line analyses, the value proposition approach works well for initiatives that provide solutions to the utility as well as other customer markets. The development of the solution may have generated intellectual property shared with academic partners and the solution could be attractive to other users, thus has revenue potential. The framework for developing and evolving the value proposition of Liquid Waste SIF projects is provided by the Business Model Canvas.

The Business Model Canvas is an alternative to drafting traditional business plans, providing a more visual framework for nine key business plan elements as shown in Figure 1. The typical use of the Canvas may begin with a mere sketch of the value proposition and all other elements blank. As the ideation stage progresses and the proposition better-defined, additional information on other elements such as customer segments and relations, key partners and activities, as well as costs and revenues can be shaped.

Each time when new information is gained, the value proposition can be assessed and decisions made on the fate of the project. The Business Model Canvas is well-suited for processes involving experimentation, uncertainty of results, discovery and the need to make fairly rapid decisions to stay the course, pivot, or terminate the effort.

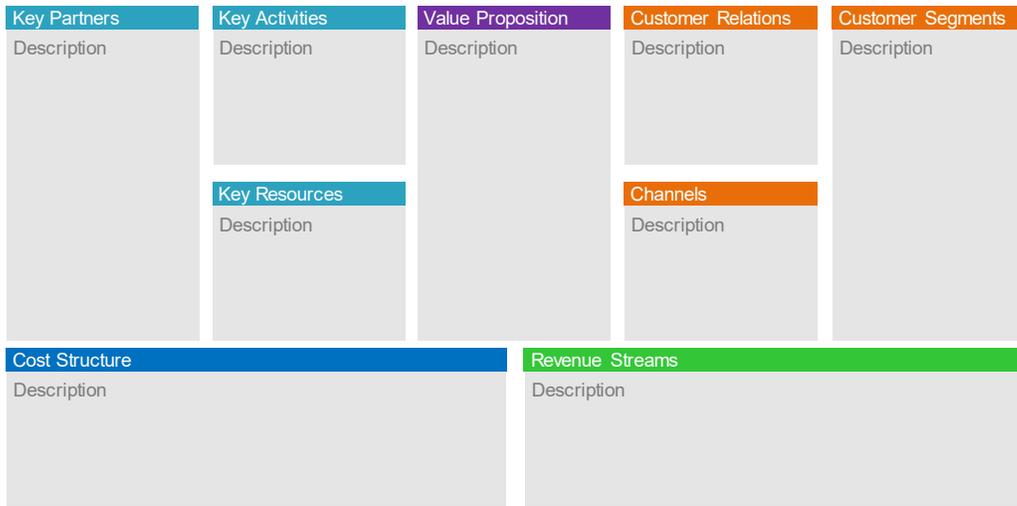


Figure 1: The Business Model Canvas framework.

The application of the Business Model Canvas to all ten Liquid Waste SIF projects resulted in decisions for eight projects to stay the course and for following two projects to be terminated:

- Microwave-enhanced Advanced Oxidation Process Sludge Destruction Pilot
- Capture of wastewater contaminants of concern and beneficial use of residuals.

For additional details, see: “2021 Update on Liquid Waste Sustainability Innovation Fund Project.”

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The termination of two Liquid Waste SIF projects conserves \$565,000 of unspent funding in financial reserves. The application of the value-proposition approach at the start of the ideation stage can help prevent initiating innovation projects that may be favorable technologically, but fails to provide sufficient value back to the utility.

CONCLUSION

Some projects funded by the Sustainability Innovation Fund are generating intellectual property assets or offer revenue-sharing opportunities and have required an evolution of the management methodology to a value-proposition approach. The use of the Business Model Canvas framework and its nine elements help in the consideration of broader business aspects needed to maximize the impact of projects in the innovations portfolio. The Business Model Canvas continually determines the fate of innovation projects and has strengthened the overall quality of the Liquid Waste innovation projects portfolio.

Reference

[2021 Update on Liquid Waste Sustainability Innovation Fund Project](#), dated, May 19, 2021

46689822

Metro Vancouver - Zero Waste Committee - Sept 10th 2021 Executive Summary from Rethink2gether

Why food waste?

- In Canada, **58% of food produced is never eaten**. And avoidable food waste is worth \$49 billion dollars. Every single year! (Second Harvest 2019)
- Food waste has also a huge impact on the environment, representing **8% of total CO2 emissions**. With the wildfires getting more and more intense, it is key to take action.
- In Metro Vancouver, an average restaurant spends **\$51,000** on food that is never eaten. That's 7% of revenues, more than profits! (BC Ministry of Environment and Climate Change 2018). However, most foodservice operators ignore that because they do not measure food waste. And you only manage what you measure.
- The City of Vancouver has committed to become Zero Waste by 2040 and **a leading city in food waste prevention**. Yet food waste data is not made publicly available.

About Rethink2gether



- [Rethink2gether](#) Consulting is a food sustainability consultancy based in Vancouver, BC.
- For hotels and restaurants, we offer food waste consulting expertise, technology, and a certification program called [The PLEDGE on Food Waste](#) to improve financial and sustainability performance. We make it easier by applying technology to the problem and supporting them to make the most of every food purchase. When applied together, after a year, our clients can expect to cut food costs by 3 to 7% and food waste by 20 to 40%. On average, that's a savings of \$15,000 and 12 tonnes of CO2! It's good for the bottom line, and good for the environment!
- We are currently developing [e-learning tools](#) to educate the hospitality industry
- The Co-Founders Laure Dupuy & Ben Liegey are both from France, and have 8+ years of experience consulting across the food supply chain. Ben is also a member of the [Vancouver Food Policy Council](#).

Suggested actions asked to be taken:

- (1) Be aligned with SDG 12.3:** reducing food waste by 50% (not only diverting food waste to landfill, but reducing food waste generated)
- (2) Report publicly food waste data every year**, including both commercial and residential food waste generated within Metro Vancouver (as suggested in a Food Waste Motion passed by the Vancouver Food Policy Council in Oct 2020)
- (3) Consider The PLEDGE on Food Waste certification program** as an additional way to becoming a leader in food waste prevention. Other areas like Singapore and [Mauritius](#) are leading the way.

To: Zero Waste Committee

From: Brandon Ho, Senior Project Engineer, Solid Waste Services

Date: September 2, 2021 Meeting Date: September 10, 2021

Subject: **2020 Disposal Ban Program Update**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated September 2, 2021, titled "2020 Disposal Ban Program Update".

EXECUTIVE SUMMARY

Garbage loads received at regional solid waste facilities are visually inspected for banned materials, and surcharges are applied if banned materials are present. Metro Vancouver's solid waste facilities received 782,000 loads of garbage in 2020 up 7% from 2019. This increase is associated with an increase in small loads likely resulting from pandemic related impacts. 221,875 garbage loads were inspected (28% of total loads): 27,040 were found to contain banned materials and 6,642 surcharge notices were issued, representing a surcharge rate of 3%. Electronic waste, corrugated cardboard and oversized objects were the top three banned materials identified. The pandemic may have contributed to more electronics in the waste stream due to temporary disruptions in the electronics collection network. Surcharges on mattresses and gypsum decreased in 2020. Total surcharge revenues were \$724,729 and total program expenditures were \$721,902. A temporary disposal ban waiver has been put in place for waxed cardboard as a result of reduced options for recycling waxed cardboard.

PURPOSE

The purpose of this report is to update the Zero Waste Committee on the 2020 results of the Metro Vancouver disposal ban program.

BACKGROUND

Disposal ban program results are reported annually as outlined in the Zero Waste Committee work plan. The program helps keep readily recyclable materials and materials that pose operational risks and other hazards out of the waste stream.

2020 DISPOSAL BAN PROGRAM RESULTS

The *Greater Vancouver Sewerage and Drainage District Tipping Fee and Solid Waste Disposal Regulation Bylaw No. 306, 2017*, as amended (Tipping Fee Bylaw) specifies a list of over 40 banned materials restricted from disposal (Attachment 1). Loads received at regional solid waste facilities are visually inspected for banned materials, and surcharges are applied if banned materials are present in quantities exceeding the thresholds defined in the Tipping Fee Bylaw. Metro Vancouver reports annually on program results including inspection and surcharge rates, and surcharges by material and customer type.

Disposal Ban Program Results

Metro Vancouver implemented a new paperless disposal ban inspection and surcharge program (eSurcharge) in July 2019. In 2020, all inspectors used mobile tablets with integrated cameras to record inspections. Loads are inspected and recorded as containing no banned materials, containing banned materials but reloaded onto their vehicles, or with banned materials and surcharged. Account customers receive surcharge notices and photos by email as soon as the surcharge is issued.

In 2020, the number of garbage loads received at regional solid waste facilities was 7% higher than in 2019 because of an increased number of small loads. Other communities also experienced increases in small loads in 2020, likely a result of the pandemic. Inspectors identified more loads containing banned materials in 2020 than in 2019. Table 1 provides a multi-year comparison of disposal ban program results. The inspection rate has been consistent over the last three years with an increased number of loads containing banned materials resulting in an increased number of surcharges. In 2020, 221,875 garbage loads were inspected (28% inspection rate), and 27,040 (or approximately 12%) of inspected loads contained banned materials. Inspectors were able to work with customers to prevent 20,398 loads containing banned materials from being disposed as garbage, instead inspectors provided alternative recycling options.

Table 1: Inspection Statistics for Regional Solid Waste Facilities

Year	Garbage Loads	Loads Inspected	Inspection Rate	Re-Loads	Surcharge Notices	Surcharge Rate
2018	741,600	188,135	25%	13,153	3,554	1.9%
2019	729,479	202,521	28%	16,578	4,294	2.1%
2020	782,333	221,875	28%	20,398	6,642	3.0%

Results by Material Type

Table 2 summarizes the distribution of surcharged loads by banned material type. The largest category was electronic waste (including vacuums, kitchen appliances, home entertainment systems, computers, and other household electronic items), representing 35% of surcharged loads, up from 30% in 2019. Corrugated cardboard accounted for 20% of the surcharge notices in 2020, down from 24% in 2019. Large objects accounted for 10% of the surcharge notices in 2020, up from 5% in 2019. The majority of these large objects were identified at the Waste-to-Energy Facility where the length of an object is limited to one metre due to operational impacts.

Increased electronic surcharges may be the result of more electronic devices in the waste stream in 2020. Extended producer responsibility programs for electronic and electrical devices, generated lower collection amounts in 2020 for several programs. Extended producer responsibility programs experienced short-term depot closures as well as disruptions to return-to-retail initiatives due to COVID-19 restrictions. Further, consumers may have chosen not to utilize the existing collection network due to personal health reasons. Metro Vancouver staff will continue to engage with these programs to ensure electronic and electrical devices are diverted and returned to the programs for end-of-life management. Metro Vancouver also ran a targeted digital promotion to educate residents on the importance of electronics (e-waste) and battery recycling in fall of 2020 (coinciding with National Waste Reduction Week in October). Digital channels included, Facebook, Instagram, and

YouTube and all messaging directed residents to www.MVRecycles.org to find locations to drop off e-waste and used batteries for recycling.

The proportion of loads surcharged for mattresses and gypsum decreased in 2020 compared to 2019 and 2018. Residential used gypsum disposal program that has been available at all Metro Vancouver solid waste facilities since the fall of 2018. Other banned materials listed in Table 2 remained stable and each accounted for 5% or less of total surcharge notices.

In 2020, there were 198 surcharges issued for waxed cardboard. Metro Vancouver has reviewed the availability of recycling alternatives for waxed cardboard and has temporarily relaxed the disposal ban on waxed cardboard from August 3, 2021 to January 3, 2022 due to limited options for recycling. A similar review in June 2020 identified more options for waxed cardboard recycling.

Table 2: Summary of Materials Contained in Surcharged Loads at Regional Solid Waste Facilities

Material	2018	2019	2020
Electronic Waste	25%	30%	35%
Cardboard	19%	24%	20%
Large Objects	4%	5%	10%
Mattresses	16%	14%	9%
Other Banned Materials	4%	6%	5%
Food Waste	2%	4%	4%
Paint (Includes empty containers)	3%	3%	4%
Gypsum	10%	4%	3%
Tires	5%	3%	3%
Clean Wood	6%	2%	3%
Expanded Polystyrene Packaging	1%	1%	2%
Green Waste	2%	1%	< 1%
Oil (Includes containers and filters)	1%	1%	< 1%
Recyclable Containers	1%	1%	< 0.5%
Recyclable Paper	1%	1%	< 0.5%

Surcharges by Customer Type

Table 3 summarizes the number of inspections and surcharge notices by customer type in 2020. The surcharge rate for commercial loads was higher than other customer types, due to the volumes, types of materials and how they are collected. Residential cash non-account customers arriving in small vehicles normally unload materials manually and are able to separate and recycle banned materials more easily, while banned items in commercial loads cannot typically be reloaded into garbage trucks for safety and operational reasons.

Table 3: Summary of Surcharges by Customer Type for 2020

Customer Type	Inspections	Surcharge Notices	Surcharge Rate
Commercial	53,413	5,601	10%
Municipal	9,188	504	5.5%
Non-account	159,274	537	0.3%
Totals	221,875	6,642	3.0%

Dispute Resolution

Customers may dispute a surcharge within 30 days of it being issued by completing a dispute form. Metro Vancouver received 26 surcharge disputes in 2020 related to clean wood, corrugated cardboard, electronics, expanded polystyrene, food waste, large objects, mattresses, and recyclable paper. Ten surcharge notices were rescinded as summarized in Table 4.

Table 4: Surcharge Dispute Summary

Year	Surcharge Disputes Received	Surcharge Notices Rescinded
2018	17	9
2019	17	11
2020	26	10

Hauler Surcharge Information

The surcharge amount for each hauler with total surcharges exceeding \$1,000 is shown in Attachment 2 (Metro Vancouver facilities only). The hauler surcharge rate is the number of surcharge notices divided by the estimated number of inspections for each hauler.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

In 2020, surcharge revenues were \$742,729 with \$726,093 from Metro Vancouver solid waste facilities and \$16,636 from City of Vancouver solid waste facilities as shown in Attachment 3. Total program expenditures for regional facilities in 2020 were \$721,902.

CONCLUSION

The disposal ban program helps keep readily recyclable materials and materials that pose operational risks and other hazards out of the waste stream. In 2020, 221,875 loads were inspected, 27,040 loads were found to contain banned materials and 6,642 surcharge notices were issued. The disposal ban program remains an effective tool to encourage waste reduction and diversion.

Attachments

1. 2020 Banned Materials
2. 2020 Solid Waste Surcharge Information at Metro Vancouver Facilities
3. 2020 Solid Waste Surcharge Summary

2020 Banned Materials

Banned Hazardous and Operational Materials (\$65 surcharge on any single item plus the costs of remediation and clean-up)	
• Agricultural Waste	• Hazardous Waste
• Automobile Parts	• Inert Fill Materials
• Barrels or Drums (205 L or greater)	• Liquids or Sludge
• Creosote Treated Wood	• Mattresses
• Dead Animals	• Oversize Objects
• Dusty or Odourous	• Personal Hygiene Products over 10% of the load
• Excrement	• Propane Tanks
• Flammable Materials	• Toxic Plants
• Gypsum	• Wire, Hosing, Rope or Cable longer than 1 m

Banned Recyclable Materials (50% surcharge on Items above the threshold)
5% threshold on any combination of the following: <ul style="list-style-type: none"> • Beverage containers • Other recyclable plastic, glass, metal, and composite material containers • Corrugated cardboard • Recyclable paper • Green waste • Clean Wood
25% threshold on food waste

Banned Recyclable Materials (100% surcharge on Items above the threshold)
20% threshold on expanded polystyrene packaging

Banned Product Stewardship Materials (\$65 surcharge on any single item)	
• Antifreeze and Containers	• Paint and Paint Containers
• Electronics and Electrical Products	• Pesticides
• Gasoline	• Pharmaceutical Products and Medications
• Lead-Acid Batteries	• Solvents and Flammable Liquids
• Lubricating Oil and Containers	• Tires
• Oil, Oil Filters, Oil Containers	

2020 Solid Waste Surcharge Information Metro Vancouver Facilities		
Hauler (MV Facilities)	Surcharge Amount*	Hauler Surcharge Rate**
Bullseye Environmental Inc.	\$ 1,266	16%
Canada Minibins Ltd.	\$ 7,301	9%
Cascades Recovery	\$ 7,054	13%
City of Burnaby	\$ 33,869	18%
City of Coquitlam	\$ 4,026	11%
City of New Westminster	\$ 1,915	8%
City of Port Coquitlam	\$ 3,265	16%
City of Surrey	\$ 10,268	7%
District of North Vancouver	\$ 5,855	8%
Fraser Health Authority	\$ 1,009	2%
GFL Environmental	\$ 146,144	13%
Halton Recycling Ltd.	\$ 10,735	11%
Mack Kirk Roofing & Sheet Metal Ltd.	\$ 1,382	9%
Maple Leaf Disposal Ltd.	\$ 13,454	10%
Metro Disposal	\$ 3,285	4%
Mini-Load Disposal	\$ 1,108	4%
North Star Waste Management	\$ 2,218	51%
NSD Disposal Ltd.	\$ 6,531	11%
Providence Health Care	\$ 3,604	9%
Revolution Resource Recovery Inc.	\$ 65,632	15%
RJ Disposal Ltd.	\$ 2,535	8%
SF Disposal Queen	\$ 5,558	21%
Super Save Disposal Inc.	\$ 94,890	16%
Total Site Services	\$ 1,662	38%
Urban Impact Recycling Ltd.	\$ 19,823	6%
Vancouver Coastal Health	\$ 2,644	5%
Waste Connections of Canada	\$ 71,980	16%
Waste Control Services Inc.	\$ 27,391	9%
Waste Management of Canada Corporation	\$ 124,201	19%
Wescan Disposal	\$ 2,741	8%
Yellow Fence Rentals Inc.	\$ 1,863	31%

* Does not include haulers with surcharge amounts less than \$1,000.

** Hauler surcharge rate is equal to the number of surcharges divided by the estimated number of inspections for each hauler. The estimated inspection rate is assumed to be equal to the overall inspection rate for that category of customer.

ATTACHMENT 3

2020 Solid Waste Surcharge Summary	Surcharge Amount
Metro Vancouver Facilities (\$ 726,093)	
- Commercial	\$ 633,298
- Municipal	\$ 62,087
- Cash Customers	\$ 30,708
City of Vancouver Facilities	\$ 16,636
Total	\$ 742,729

To: Zero Waste Committee

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

Date: September 2, 2021 Meeting Date: September 10, 2021

Subject: **Waste-to-Energy Facility Environmental Monitoring and Reporting 2020 Update**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated September 2, 2021, titled “Waste-to-Energy Facility Environmental Monitoring and Reporting 2020 Update”.

EXECUTIVE SUMMARY

The Metro Vancouver Waste-to-Energy Facility operates well within environmental standards. All air emission related parameters monitored during 2020 were in compliance with the Waste-to-Energy Facility Operational Certificate. Metal emissions are less than 5% of regulatory limits. Dioxins/furans and trace organics are less than 2% of regulatory limits, with the exception of chlorobenzenes being less than 25% of the regulatory limit. Nitrogen oxides and fine particulate Waste-to-Energy emissions represent 0.4% and 0.002% of regional airshed totals. The Waste-to-Energy Facility accounts for less than 1% of regional greenhouse gas emissions.

On December 3, 2020, the 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. Metro Vancouver installed a new air quality monitoring station immediately adjacent to the Waste-to-Energy Facility and added air quality monitoring equipment to an existing monitoring station near the Waste-to-Energy Facility. Data collected to date shows ambient concentrations of hydrogen chloride and sulphur dioxide are less than 5% of ambient air quality standards, and well below modelling projections.

PURPOSE

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

BACKGROUND

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

This report provides updates on the facility’s 2020 environmental performance and the implementation of the Waste-to-Energy Facility Operational Certificate requirements. The report is identified in the Zero Waste Committee annual work plan and as such is being brought forward at this time.

ENVIRONMENTAL MONITORING AND REPORTING UPDATE

Since the Waste-to-Energy Facility opened in 1988, Metro Vancouver has striven to continually reduce emissions through assessment, operational and plant infrastructure improvements and environmental controls. All air emission related parameters monitored during 2020 were in compliance with the requirements of Operational Certificate 107051. A summary of historic annual emission performance, including 2020 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, the City of Burnaby and the Fraser Health Authority, and are posted publicly on the Metro Vancouver website;
- Manual stack testing is conducted by an independent stack testing company four times a year for particulate matter, trace metals, and hydrogen fluoride. Results are provided to the BC Ministry of Environment and Climate Change Strategy, City of Burnaby, 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 2020 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. Procurement is underway for the beneficial use of bottom ash.

Operational Certificate Implementation

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 air quality monitoring station at Burnaby South 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 initiated procurement for 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 shows ambient air concentrations of hydrogen chloride and sulphur dioxide are less than 5% of ambient air quality objectives, and well below modelling results. Nitrogen oxide levels are within ambient air quality objectives and lower than 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.

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. 2020 greenhouse gas emissions were verified by PwC Canada, and reported to the provincial and federal governments, at a total of 295,275 tonnes carbon dioxide equivalents, an increase of approximately 8% compared to 2019. 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. Of these emissions, 47% are anthropogenic and 53% are biogenic. Over the past three years, the anthropogenic portion of greenhouse gas emissions has ranged from 40% to 47%. 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, fly ash and bottom ash, for the preceding calendar year to the National Pollutant Release Inventory. Table 1 summarizes the information which has been reported to the National Pollutant Release Inventory.

Table 1: 2020 National Pollutant Release Inventory Substance Reporting Summary

Substance	Reported Quantity (tonnes)	
	Stack Emissions	Ash Disposal
Nitrogen Oxides	221.4	N/A
Carbon Monoxide	53.9	N/A
Sulphur Dioxide	111.2	N/A
Hydrogen Chloride/Hydrochloric Acid	93.0	N/A
Aluminum (dust)	0.009	N/A
Arsenic	0.00071	1.70
Cadmium	0.00017	1.58
Cobalt	0.00017	1.40
Copper	0.00041	101.7
Lead	0.00112	25.9
Manganese	0.00083	28.5
Mercury	0.0019	0.056
Phosphorus	0.0021	518.6
Zinc	0.0042	240.9
Particulate Matter ≤ 10µm	0.79	N/A
Particulate Matter ≤ 2.5µm	0.63	N/A
Dioxins and Furans	N/A	N/A
Hexachlorobenzene	N/A	N/A

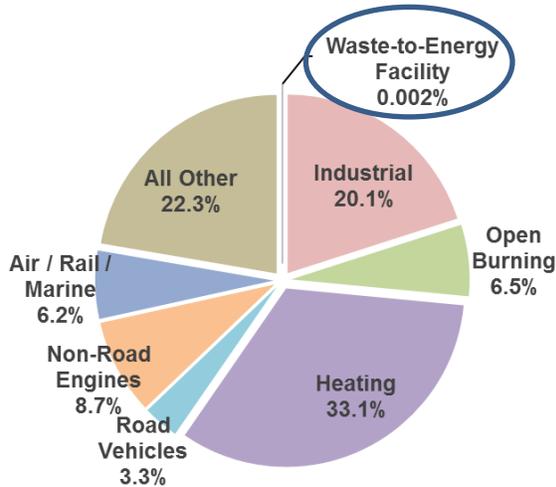
- Notes: - All other substances are below the National Pollutant Release Inventory level of quantification and are not required to be reported.
- 'N/A' indicates value is either below the level of quantification, below the detection limit, or the substance is not found in ash.
 - Ash tonnages reported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

Waste-to-Energy Facility in a Regional Context

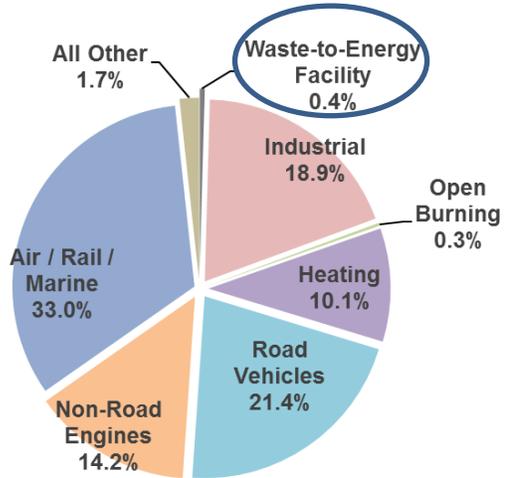
Figure 1 compares Waste-to-Energy Facility emissions to total emissions from all regional sources for two key air contaminants in the Lower Fraser Valley – fine particulate matter and nitrogen oxides (a key smog forming pollutant). In 2020, the Waste-to-Energy Facility accounted for 0.002% of regional fine particulate matter emissions and 0.4% of regional nitrogen oxide emissions. The Nitrogen Oxide Reduction Project, completed in October 2014, reduced nitrogen oxide emissions from 0.9% of the regional total in 2013 to 0.4% in 2020.

Figure 1: Regional Emissions Distribution (2020) – Fine Particulate Matter and Nitrogen Oxides

2020 Lower Fraser Valley Fine Particulate Matter Emission Sources



2020 Lower Fraser Valley Nitrogen Oxide Emission Sources



ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

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

CONCLUSION

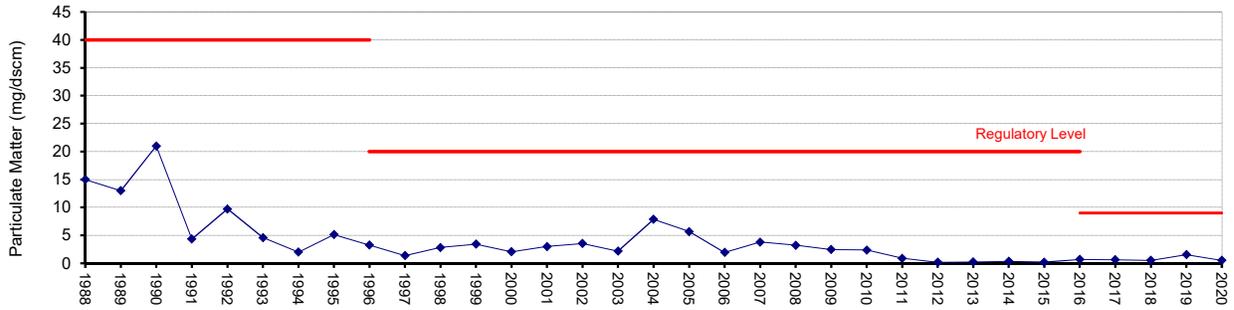
The Waste-to-Energy Facility operates well within environmental standards and regulatory limits. A range of projects that continuously improve the facility’s environmental performance have been completed or are underway. All air emission related parameters monitored during 2020 were in compliance with Operational Certificate 107051. Continuous emissions monitoring data and all compliance reports are available on the Metro Vancouver website.

Attachments (Orbit #46499548)

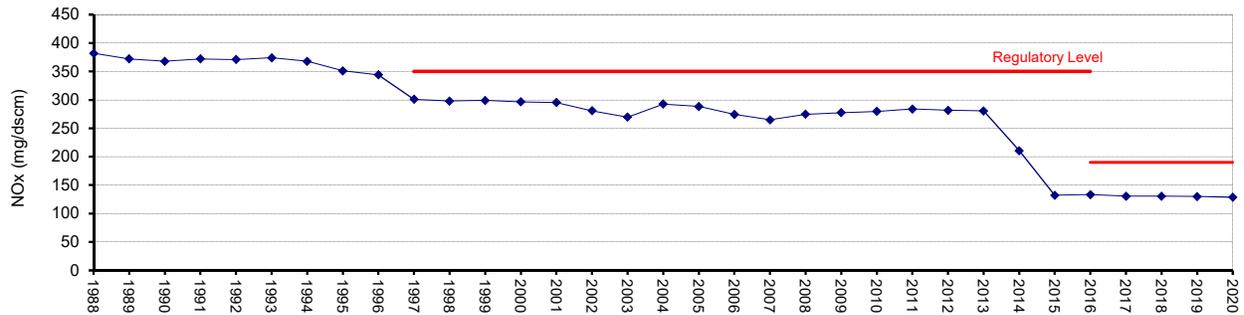
1. Metro Vancouver Waste-to-Energy Facility Summary of Air Emissions 1988-2020
2. Ambient Air Quality Report for Metro Vancouver Waste-to-Energy Facility– July 2021

Metro Vancouver Waste-To-Energy Facility Summary of Air Emissions 1988 - 2020

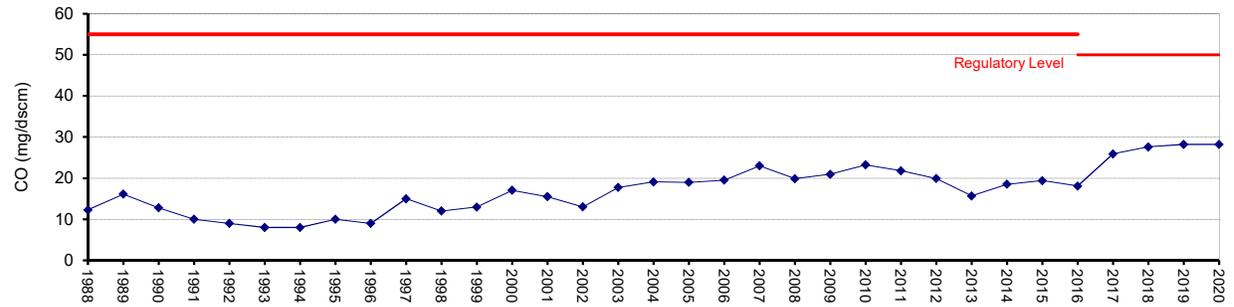
Particulate Matter



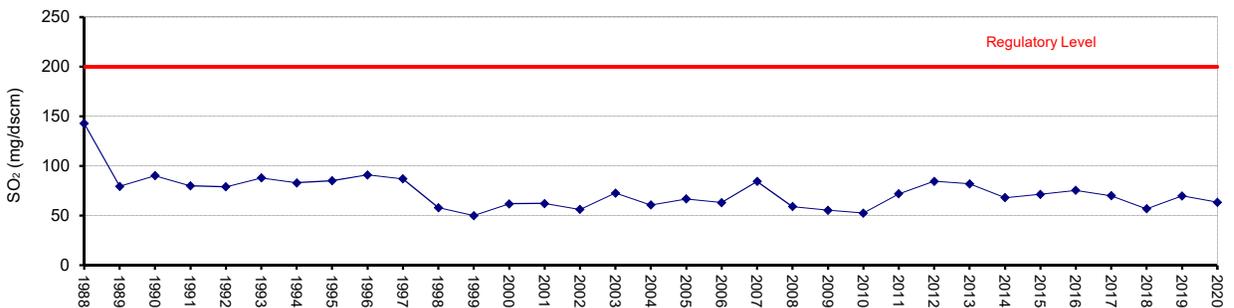
Nitrogen Oxides



Carbon Monoxide

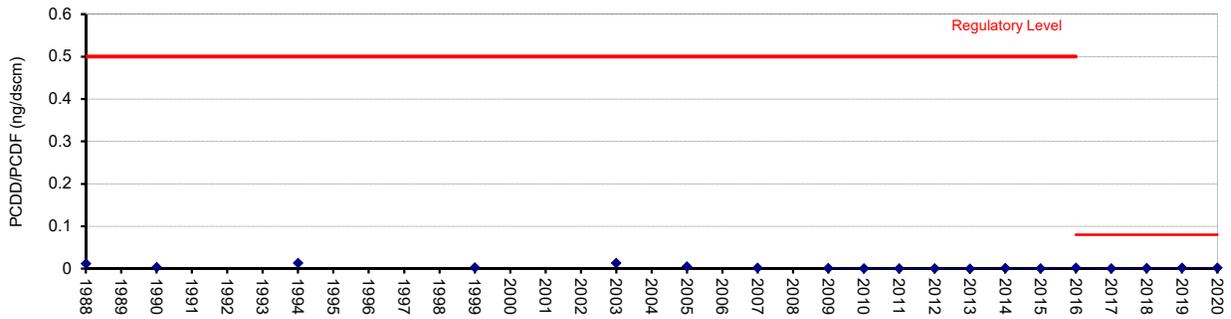


Sulfur Dioxide

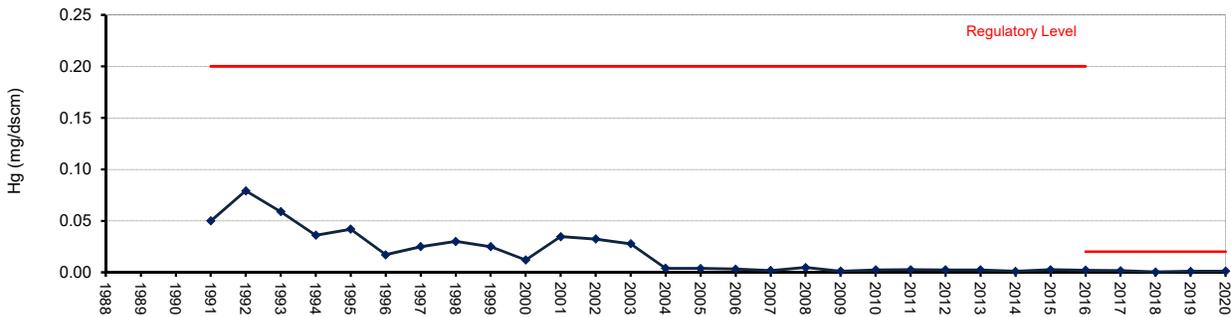


Metro Vancouver Waste-To-Energy Facility Summary of Air Emissions 1988 - 2020

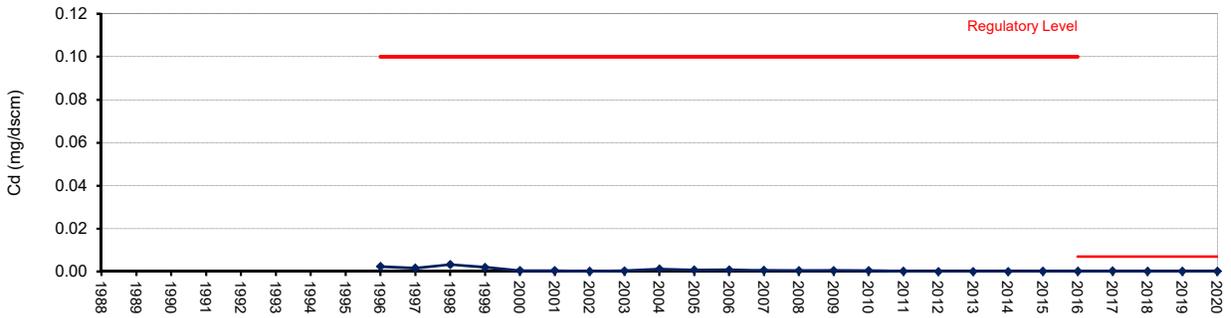
Dioxins/Furans



Mercury



Cadmium



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

Monthly Summary Report - July 2021

Prepared August 26, 2021

Metro Vancouver operates a network of ambient air quality monitoring stations in Metro Vancouver and the Fraser Valley. Two of these monitoring stations, Burnaby South (T018) and WTEF (S150) are located near to Metro Vancouver's Waste-to-Energy Facility.

Data in this summary report is considered preliminary. While some preliminary quality assurance and quality control has been applied to the data, it is subject to change, without notice pending the completion of additional quality assurance, quality control and verification procedures by Metro Vancouver at a future time.

Data in this report are compared to ambient air quality objectives. More information on ambient air quality objectives can be found at: <http://www.metrovancouver.org/services/air-quality/about/air-quality-monitoring/ambient-air-quality-objectives/>

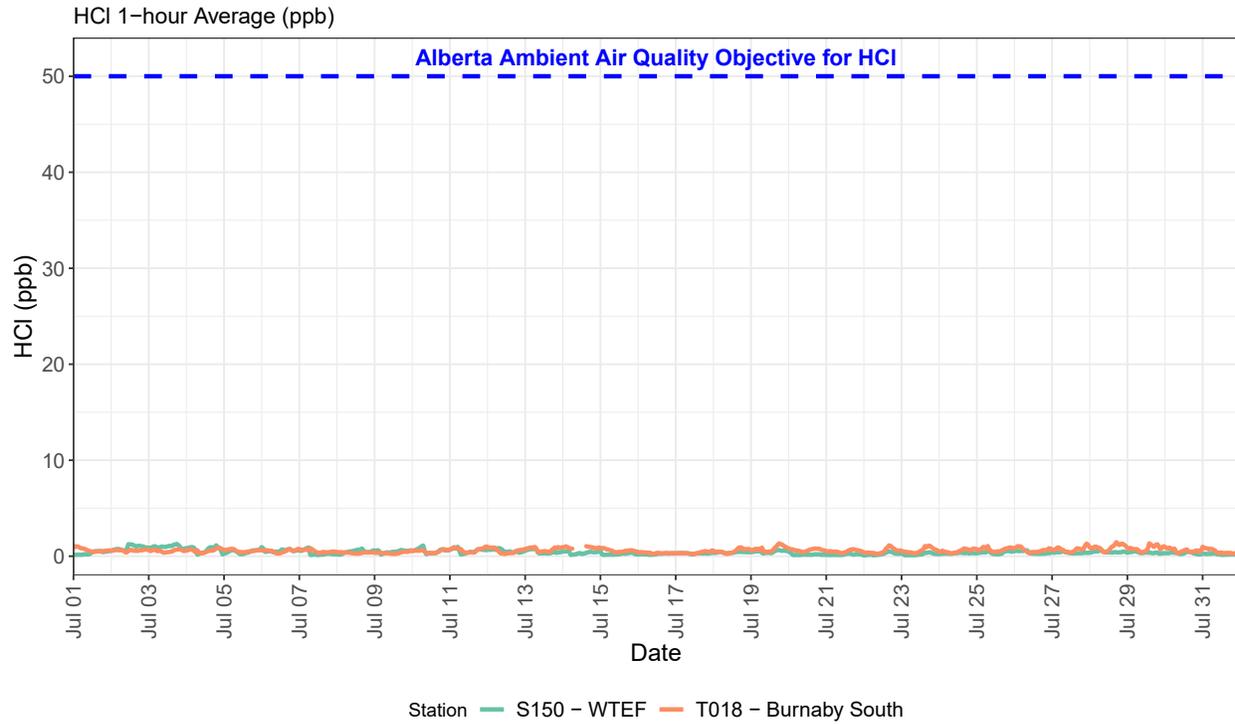
For additional information please see:

Current Air Quality (<http://airmap.ca>)

Air Quality Monitoring (<http://www.metrovancouver.org/services/air-quality/about/air-quality-monitoring>)

HCl (hydrogen chloride) Monthly Summary - WTEF and Burnaby South

Metro Vancouver does not have an ambient air quality objective for hydrogen chloride (HCl). The Province of Alberta has a 1-hour objective for HCl of 50 ppb.

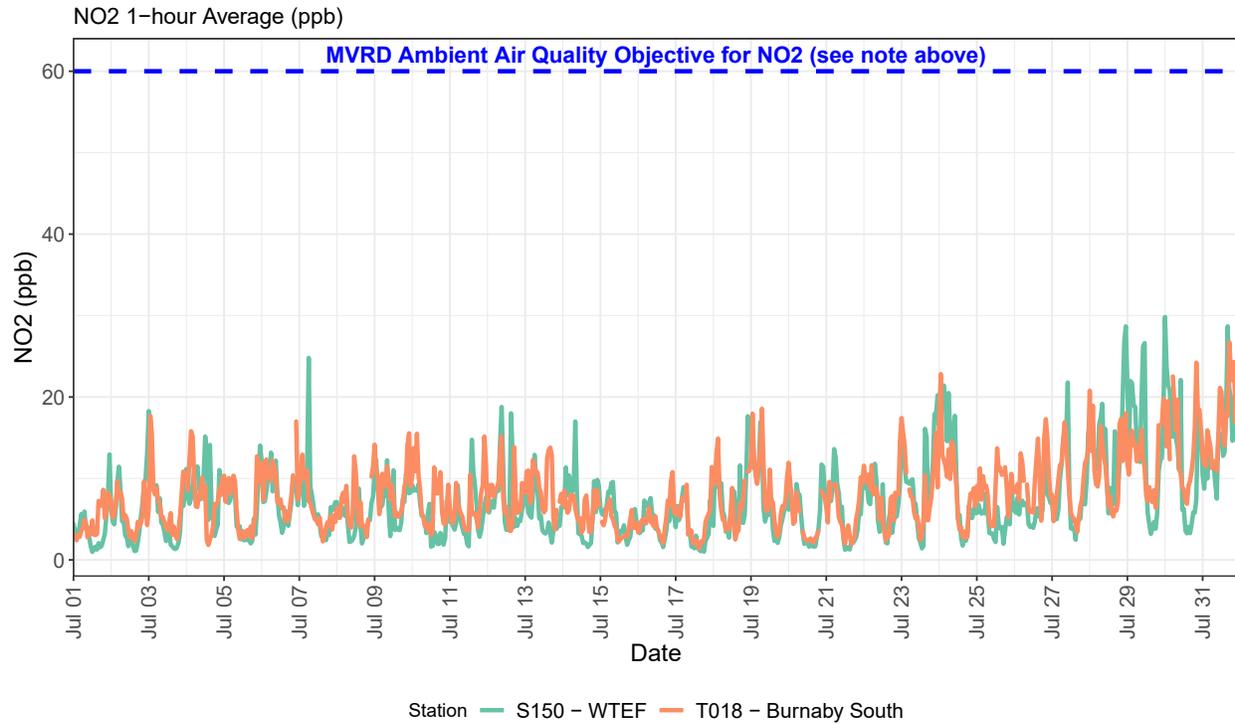


PRELIMINARY DATA

Date	Daily Average HCl Concentratio (ppb)		Daily 1-hour Maximum HCl Concentratio (ppb)	
	S150 - WTEF	T018 - Burnaby South	S150 - WTEF	T018 - Burnaby South
2021-07-01	0.3	0.7	0.6	1.1
2021-07-02	0.9	0.6	1.3	0.7
2021-07-03	1.0	0.6	1.3	0.8
2021-07-04	0.7	0.6	1.1	0.9
2021-07-05	0.5	0.6	0.8	0.8
2021-07-06	0.6	0.5	0.9	0.8
2021-07-07	0.3	0.5	0.9	0.8
2021-07-08	0.5	0.4	0.8	0.4
2021-07-09	0.5	0.4	0.7	0.6
2021-07-10	0.6	0.5	1.1	0.7
2021-07-11	0.6	0.7	1.0	1.0
2021-07-12	0.6	0.6	0.8	1.0
2021-07-13	0.5	0.7	0.9	1.0
2021-07-14	0.4	0.9	0.5	1.0
2021-07-15	0.2	0.6	0.6	0.9
2021-07-16	0.2	0.3	0.3	0.4
2021-07-17	0.3	0.4	0.4	0.6
2021-07-18	0.4	0.6	0.5	0.9
2021-07-19	0.5	0.8	0.7	1.3
2021-07-20	0.2	0.6	0.5	0.8
2021-07-21	0.2	0.5	0.3	0.7
2021-07-22	0.2	0.5	0.5	1.1
2021-07-23	0.2	0.6	0.4	1.1
2021-07-24	0.3	0.5	0.4	0.8
2021-07-25	0.4	0.7	0.5	1.1
2021-07-26	0.4	0.6	0.6	1.0
2021-07-27	0.4	0.7	0.5	1.3
2021-07-28	0.5	0.9	0.7	1.5
2021-07-29	0.4	0.8	0.5	1.3
2021-07-30	0.3	0.6	0.5	1.0
2021-07-31	0.2	0.5	0.3	1.0

NO2 (nitrogen dioxide) Monthly Summary - WTEF and Burnaby South

Metro Vancouver's ambient air quality objective for 1-hour NO2 is based on the analysis of three consecutive years of data, the annual 98th percentile of the daily maximum 1-hour concentration is averaged over three consecutive years. The dashed blue line in the figure below shows the numerical value of Metro Vancouver's 1-hour NO2 ambient air quality objective (60 ppb). If the preliminary NO2 data shown in this report has a concentration above the numerical value, it does not necessarily indicate an exceedance of the Metro Vancouver objective. Achievement of the objective is determined at the end of each calendar year.

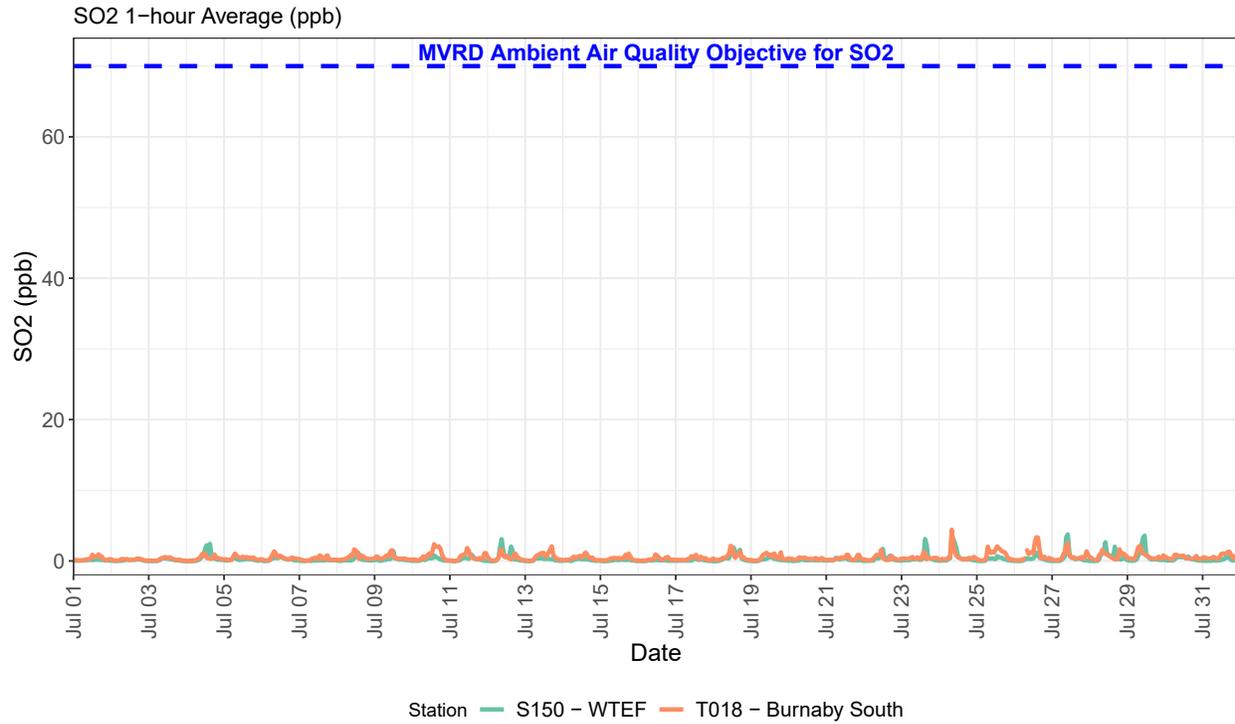


PRELIMINARY DATA

Date	Daily Average NO2 Concentration (ppb)		Daily 1-hour Maximum NO2 Concentration (ppb)	
	S150 - WTEF	T018 - Burnaby South	S150 - WTEF	T018 - Burnaby South
2021-07-01	3.7	4.6	13.0	8.6
2021-07-02	5.4	5.5	13.2	9.7
2021-07-03	5.6	6.8	18.3	17.7
2021-07-04	8.8	7.9	15.2	15.8
2021-07-05	5.7	6.5	14.0	12.7
2021-07-06	7.9	8.9	13.2	17.0
2021-07-07	7.0	6.2	24.8	12.9
2021-07-08	5.0	6.6	8.8	12.7
2021-07-09	7.4	9.0	12.3	15.6
2021-07-10	5.0	7.6	9.3	15.5
2021-07-11	5.6	6.6	14.8	15.2
2021-07-12	7.8	7.9	18.8	15.2
2021-07-13	5.6	9.0	12.9	13.8
2021-07-14	6.5	6.2	17.0	8.6
2021-07-15	5.2	4.3	9.6	7.4
2021-07-16	4.8	5.0	8.3	10.8
2021-07-17	4.0	4.8	8.9	11.4
2021-07-18	7.5	7.1	17.6	14.9
2021-07-19	7.7	8.8	16.9	18.6
2021-07-20	5.3	5.1	11.7	11.9
2021-07-21	5.6	5.6	13.6	10.1
2021-07-22	6.6	7.6	11.8	14.6
2021-07-23	10.0	8.5	20.2	17.4
2021-07-24	10.8	9.2	21.4	22.8
2021-07-25	5.0	8.5	8.9	13.7
2021-07-26	6.7	9.9	13.5	17.3
2021-07-27	8.5	9.0	21.8	16.9
2021-07-28	14.0	11.8	28.7	20.8
2021-07-29	13.5	11.9	26.6	19.8
2021-07-30	12.9	14.4	29.8	24.2
2021-07-31	14.2	16.8	28.7	26.7

SO2 (sulphur dioxide) Monthly Summary - WTEF and Burnaby South

Metro Vancouver's ambient air quality objective for 1-hour SO2 is a never to exceed objective. The dashed blue line in the figure below shows the numerical value of the SO2 objective, 70 ppb.



PRELIMINARY DATA

Date	Daily Average SO2 Concentration (ppb)		Daily 1-hour Maximum SO2 Concentration (ppb)	
	S150 - WTEF	T018 - Burnaby South	S150 - WTEF	T018 - Burnaby South
2021-07-01	0.1	0.3	0.2	0.9
2021-07-02	0.1	0.2	0.2	0.3
2021-07-03	0.1	0.2	0.5	0.5
2021-07-04	0.5	0.4	2.4	1.1
2021-07-05	0.2	0.4	0.5	1.0
2021-07-06	0.2	0.4	0.6	1.4
2021-07-07	0.1	0.3	0.2	0.8
2021-07-08	0.2	0.5	1.3	1.6
2021-07-09	0.2	0.5	1.4	1.5
2021-07-10	0.2	0.8	0.8	2.4
2021-07-11	0.2	0.5	0.9	1.8
2021-07-12	0.6	0.5	3.1	1.6
2021-07-13	0.2	0.6	0.5	2.1
2021-07-14	0.1	0.4	0.3	1.1
2021-07-15	0.1	0.3	0.2	1.0
2021-07-16	0.1	0.3	0.1	0.9
2021-07-17	0.1	0.3	0.3	0.9
2021-07-18	0.5	0.6	1.9	2.1
2021-07-19	0.2	0.5	0.6	1.2
2021-07-20	0.1	0.3	0.4	0.5
2021-07-21	0.2	0.4	0.4	0.9
2021-07-22	0.3	0.4	1.7	1.6
2021-07-23	0.4	0.4	3.1	1.2
2021-07-24	0.6	0.7	3.5	4.4
2021-07-25	0.2	0.9	0.7	2.1
2021-07-26	0.3	0.9	1.2	3.4
2021-07-27	0.5	0.6	3.8	2.5
2021-07-28	0.6	0.7	2.6	1.7
2021-07-29	0.6	0.7	3.6	2.1
2021-07-30	0.3	0.5	0.6	0.9
2021-07-31	0.2	0.6	1.3	1.3

To: Zero Waste Committee

From: Adriana Velázquez, Project Engineer, Solid Waste Services

Date: September 2, 2021 Meeting Date: September 10, 2021

Subject: **Illegal Dumping in Metro Vancouver**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated September 2, 2021, titled “Illegal Dumping in Metro Vancouver”.

EXECUTIVE SUMMARY

In 2020, member jurisdictions reported 47,000 illegal dumping incidents, including 720 incidents of abandoned gypsum. Municipalities spent \$3.6 million on the removal and disposal of abandoned items. In addition, municipalities spent \$2.5 million on large item pick-up programs. COVID-19 restrictions coincided with a temporary decrease in illegal dumping incidents in spring 2020, followed by increases in subsequent months. Overall costs of illegal dumping have increased across the region by on average 4.7% per year over the last three years. Some of the increases in the total number of illegal dumping incidents may be a result of improved reporting practices, rather than a true increase in illegal dumping activity. Illegal dumping of gypsum materials continues to be a challenging and costly issue for municipalities. Receipt of residential gypsum at all Metro Vancouver recycling and waste centres as of the fall of 2018 appears to have provided some benefit with respect to reducing illegal dumping of gypsum materials.

Metro Vancouver and member jurisdictions continue to advance a number of initiatives including education, enforcement and enhanced data management to help reduce illegal dumping. Enhanced extended producer responsibility programs for items such as mattresses would help reduce illegal dumping by reducing costs to residents to manage those materials.

PURPOSE

The purpose of this report is to update the Zero Waste Committee on regional illegal dumping trends and related municipal programs in 2020.

BACKGROUND

Illegal dumping can result in significant impacts on the environment, wildlife, human health, and communities, and is a considerable financial burden on local governments, businesses and residents. Metro Vancouver and its member jurisdictions have focused on planning, prevention and enforcement efforts to mitigate illegal dumping.

At its January 22, 2021 meeting, the Zero Waste Committee requested more information about illegal dumping in Metro Vancouver. This report provides an update on regional illegal dumping trends and local government initiatives to discourage illegal dumping.

ILLEGAL DUMPING TRENDS AND PROGRAMS

Metro Vancouver supports member jurisdictions by facilitating data collection, information sharing and collaboration. Metro Vancouver also developed a region-wide campaign, *Waste in Its Place*, to educate residents on legal recycling, donation and disposal options in their communities to help decrease illegal dumping activity. Metro Vancouver provides convenient and accessible recycling and waste drop-off services at its recycling and waste centres. Member jurisdictions manage the clean-up of illegally dumped items, and implement a range of prevention initiatives and enforcement actions.

Illegal Dumping Monitoring and Reporting Efforts

Over the past five years, some member jurisdictions have made changes to their data collection process and monitoring approach that have helped improve reporting of illegal dumping activity including:

- Upgrades to public reporting software
- Expanded use of mobile devices to track and report incidents and create work orders
- Tracking illegal dumping of household garbage in parks garbage containers
- New tracking sheets clarify the difference between litter and illegal dumping
- Additional staff in the field reporting illegal dumping activity
- Improved location data

Some of the increases in the number of incidents recorded may simply be a result of improved reporting practices, such as the introduction of online reporting tools, rather than a true increase in illegal dumping activity.

2020 Illegal Dumping Trends

In 2020, approximately 47,000 illegal dumping incidents were reported by member jurisdictions in Metro Vancouver. Data from 2015 to 2020 shows an overall increase in the annual number of incidents (Table 1). Despite this overall increase in incidents, some municipalities reported a decrease in the number of incidents in their communities. These decreases may be attributed to initiatives like large item pick-up programs, community drop-off events, and increased monitoring and enforcement.

Table 1: Annual Incidents and Costs of Illegal Dumping in the Region

Year	Number of Incidents	Total Clean Up Cost*	Average Cost Per Incident
2015	35,300	\$2.74 million	\$78
2016	37,000	\$2.51 million	\$68
2017	39,500	\$3.16 million	\$80
2018	43,800	\$3.40 million	\$78
2019	43,450	\$3.50 million	\$81
2020	47,050	\$3.63 million	\$77

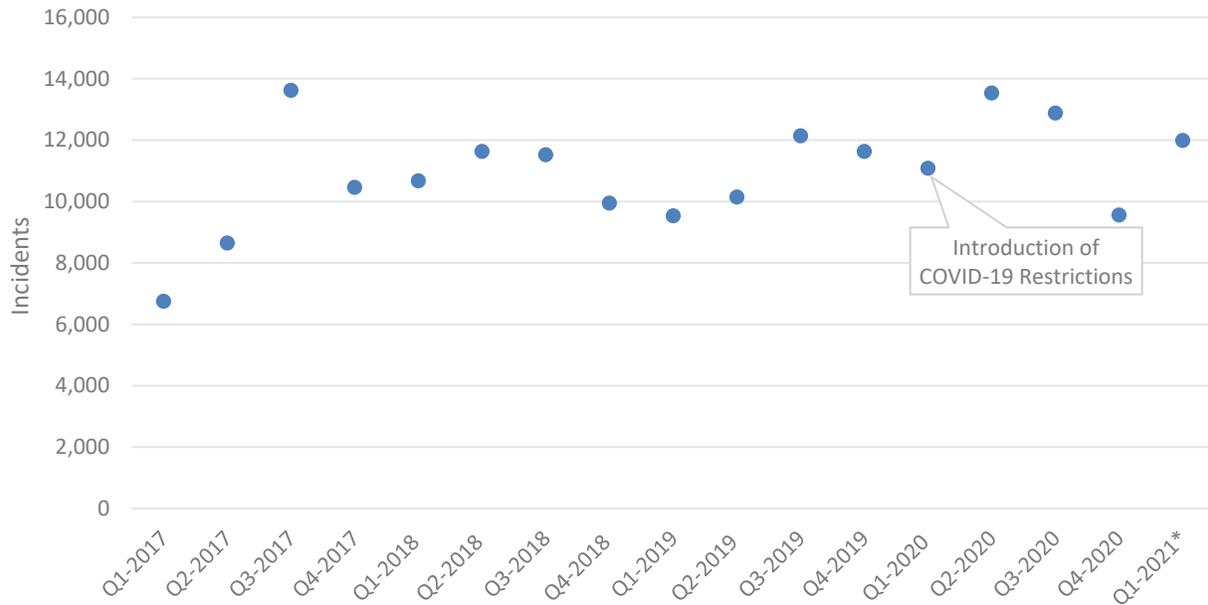
*Total clean-up cost for City of Vancouver includes cost of investigations

Municipalities report spending approximately \$3.6 million on the removal and disposal of illegally dumped items. Overall costs of illegal dumping have increased across the region by on average 4.7% per year over the last three years. In addition, it is estimated that municipalities collectively spend \$2.5 million per year on large item pick-up programs to allow residents to dispose of bulky items conveniently.

Mattresses, furniture, household garbage, yard trimmings, gypsum, scrap metal, appliances, hazardous household items, electronics and construction materials were the most frequently abandoned items, as reported by municipalities in 2020.

In March 2020, when COVID-19 restrictions were implemented across the region, the number of illegal dumping incidents decreased temporarily. The number of incidents increased in the summer of 2020 and stabilized towards the beginning of 2021 (Figure 1).

Figure 1: Illegal Dumping Activity in Metro Vancouver

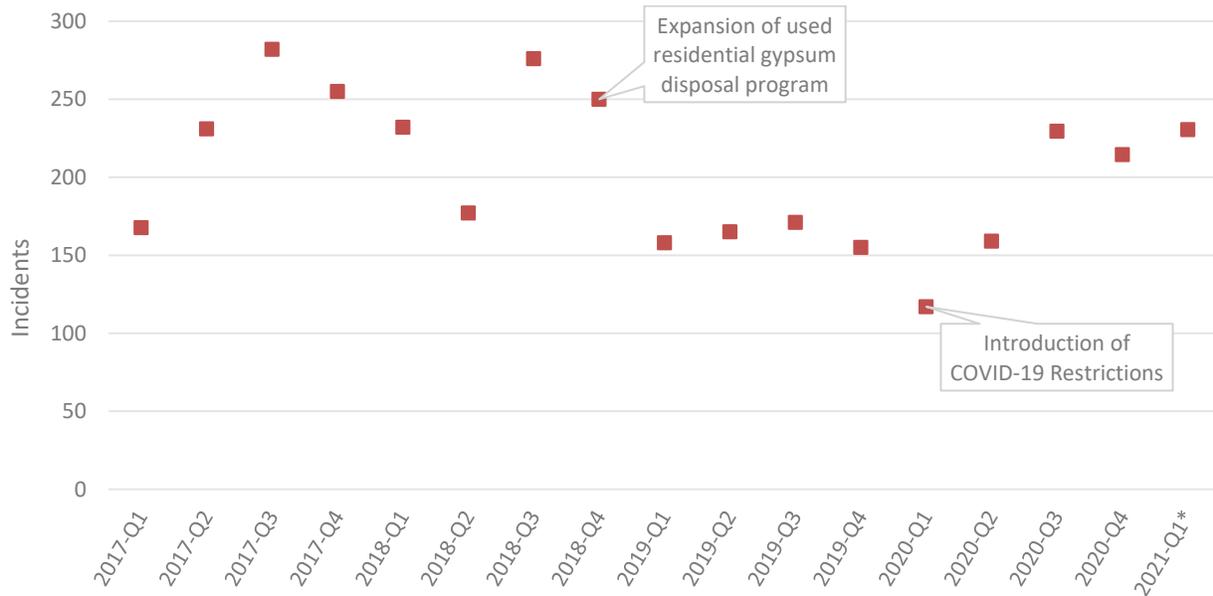


Abandoned Gypsum

Illegally-dumped gypsum is problematic as it may contain asbestos. Asbestos-containing materials represent a health risk to workers and the general public, and is expensive to remediate and dispose of.

Metro Vancouver piloted a residential used gypsum disposal program in the fall of 2016 at the Langley and Maple Ridge recycling and waste centres to provide a safe and convenient option for residents to dispose of small quantities of used gypsum without requiring a laboratory test for asbestos. From 2018 to 2019 abandoned gypsum incidents decreased approximately 31% (Table 2). This decrease coincided with the expansion of the used gypsum program to all regional solid waste facilities including the Vancouver Landfill in late 2018 (Figure 2). New gypsum that has never been installed is also accepted for recycling at all regional solid waste facilities.

Figure 2: Abandoned gypsum in Metro Vancouver



In 2020, member jurisdictions reported approximately 720 incidents of abandoned gypsum, an 11% increase from 2019. Table 2 shows annual number of incidents of abandoned gypsum from 2016 to 2020. Unlike general illegal dumping, gypsum clean-up costs reduced initially at the beginning of the pandemic, and increased later in the year.

Table 2: Annual Incidents of Abandoned Gypsum in the Region

Year	Number of Incidents
2016	628
2017	936
2018	935
2019	649
2020	720

In March 2020, the number of incidents decreased temporarily, coinciding with the onset of the COVID-19 restrictions, and increased in subsequent months (Figure 2).

Municipal Illegal Dumping Enforcement Actions

Illegal dumping is regulated through municipal bylaws, and administrative penalties are typically set in municipal ticketing bylaws. In 2020, enforcement actions taken by member municipalities (based on the ten municipalities that reported data) included 963 investigations, 374 warnings, 29 municipal tickets or bylaw notices, and 3 “clean and bill” charges (municipal crews clean up and recover the cost from the owner). Some municipalities also have monitoring cameras in place and have increased enforcement patrols in areas with high illegal dumping incidences.

A key challenge for advancing enforcement action is the collection of evidence, such as good quality video/photos, witness reports and personal contact information found in abandoned waste. A combination of increased monitoring, use of signage and enforcement practices including issuing tickets, has been effective in reducing illegal dumping in some municipalities.

Municipal Initiatives for Illegal Dumping Prevention

In addition to enforcement practices, municipalities have implemented initiatives to discourage illegal dumping, such as signage, large item pick-up programs, restricted access to known illegal dumping sites, addition of streetscape recycling bins, education campaigns, expansion of accepted items at recycling depots and drop-off events. In 2020, some of these activities were cancelled or modified due to COVID-19 restrictions.

Illegal Dumping Municipal Workshop

On July 8, 2021, Metro Vancouver hosted a workshop with member jurisdictions and neighbouring regional districts/municipalities to provide an opportunity for municipal solid waste staff to learn from each other and engage in dialogue about enforcement actions and prevention initiatives.

The workshop presentations from Metro Vancouver outlined recent trends in illegal dumping activity in Metro Vancouver and the 2021/22 *Waste in Its Place* education campaign. Invited presentations from the City of Richmond, City of Chilliwack and Fraser Valley Regional District described municipal programs, clean-up efforts, and operational and communications strategies to discourage illegal dumping. A key finding from the City of Chilliwack is that residents assume disposal of large items is expensive, and that this can easily be resolved by translating fees from \$/tonne to \$/kilogram. Staff are already putting this workshop learning into action by developing an online tool that will help Metro Vancouver residents better understand the cost of proper disposal for commonly dumped items like couches and yard waste.

Additional topics and opportunities discussed at the workshop:

- Prevalence of illegal dumping region wide
- Challenges associated with monitoring remote areas
- Importance of involving the community and empowering volunteer groups
- Access to disposal options, such as large item pick-up programs and free tipping passes
- Innovative, centralized tools for data collection and monitoring
- Need for more standard data reporting and clear definitions of categories for reporting illegally dumped items
- Collaboration on education and messaging on proper disposal options
- EPR programs for commonly reported abandoned waste

Input provided by workshop participants is helping inform subsequent supportive actions to be taken by Metro Vancouver related to data collection and information sharing on illegal dumping in the region.

Next steps

Metro Vancouver will explore emerging opportunities identified at the workshop to enhance collection of regional data, develop and host tools to estimate cost of disposal and continue to advocate for expanded producer responsibility programs for commonly dumped materials such as mattresses and furniture.

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 municipalities and private land owners.

CONCLUSION

In 2020, approximately 47,000 illegal dumping incidents were reported by member jurisdictions in Metro Vancouver, with an associated clean-up cost of \$3.6 million. In addition, it is estimated that municipalities collectively spend \$2.5 million per year on large item pick-up programs. Despite an overall increase in illegal dumping activity, cleanup costs have remained relatively stable over time.

Illegal dumping continues to be a problem across the region. A key challenge for advancing enforcement action is the collection of evidence. At the illegal dumping municipal workshop hosted by Metro Vancouver, empowerment of volunteer groups, access to disposal options, improved data collection and monitoring, collaboration on education, EPR programs for commonly abandoned items and communication of disposal costs in more relatable units were identified as key areas to focus on to further reduce illegal dumping.

Metro Vancouver continues to facilitate information sharing and will work with member jurisdictions to explore further strategies to reduce illegal dumping in the region.

46688211

To: Zero Waste Committee

From: Maria Lo, Project Engineer, Solid Waste Services

Date: September 2, 2021 Meeting Date: September 10, 2021

Subject: **Continuous Improvement, Innovation, and Collaboration with Adjacent Regional Districts**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated September 2, 2021, titled “Continuous Improvement, Innovation, and Collaboration with Adjacent Regional Districts”.

EXECUTIVE SUMMARY

Metro Vancouver applies continuous improvement and innovation to consistently increase the value and effectiveness of its facilities, services, and business processes. In 2021, several continuous improvement initiatives have been implemented resulting in both cost savings and enhanced services. Examples of recent innovations include the recycling depot funding strategy, organics management contracts and modernization of weigh scale software systems. Metro Vancouver collaborates with adjacent regional districts to share information and partner on waste reduction projects. A number of foundational studies are underway to support the development of an updated solid waste management plan. To help answer questions posed by Zero Waste Committee members, Metro Vancouver will initiate a new study to assess options to manage residual garbage.

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

As requested by the Zero Waste Committee, this report highlights some of the continuous improvement and innovation initiatives within the solid waste function in 2021.

CONTINUOUS IMPROVEMENT & INNOVATIONS

Solid Waste Services engages in continuous improvement, which is an ongoing effort to improve our facilities, services, and business processes. It also engages in innovation, which is the application of new solutions to meet new and existing needs. 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.

Continuous Improvement in Solid Waste Operations

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

In 2021, highlights include:

-
- Implementation of a new recycling depot funding strategy that incorporates the cost of recycling depots located at Metro Vancouver's recycling and waste centres into the garbage tipping fees. It provides an annual garbage tipping fee credit to municipalities operating municipal recycling depots. This change in funding strategy accommodates future recycling depots while reducing municipal costs by over \$1 million per year.
 - New contracts for organics management for regional recycling and waste centres. The new contracts save the region approximately \$2 million per year, minimize greenhouse gas emissions by exploiting backhaul opportunities, and increases the regional organics management system's resiliency by contracting with more than one organics processor.
 - Modernization of weigh scale software to increase efficiency and convenience while reducing potential errors. New features will include automated license plate recognition, enhanced disposal ban reporting, and electronic invoicing.

Innovation towards Zero Waste

Solid Waste Services periodically identifies and assesses innovative ideas for improving the efficiency of its key functions and services. It also explores innovative solutions to meet new requirements or existing needs.

In 2021, highlights included:

- A Metro Vancouver partnership with the City of Burnaby on the smart bin pilot, which assessed the benefits and limitations of using artificial intelligence-enabled sensors to identify banned items and fullness levels in garbage dumpsters. The sensors had an overall success rate of 43% at identifying banned items in their repertoire and an 88% correlation with the human auditor at measuring fullness levels.
- A scan of additional global innovations and their applicability to our region is currently underway through the Circular Economy and 3Rs study. The consultant team is looking into all types of innovations, including policy and regulation, education and behaviour change, business models, and technology. Results from the study are anticipated for the end of 2021 and will be reported to the Zero Waste Committee.

Future Areas of Focus

The future 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 the Circular Economy and 3Rs study, the bottom ash beneficial use initiative, and the alternative fuel and recyclables recovery procurement process.

Metro Vancouver typically seeks technologies that have demonstrated success at a full commercial scale for general operations. Emerging technologies for processing mixed waste (residential and commercial/institutional municipal solid waste, often described as "black bag garbage") are inherently high risk. North American and international experience shows that these initiatives have an extremely high rate of failure.

Committee members have expressed interest in better understanding opportunities for innovation concerning the processing of residual garbage. To better understand those opportunities, Metro Vancouver will start a review of options to manage garbage. The review will be initiated through a

procurement process to select an engineering consulting firm. It will include both mainstream and emerging technologies and provide information in the following areas:

- The extent of use of technology in North America, Europe and world-wide
- Literature review of comparisons between technologies
- Qualitative assessment of relative characteristics of options: cost, risk, scalability, public perception, environmental considerations etc.

The aim of the review is to provide foundational information that will support the solid waste management plan update conversations rather than rank options.

Collaboration with Adjacent Regional Districts

Metro Vancouver continues to collaborate and share information with adjacent regional districts and communities to advance waste reduction. Examples of collaboration with neighbouring regional districts include:

- Exploring opportunities for co-digestion of food waste with biosolids at a waste-water treatment plant with a municipality in an adjacent regional district.
- To rescue and redistribute surplus food, Metro Vancouver participates in a food recovery network the Fraser Valley Regional District also participates in.
- Metro Vancouver facilitates information sharing with member jurisdictions and neighbouring communities through groups such as the Municipal Waste Reduction Coordinators Committee and events such as the illegal dumping workshop. The workshop attracted attendees outside the region, including the Fraser Valley Regional District, Chilliwack, Abbotsford, Whistler, Squamish, and Sechelt. Metro Vancouver was inspired by the City of Chilliwack's web-based waste disposal cost calculator at the illegal dumping workshop and plans to develop a similar tool. City of Chilliwack staff indicated the simple web-based calculator supports conversations with the public related to estimating disposal costs for small loads of various materials.

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 2021 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. By staying current with the rapid advancements in policy and regulation, education and behaviour change, business models, and technology, Metro Vancouver is well-positioned to utilize available tools to move the region towards a circular economy and advance waste reduction.

To: Zero Waste Committee

From: Karen Storry, Senior Engineer, Solid Waste Services

Date: September 2, 2021 Meeting Date: September 10, 2021

Subject: **2021 Reuse and Repair Initiatives Update**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated September 2, 2021, titled “2021 Reuse and Repair Initiatives Update”.

EXECUTIVE SUMMARY

As local governments and businesses grapple with global challenges such as waste reduction, climate change and ocean plastics, reuse and repair initiatives provide an attractive solution. Clothing, household goods, takeout containers, and bags continue to be key sectors for reuse and repair in the region. In addition, the role of reuse in the built environment is an emerging area of interest for waste reduction and climate action. Metro Vancouver continues to help advance reuse and repair initiatives through data collection, information sharing and behavior change campaigns. Although implementation of further reuse and repair initiatives was put on pause in 2020/2021 due to COVID-19 restrictions, planning for the future continued. An expanded pilot for reuse education at regional recycling and waste centres and several regionally supported repair events are anticipated for 2022.

PURPOSE

To provide the Zero Waste Committee with an update on reuse and repair initiatives in the region.

BACKGROUND

At its January 22, 2021 meeting the Zero Waste Committee endorsed the work plan as presented in the report dated January 14, 2021, titled “2021 Zero Waste Committee Priorities and Work Plan”. The work plan includes an update on regional reuse and repair initiatives.

REUSE AND REPAIR

Reuse and repair is an increasing area of interest for not only Metro Vancouver and our member jurisdictions, but also for businesses. As we all grapple with global challenges such as waste reduction, climate change and ocean plastics, reuse and repair provides an attractive solution. Reusing and repairing the items we already have is often the lowest cost and lowest carbon option. As businesses explore circular economy business models such as rental and resale, reuse and repair also provides new business opportunities.

The following sections summarize key sector trends and Metro Vancouver work in reuse and repair.

Clothing and Household Goods

While some donation centres put a pause on donations, Metro Vancouver solid waste facilities continued to collect books, second hand clothing and gently used household goods for donation

throughout the pandemic. This provided an important option for residents that were moving or had limited ability to store donations until other options opened back up. The thrift store sector has not only bounced back to pre-pandemic levels; but fashion brands have also started to look at their role in resale. In 2021, two of the largest locally-based outerwear brands launched clothing resale platforms.

Reusable Bags, Cups, and Containers

The National Zero Waste Council report titled *Opportunities for Reusables in Retail Settings During the COVID-19 Pandemic in Canada*, provided a science-based analysis to confirm that people bringing and using their own cups and reusable bags in to shops and cafes does not have a significant risk of transmitting communicable diseases such as COVID-19. Findings of this report were corroborated by this BC Centre for Disease Control June website update:

“COVID-19 transmission from handling reusable containers such as grocery bags, coffee mugs, dollar bills, coins, bulk bins and other reusable items HAS NOT BEEN DOCUMENTED. Because the risk is LOW, premises may go back to normal activities as long as COVID safety measures known to reduce overall risk are maintained.”

This work is critical to restoring businesses’ and residents’ confidence in using reusable bags, cups and containers. As the Government of BC continues to advance restart plans, we are seeing a return of reusable bags and cups being used by residents at local retailers.

In 2021, we also saw the launch of two new reusable container and cup share businesses in the region. These businesses are important to accelerate reuse because they provide a convenient alternative for residents; and overcome the limitations related to the *BC Food Safety Act* requirements for personal containers. Under the current regulations, customers can use their personal containers for leftovers at their table, but restaurants must wash any personal containers before placing food directly into them. Work to develop safe procedures for restaurants to allow for filling of personal containers was put on pause during the pandemic, but is expected to resume now that health authorities are better positioned to address non-pandemic priorities.

To further advance reusable bag, cup and container use, Metro Vancouver is working with member jurisdictions and the Ministry of Environment and Climate Change Strategy on harmonization of municipal single-use item bylaws.

The Built Environment

The built environment, which includes all man-made structures, is one of the most material and carbon-intensive sectors. A key strategy to reduce materials and carbon in the built environment is reuse. A recent report by the Pacific Institute for Climate Solutions found reuse of existing building stock is almost always more effective in reducing climate impacts than new energy-efficient construction. In step with these findings, recent updates to Metro Vancouver’s construction and demolition toolkit included an increased emphasis on reuse. The updated toolkit includes house moving and salvage as preferred alternatives to recycling.

Metro Vancouver Behaviour Change Campaigns

Behaviour change campaigns continue to be an important activity for Metro Vancouver to encourage reuse and repair.

- *Think Thrice* helps residents with easy clothing repairs and encourages them to buy second hand where possible.
- *Love Food Hate Waste* provides chef-inspired ideas on how to transform food that would otherwise be wasted into delicious meals, and to prevent food waste through better storage and planning.
- *Create Memories Not Garbage* inspires people to use reusable gift wrap, give experiences instead of items that create waste, and give lasting durable gifts.
- *Superhabits* reminds residents to bring their reusable items as it is “our small daily routines will save the day”.

Reuse Days at Metro Vancouver Recycling and Waste Centres

Metro Vancouver hosted a trial reuse education day at the North Shore Recycling and Waste Centre in June 2019. Volunteers from our reuse partner, Urban Repurpose, collected 3,540 lbs (1,609 kg) of resalable goods. Items collected included a vintage teak lamp, books, bed frames, and lumber. Residents were surprised to learn materials they were dropping off as waste or recycling could be given a second life and encouraged staff to hold the event more often. Staff are working to expand on the 2019 trial with a pilot at the North Shore Recycling and Waste Centre starting in the spring of 2022. If the pilot is a success, the long term goal will be to find more reuse partners and build capacity to do the events at as many regional facilities as possible.

Community Repair Events

A handful of community repair events were held during the pandemic. While most were held virtually, some communities were able to host a few in-person outdoor events with limited attendance. Most communities are waiting for COVID-19 restrictions to be lifted as it is difficult to replicate the volunteer-community member interaction and the overall community building benefits of the repair events in a virtual setting. Some communities are already planning for repair events to start later this year. Metro Vancouver is working with municipal staff to develop a joint funding model to help encourage more events throughout the region. As a result, an increased number of repair events are anticipated for 2022. These events will help residents access repair and reuse events to fix a variety of items such as small appliances, electronics and clothing.

Measurement

In 2017, Metro Vancouver published its first high-level estimate of reuse in the region. It is estimated that 87,500 tonnes of material was reused in the region in 2019, a slight increase from the 2017 estimate of 82,000 tonnes. Examples of reused materials include donated or resold clothing, certain minimally-processed EPR materials, donated foods, reused furniture and office equipment, salvaged building materials and other items bought and sold which prevented the need to purchase new items. Reuse in the region is estimated by using data from registered charities’ financial statements, EPR annual reports, published information from reuse program web pages, statistical information and communications with key organizations in the second-hand clothing industry, hospitality sector, food rescue organizations and average number of goods exchanged via online marketplaces. Staff continue to work on expanding and improving the regional reuse estimate. In 2021, Metro Vancouver hired a

UBC Regional Scholar to review the current method and identify potential opportunities for improvement.

In addition to the trends and Metro Vancouver work summarized above:

- The Circular Economy and 3Rs initiatives study is underway. The study will identify reuse and repair initiatives in other jurisdictions that could further advance reuse and repair in the Metro Vancouver region.
- To advance food reuse in the region, Metro Vancouver has procured services from FoodMesh to further develop the regional food recovery network. A more detailed summary of this work is in the Manager's Report.

ALTERNATIVES

This in an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Metro Vancouver initiatives described in this report are accommodated within the annual Solid Waste Services budget.

CONCLUSION

Reuse and repair provide an attractive solution to global challenges such as waste reduction, climate change and ocean plastics. Clothing, household goods, takeout containers and bags continue to be key items for reuse and repair in the region. In addition; the role of reuse in the built environment is emerging as a key area of interest. Metro Vancouver continues to help advance reuse and repair through data collection, information sharing and behavior change campaigns. Planning for reuse and repair continued in 2020/2021, though implementation was limited by pandemic restrictions. An expanded pilot for reuse education at recycling and waste centres, as well as increased repair events are anticipated for 2022.

References

1. [Making Embodied Carbon Mainstream \(Pacific Institute for Climate Solution\)](#)

46733788

To: Zero Waste Committee

From: Heather Schoemaker, General Manager, External Relations
Ann Rowan, Division Manager, Collaboration and Engagement, External Relations

Date: August 3, 2021 Meeting Date: September 10, 2021

Subject: **2021 Update on National Zero Waste Council Activities**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated August 3, 2021 titled “2021 Update on National Zero Waste Council Activities.”

EXECUTIVE SUMMARY

In 2021, the National Zero Waste Council has a number of projects and initiatives that will advance waste prevention and circularity within Metro Vancouver and across Canada. Included is the Council’s foundational work in reducing food waste across the value chain and by households and developing pilot projects to divert asphalt and wood waste while working collaboratively to champion a circular economy for plastics packaging and the creation of circular cities and regions in Canada. Research analyzing the public health risks of reusables, confirmed the switch to single use items during the pandemic was not warranted. By being strategic and effective in identifying areas of work, the Council has been able to leverage external funding expanding the capacity of the Council to deliver on its objectives - \$200,000 in 2021 to advance the Council’s work in the circular economy and food loss and waste and \$371,500 in campaign partner service fees for Love Food Hate Waste Canada.

PURPOSE

To provide an update on the initiatives and projects of the National Zero Waste Council since the beginning of 2021.

BACKGROUND

Created in 2013 to enable cross-sector collaboration in advancing waste prevention and accelerating the transition to a circular economy across Canada, the Council is a leadership initiative of Metro Vancouver. The Council convenes and connects with leaders in waste prevention from the public and private sectors across Canada to advance initiatives and projects that catalyze effective action in waste prevention and circularity. The Council, through relationships with thought-leaders from global organizations and jurisdictions engaged in accelerating the transition to a circular economy, seeks to inform and align its work with “cutting edge” and effective initiatives.

NATIONAL ZERO WASTE COUNCIL – 2021 UPDATE

The Council is a cross-sectoral collaboration of 170 members coming from jurisdictions, businesses and NGOs from across Canada who share a common commitment to prevent waste and to accelerate a transition to a circular economy. The Council has two active working groups, composed of members

of the Council, who undertake pilot projects and preliminary research. This complements the work of other projects initiated and led by Secretariat staff as part of an approved annual work plan.

Since the beginning of 2021, there have been several important accomplishments and new projects initiated that are summarized below.

Reusables during the Pandemic: The growing trend in the use of reusables had been disrupted during the pandemic. Food retailers adopted a range of policies, often limiting the use of reusable bags, mugs, containers, and bulk food. In response, the Council's Product, Design and Packaging Working Group approached a research team at the University of Toronto's Dalla Lana School of Public Health to learn more about the science behind the risks of using reusables. The result was a report *Opportunities for Reusables in Retail Settings During the COVID-19 Pandemic in Canada: A Review of Guidance and Evidence*.

Their conclusions, based on a scan of scientific research on virus transmission, was that as long as precautions remain in place (like hand washing), reusable items may be used in retail settings during the COVID-19 pandemic. Just this month, the BC Centre for Disease Control updated their guidelines indicating that food businesses may go back to normal activities when handling reusable containers as long as COVID safety measures are maintained. The challenge now is to recover the momentum of the switch to reusables from single use products before the pandemic – this will involve changing the attitude of retailers as well as consumers. The research supports Metro Vancouver's Super Habits campaign.

A webinar on the topic of reusables involving both the research team as well as important leaders in the retail sector was held on June 24 with over 130 participants. The report and recording of the webinar is available on the Council website.

Construction and Demolition Waste: Effective action on waste prevention requires good data. The Recognizing this need, the Council's Construction, Renovation and Demolition Working Group of the Council undertook work to support a new waste database and analysis report.

The report, *Watching our Waste: A National Construction Waste Analysis in Canada Using LEED Certified Project Data* was authored by Light House, who collected and analyzed construction and demolition (C&D) waste data from LEED projects across Canada. They compared that information to best practices in the industry and concluded that much higher diversions rates across the construction industry are possible.

A video has also been produced that highlights efforts to advance wood waste diversion across Canada is available on the Council website.

Canadian Plastics Pact (CPP): The National Zero Waste Council played a pivotal role in the formation and launch of the CPP which brings together a diverse set of leaders and experts in the national plastics value chain to collaboratively change the way we design, use, and reuse plastic packaging. This will involve goal setting, piloting and innovating new technical, policy and legislative solutions to the barriers. Metro Vancouver and the Council will play a key role in the implementation of the pact and key policy actions of relevance to Metro Vancouver zero waste priorities.

On July 22, 2021, 21 Canadian retail and consumer packaged goods companies announced their support for the Golden Design Rules for Plastic Packaging released by the Consumer Goods Forum Coalition of Action on Plastic Waste. The nine Golden Design rules provide a framework to drive innovation and scalable actions that should result in less plastic packaging overall and easier to recycle plastic packaging by 2025. The CPP will lead the consultation and implementation of the Golden Design Rules in Canada. The National Zero Waste Council welcomes the Golden Design Rules as an important step toward a circular economy for plastics packaging.

Food Loss and Waste: The Council’s work on food loss and waste prevention continues to evolve both through commissioned research and the ability to convene and connect important stakeholders in the food value chain progresses. The Council has a seat on Canada’s National Food Policy Council – an important venue for building support for important actions identified in *A Food Loss and Waste Strategy for Canada*. New collaborative research into circular food systems will identify opportunities to advance circular food practices on-the-ground and will support the growth of circular food systems across Canada.

Through the Love Food Hate Waste Canada campaign, the Council brings jurisdictions and food retailers across Canada into a proven behaviour change campaign focused on reducing household food waste. In 2021, a new “Five Ways with” campaign was rolled out in both official languages to help Canadians rethink avoidable food waste. The campaign gives Canadians easy to implement storage and usage tips on commonly wasted household food items and is being delivered digitally through online ads.

Circular Cities and Regions Initiative (CCRI): The CCRI is a one-year national pilot project developed by the National Zero Waste Council, Federation of Canadian Municipalities, Recycling Council of Alberta, and RECYC-QUÉBEC to advance circular economy knowledge sharing and capacity building in the Canadian local government sector. As part of the initiative, five webinars will be delivered that will enable knowledge sharing from the Ellen MacArthur Foundation, Zero Waste Scotland and other global leaders in the creation of circular cities. Two webinars have been delivered and the next one, *Addressing Global Challenges through Innovative Place-based Solutions*, is scheduled for September 15. See the Council website – nzwc.ca - for details.

A second key program component is the Peer-2-Peer (P2P) network that will enable a pilot of communities to benefit from cohort learning and exchange. The communities involved in this pilot will have access to one-on-one support by the CCRI team and other strategic and global advisors to support them in their journey towards circularity and will culminate in the development of circular economy roadmaps for each community. On June 15, 2021, the fifteen local governments to the P2P network were announced and included the cities of Richmond and Vancouver.

LEVERAGING SUCCESS

Core funding for the National Zero Waste Council is provided by Metro Vancouver; since its launch in 2013 this has been in the form of a budget for in-kind services (2 staff salaries) \$120,700 for project development, translation and administrative expenses.

Over the past three years, there has been an emphasis on attracting external project funding to amplify and expand the work of the Council. The Council has been successful in terms of raising funds for the Love Food Hate Waste Canada campaign, work to reduce food loss and waste throughout the supply chain and for work advancing the transition to the circular economy. On average, the annual amount raised from external sources has been \$500,000; this includes about \$350,000 in service fees collected from project partners in the Love Food Hate Waste Canada campaign.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The 2021 budget for the National Zero Waste Council is \$434,354, including salaries for two staff and project development funding of \$120,700. In addition, leveraged funding from external project partners is projected to be just under \$200,000 to advance the Council's work in the circular economy and food loss and waste.

Love Food Hate Waste Canada, a self-sustaining program of the Council is funded by service fees from its campaign partners that directly support the development of communications and marketing campaigns, creative materials for the web, social media, and activation initiatives and to leverage the reach of campaign ambassadors and market influencers. The LFHW budget in 2021 is projected to be \$371,500.

CONCLUSION

In 2021, the National Zero Waste Council has a number of projects and initiatives that will advance waste prevention and circularity within Metro Vancouver and across Canada. The Council continues to do foundational work in reducing food waste across the value chain and by households and developing pilot projects to divert asphalt and wood waste while working collaboratively to champion a circular economy for plastics packaging and the creation of circular cities and regions in Canada. Research analyzing the public health risks of reusables, even during the COVID 19 pandemic confirmed that the switch to single use items was not warranted and that, as long as precautions remain in place (like hand washing), reusable items may be used in retail settings. By being strategic and effective in identifying areas of work, the Council has been able to leverage the Metro Vancouver contribution to the Council to raise funds from external sources which expands the capacity of the Council to deliver on its objectives.

References:

1. National Zero Waste Council website www.nzwc.ca
2. [*Opportunities for Reusables in Retail Settings During the COVID-19 Pandemic in Canada: A Review of Guidance and Evidence.*](#)
3. [*Watching our Waste: A National Construction Waste Analysis in Canada Using LEED Certified Project Data*](#)
4. [*Opportunities to Upcycle Wood Waste Across Canada - video*](#)
5. [Canada Plastics Pact](#) website
6. [*A Food Loss and Waste Strategy for Canada*](#)

7. [Love Food Hate Waste Canada](#) website
8. [Circular Cities and Regions Initiative](#) website
9. [Addressing global challenges through innovative place-based solutions webinar](#)

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To: Zero Waste Committee

From: Heather Schoemaker, General Manager, External Relations
Ann Rowan, Division Manager, Collaboration and Engagement, External Relations

Date: August 31, 2021 Meeting Date: September 10, 2021

Subject: **2021 Zero Waste Conference Update**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated August 31, 2021, “2021 Zero Waste Conference Update.”

EXECUTIVE SUMMARY

The 2021 Zero Waste Conference, taking place October 28, promises to be a full day of dynamic, curated programming bringing together keynote speakers and panelists who will challenge participants to create a resilient, carbon neutral and circular future through inspiring stories of changes and initiatives already underway and encouragement to take the bold steps required in transformative times. The primarily virtual Conference will be co-hosted by Metro Vancouver and the National Zero Waste Council and broadcast from the multimedia studio at the Annacis Research Centre with the opportunity for a small in-studio audience as BC navigates its restart

The overarching theme of the Zero Waste Conference is a “*Future without Waste*”. This year’s subthemes are:

Unlock the power of imagination and transformation
Step into creative and innovative thinking
Design a resilient, carbon neutral and circular future

PURPOSE

This report provides an update on the planning for the 2021 Zero Waste Conference.

2021 ZERO WASTE CONFERENCE

The annual Zero Waste Conference, hosted by Metro Vancouver and the National Zero Waste Council, supports the first two goals of the *Integrated Solid Waste and Resource Management Plan* related to waste prevention. The Conference, in its eleventh year, has become a fixture on Metro Vancouver’s calendar attracting interest from all orders of government, the business sector, sustainability practitioners and academia within the region and across Canada.

Planning for the Conference begins early in the year and given uncertainty about what the COVID 19 pandemic situation would be like and the public health officer’s guidance on public gatherings, two decisions were made early on. First, that this year’s conference would once again be virtual with the opportunity for a small in-studio audience as BC navigates its restart plan. The second decision, given the Conference would primarily be virtual, was that it would be a one-day conference as opposed to

the previously planned move to a two-day event. The 2021 Zero Waste Conference will be held on October 28th and will be broadcast from the multimedia studio at the Annacis Research Centre.

In alignment with the conference, the National Zero Waste Council hosts its Annual General Meeting the day prior to the conference allowing Council members to also attend the conference. The 2021 Zero Waste Conference is also bookended by two important global conferences. The 2021 World Circular Economy Forum (WCEF) is scheduled for September 13 to 15 in Toronto and the Conference of the Parties (COP) 26 UN Climate Change Conference will take place from October 31 to November 12 in Glasgow, UK. In response, we have taken this opportunity to develop a program that integrates the transition to a circular economy with climate action and building resilience.

Program

The overarching theme of the Zero Waste Conference is a “*Future without Waste*” with an annual set of subthemes that define the rich experience participants have come to expect. This year the subthemes are:

Unlock the power of imagination and transformation
Step into creative and innovative thinking
Design a resilient, carbon neutral and circular future

The Conference will showcase a curated program of high caliber keynotes and panelists who together are inspiring, thought-provoking, providing success stories from the marketplace to decision-tables. Attachment 1 provides an overview of the preliminary program for the 2021 Conference. The Conference website, www.zwc.ca, provides additional information on the program, sessions and speakers.

Marketing

The conference has become a must-attend for many return participants and benefits from a robust marketing strategy, engaging multiple partners and stakeholders locally, nationally and globally. Included are a blend of print and digital media, association notice boards and newsletters and creative networking through Metro Vancouver and the National Zero Waste Council and key affiliated networks and associations such as the Federation of Canadian Municipalities and Circular Economy Leadership Canada

Registration

Last year, just over 500 people attended the Zero Waste Conference. This year we are projecting 600 registrants. Registration fees for virtual participants are \$150 with an early bird rate of \$100 that was in place until the end of July. In addition, we offer students a registration fee of \$89. For the small number of individuals who will be able to watch the conference in the studio, registration will be \$300.

As in prior years, the registration fees are waived for members of the Metro Vancouver Board and the Zero Waste Committee. An email providing more information on the registration process for Board and Committee members will be distributed by September 15th.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The projected cost to host the 2021 Zero Waste Conference is \$301,950 supported through the 2021 General Government Program of \$212,000 and \$89,950 from conference registration fees.

CONCLUSION

The annual Zero Waste Conference, hosted by Metro Vancouver and the National Zero Waste Council, supports the first two goals of the *Integrated Solid Waste and Resource Management Plan* related to waste prevention. Given the uncertain nature of organizing a public event during the COVID 19 pandemic, the 2021 Zero Waste Conference will again be a virtual event, taking place October 28th and broadcast from the multimedia studio at the Annacis Research Centre.

The program for the 2021 Conference is designed to bring together important threads for this moment when significant transformations is urgent. We are slowly emerging from a global pandemic at the same time that the impacts of climate change and the problem of waste resources are more evident. The curated program of speakers and panelists integrates the transition to a circular economy with climate action and building resilience.

Attachment:

Tentative Program for ***2021 Zero Waste Conference: A Future Without Waste***

Reference:

[2021 Zero Waste Conference](#)

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2021 Zero Waste Conference: A Future Without Waste

Unlock the power of imagination and transformation

Step into creative and innovative thinking

Design a resilient, carbon neutral and circular future

For **11 years**, the Zero Waste Conference has been at the forefront of Canada's circular economy journey bringing together thought leaders, innovators and change makers, surfacing some of the best ideas from the past while presenting pioneering solutions that take us to a future we've only begun to dare dream is possible.

As the world faces unprecedented challenges, we are more committed than ever to accelerating the transition to a circular and zero waste economy, creating solutions that combine economic opportunity with benefits to wider society and the environment.

Join us at this year's Zero Waste Conference to explore the ideas and actions with the greatest potential to transform our communities and economies in support of a future without waste.

Preliminary Program – subject to change

8:30 Conference Kickoff

- Opening Video – A Ten Year Journey

8:35 Welcoming Remarks

- Sav Dhaliwal, Chair, Metro Vancouver Board
- Province of BC

UNLOCK THE POWER OF IMAGINATION AND TRANSFORMATION

8:45 Opening Keynote Armchair Discussion – Unlocking the Future

- Shivvi Jervis, Futurist and Founder of FutureScape 248 (invited)
- Gerd Leonhard, Futurist and CEO of The Futures Agency (invited)

9:30 Innovation Showcase

- Safia Qureshi, CEO & Founder, CLUBZERO
- Marte Arturo Cázarez Duarte and Adrián López Velarde, Co-founders, Desserto
- Ryan Chetiyawardana, Founder, Mr Lyan Studio

A RESILIENT, CARBON NEUTRAL AND CIRCULAR FUTURE

10:00 Keynote: Are we on track to create a circular future?

- Dr. Janez Potočnik, Co-Chair of the International Resource Panel and Partner at SYSTEMIQ

10:30 Networking Break

10:45 Keynote Responding Panel

- Kai Chen, Professor, Institute for Resources, Environment and Sustainability, University of British Columbia
- Ashima Sukhdev, North American Programs Lead, Ellen McArthur Foundation
- Speaker to be confirmed

11:30 Canadian Milestones

Learn how the Quebec Circularity Gap Report is helping accelerate action in the Province of Quebec and how leaders in Canada are uniting on a new a vision of a circular economy for plastic, in which plastics stay in the economy and out of the environment.

- Sophie Langlois Blouin, Senior Vice President of Operations, RECYC-QUEBEC
- Speaker to be confirmed

CITIES AND REGIONS - BRIDGING SOCIAL, CLIMATE AND ECONOMIC GOALS

11:45 Planning for a better future: ideas and inspiration for a post-pandemic urban areas

The pandemic has changed our production and consumption patterns and impacted our urban fabric. From adaptive reuse, material cycling to ecological restoration and the future of work, explore the role of circular development strategies in creating resilient and prosperous urban systems.

- **Spark Talk:** Joanna Williams, Director of the Circular Cities Hub and Professor in Sustainable Urbanism at the Bartlett School of Planning, University College of London

12:05 The journey for a circular future – the urban perspective

- Panel to be confirmed

12:45 Networking Lunch

STEP INTO CREATIVE AND INNOVATIVE THINKING

1:30 Welcome back

- Jack Froese, Chair, National Zero Waste Council

1:30 Keynote: Innovation and Investment for System Design

- Arlene Dickenson, Dragon, Entrepreneur, Partner (invited)

2:00 Is the future of food and circular food systems found in design?

Driving down food waste can mean donating more, cooking with less, thriftier procurement. But what if driving down food waste is an even more intentional act of re-imagining? What if the future of food, and circular food systems, is found in design?

Design of food businesses, products, infrastructure, supply chain? Design of relationships and collaboration, of investment that supports innovation? Design of local and global systems – social and economic? A cultural and material design project that simultaneously transforms our economy, our neighborhoods, and our place-based identities?

Innovator Spotlight

- Adolefami Agunbiade, FoodNerve

Armchair Discussion:

- Lauren Abda, CEO of Branchfood Ventures
- Speakers to be confirmed

2:45 Innovation Showcase

- David Côté & Julie Poitras-Saulnier, Co-founders, LOOP Mission
- Garry Cooper, CEO, President & Co-founder, Rheaply
- Miranda Wang, CEO & Co-founder, Novoloop

3:15 Networking break

3:30 Keynote: Adapt and Thrive - Embracing humanity for transformation

- Sheila Watt-Cloutier, Environmental, Cultural, and Human Rights Advocate

Sheila reminds us of the human face of climate change and how indigenous worldviews opens an important perspective on how to move forward. Sheila calls on us to harness our imaginations and truly understand the opportunity of collective action to realize the future we all need.

4:00 Achieving Planetary Health Through Human Health

As industries seek ways to accelerate circularity, healthcare is not often top of mind. A year into a global pandemic the spotlight has been on this vital sector which also creates significant environmental impacts. The Planetary Healthcare Lab is helping researchers understand how we can implement circular solutions to advance environmental and human health gains. And how can the protection of human health result in a healthier planet? In this session, we'll hear about new research and promising opportunities to achieve circularity while protecting public health.

Armchair discussion:

- Dr. Andrea MacNeill, Planetary Healthcare Lab, UBC
- Speaker to be confirmed

4:30 Closing Keynote: Living in the intertidal zone

- Billy Almon, Astrobiofuturist

Biology-inspired solutions to improve the human condition for those of us on earth and those who will travel to the stars? A storyteller, Billy draws on his understanding of nature to illustrate the adaptive character of species and ecosystems and the ability to rebound from dramatic events and changes. Share Billy's passion, as we aspire to a future that regenerates systems, communities and people in a dynamic, ever changing environment.

5:00 Closing Remarks