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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Water Committee

From: Goran Oljaca, Director, Engineering and Construction, Water Services

Date: October 8, 2021 Meeting Date: November 4, 2021

Subject: **Water Services Asset Maintenance and Replacement Highlights**

RECOMMENDATION

That the Water Committee receive for information the report dated October 8, 2021 titled "Water Services Asset Maintenance and Replacement Highlights".

EXECUTIVE SUMMARY

Metro Vancouver Water Services has an ongoing asset management program to assess, repair, upgrade and improve the regional water transmission system, as required. A sizeable portion of Metro Vancouver's capital and operating programs focuses on asset maintenance and system upgrades.

Over the past several years, significant progress has been made with respect to this area of work and includes the replacement of aging water mains and water distribution equipment, system optimization and continued maintenance of infrastructure and equipment. The goal of this work is to identify and upgrade aged components within the water system that may pose a risk so that Metro Vancouver can continue to provide safe, clean drinking water to the region. Given the size and age of the Greater Vancouver Water District system, Metro Vancouver Water Services will have an increased focus on the asset management program in the coming years and decades.

PURPOSE

To provide the Water Committee with information on Water Services' continued efforts to upgrade and improve the water transmission system and eliminate the potential risks with legacy infrastructure.

BACKGROUND

The Infrastructure Maintenance and Infrastructure Upgrade programs within Water Services Long Range Plan represent approximately 25% of the overall capital budget. These areas of the plan focus on the assessment, repair, upgrades and improvements to the water transmission system.

These programs are important to ensure Metro Vancouver can reliably continue to provide safe, clean drinking water to the region. Over the past few years, significant progress has been made in the following areas:

1. Water Main Replacement
2. Water Transmission Equipment Replacement
3. System Optimization, and
4. Continued System Maintenance.

WATER MAIN REPLACEMENT

Greater Vancouver Water District (GVWD) has over 520 kilometers of large diameter water mains within the water distribution system with some of them in operation since the 1930's. Through inspection and assessments, staff identify water mains that are reaching the end of their useful lifespan and plans are made for replacement, where necessary. Over the past several years, Water Services staff have made significant progress related to the replacement of aging water mains, including the following:

South Delta Main No. 1 Replacement: This project includes the installation of approximately 5000 m of 900 mm diameter steel pipe to replace the aging South Delta Main No. 1 in the City of Delta. The construction of the new water main began in 2015 and the last phase was completed in July of 2020. The new water main is now in service. The project includes a new underground cross-over valve chamber that significantly enhances the flexibility and resiliency of the system supplying water to the residents of the City of Delta and the Tsawwassen First Nation.

Braid Street Main Replacement: This project includes the replacement of 2000 m of 600 mm diameter water main in the City of New Westminster, which was built in 1927. The construction of the new 600mm diameter ductile iron water main began in 2017 and was completed in July of 2020. The new water main is now in service with additional components planned for installation in spring of 2022.

WATER TRANSMISSION EQUIPMENT REPLACEMENT

The water transmission system includes large diameter valves and other equipment used to regulate flows and pressures within the system and to redirect flows when necessary during planned and unplanned outages. Some of this equipment is aging or no longer meets current operational requirements. Highlights of recent progress related to the replacement of this equipment includes:

First Narrows Tunnel Isolation Chamber Improvements: In 2017, a full condition assessment was undertaken to assess the 90-year-old First Narrows Tunnel north shaft chamber and isolating valves and identified that all the valves within the chamber as well as two upstream isolation valves required replacement. Between December 2020 and May 2021, all of the valves were replaced, which required four separate operational shut downs of the First Narrows Tunnel and significant coordination with the City of Vancouver, District of North Vancouver and the Squamish First Nation. The valve upgrade project replaced the original single valve isolations within the chamber, which offers improved reliability and operational flexibility, a design which meets current best practices for water distribution systems and aligns with the Board Strategic Goal of maintaining Metro Vancouver's world-class water system.

Cleveland Dam – Lower Outlet HBV Rehabilitation: The Cleveland Dam is equipped with two Howell-Bunger valves (HBV) in the lower outlets, which are used to release water from the Capilano Reservoir to manage lake levels and meeting operating requirements. The valves were original equipment installed within the Cleveland Dam at the time of construction in the 1950's. A condition assessment in 2016 noted advanced deterioration of the valves and replacement or rehabilitation of the valves was recommended. Over the past two years, plans have been underway to replace the 1.3 m diameter valves beginning with the purchase of two new fixed cone valves. Between April and May

of 2021, the two new valves were installed and are now in service. Additional enhancements to reduce discharge water turbulence within the lower outlets are planned over the next few months.

SYSTEM OPTIMIZATION

In order to monitor flow, pressure and water quality within the transmission system, GVWD owns and operates numerous flow meters, pressure gauges and residual chlorine analyzers. Due to the age of some of this equipment and expansion of the water supply network, Water Services staff have implemented replacement and optimization programs to replace and add monitoring equipment. Highlights of recent progress related to these programs include:

Water Meter Upgrade and Optimization Programs: The Water Meter Upgrade and Optimization Programs includes the installation of various instrumentation devices and meters to monitor flows and pressures within the water transmission system. When completed, these instruments will assist staff to monitor and optimize system performance, and eventually automate the network. System-wide, 143 locations for new meters and instrumentation have been identified under this program. The team has completed the installation and commissioning of the first 17 priority sites and are in the preliminary design of the next set of 24 new instruments.

Coquitlam Ozone Generators Replacement – Water from the Coquitlam Reservoir is pre-treated with ozone before it enters the Coquitlam UV Disinfection Plant. Ozone helps remove micro-organisms from the water, improves water quality and reduces disinfection by-products. Ozone also improves water clarity, which increases the efficiency of the subsequent ultraviolet disinfection process. The three Ozone Generator Reactors (OGRs) and their Power Supply Units (PSUs) were originally installed in 1999. The PSUs are currently being replaced and upon completion, will increase the ozone production capacity of the OGRs. The replacement is scheduled to be completed by late 2021.

Coquitlam pH/Alkalinity – As part of regional improvements, GVWD adjusted the pH of the water from the treatment plants to reduce corrosion levels throughout the region. In order to do this at the Coquitlam Water Treatment Plant, the existing CO_2 system was upgraded and commissioned earlier this year. This involved refurbishment of the CO_2 storage tank and installation of new injection equipment and piping, as well as system integration.

CONTINUED SYSTEM MAINTENANCE

System Maintenance is an important component of the Water Services Department's Long Range Plan and addresses the need for replacement or refurbishment of existing infrastructure to ensure that it continues to perform as required to meet service objectives. The following projects have recently achieved major project milestones in addressing this goal, including:

Little Mountain and Kersland Reservoir Upgrades – The maintenance for these reservoirs included roof repairs and concrete sealing as well as joint replacement. Both of these reservoirs are located in Queen Elizabeth Park and the work involved close collaboration with the Vancouver Parks Board. Little Mountain Reservoir was completed this summer and Kersland reservoir will be completed over

the coming winter. This work is required to ensure that water quality is maintained throughout the lifespan of the reservoirs.

Capilano Energy Recovery Facility Corrosion Mitigation – The coating on some of the piping, valves, and other various equipment inside the Capilano Energy Recovery Facility's Machine Hall room was recently replaced to mitigate surface corrosion. This work involved cleaning and removal of any existing corrosion, repassivation of stainless steel surfaces, and the application of a corrosion prevention coating.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Cashflows and household impacts related asset management and capital investment in Water Services is encompassed in annual budget approval processes.

CONCLUSION

Metro Vancouver has a long history of providing safe, clean drinking water to the region, including an ongoing maintenance and upgrade program to assess, repair, upgrade and improve the water distribution system, as required. The identified upgrade and replacement work is included in the Infrastructure Maintenance and Infrastructure Upgrade Programs within the Water Services Long Range Plan. The work completed within the past few years and underway is significant and these upgrades ensure aged components within the water system that may pose a risk are identified and replaced, maintained or upgraded as required. Given the size and age of the Greater Vancouver Water District system, Metro Vancouver Water Services will have an increased focus on the asset management program in the future.

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To: Water Committee

From: Lucas Pitts, Acting Director, Policy, Planning and Analysis, Water Services
Andrew de Boer, Acting Director, Operations and Maintenance, Water Services

Date: October 19, 2021 Meeting Date: November 4, 2021

Subject: **Summer 2021 Water Supply Performance**

RECOMMENDATION

That the Water Committee receive for information the report dated October 19, 2021, titled "Summer 2021 Water Supply Performance".

EXECUTIVE SUMMARY

The water supply system performed well during summer 2021 despite unprecedented hot weather conditions and higher than normal water consumption. Metro Vancouver must continue to focus on conservation initiatives as any sustained decrease in per capita consumption will have positive impacts on both system planning and operation. A sustained reduction in water use will also allow for the deferral of a number of growth-related projects as current assessments indicate that the new infrastructure will only be needed on the current timelines if summertime demand for drinking water continues to increase.

PURPOSE

To provide the Committee with a review of water use and water supply system performance during summer 2021.

BACKGROUND

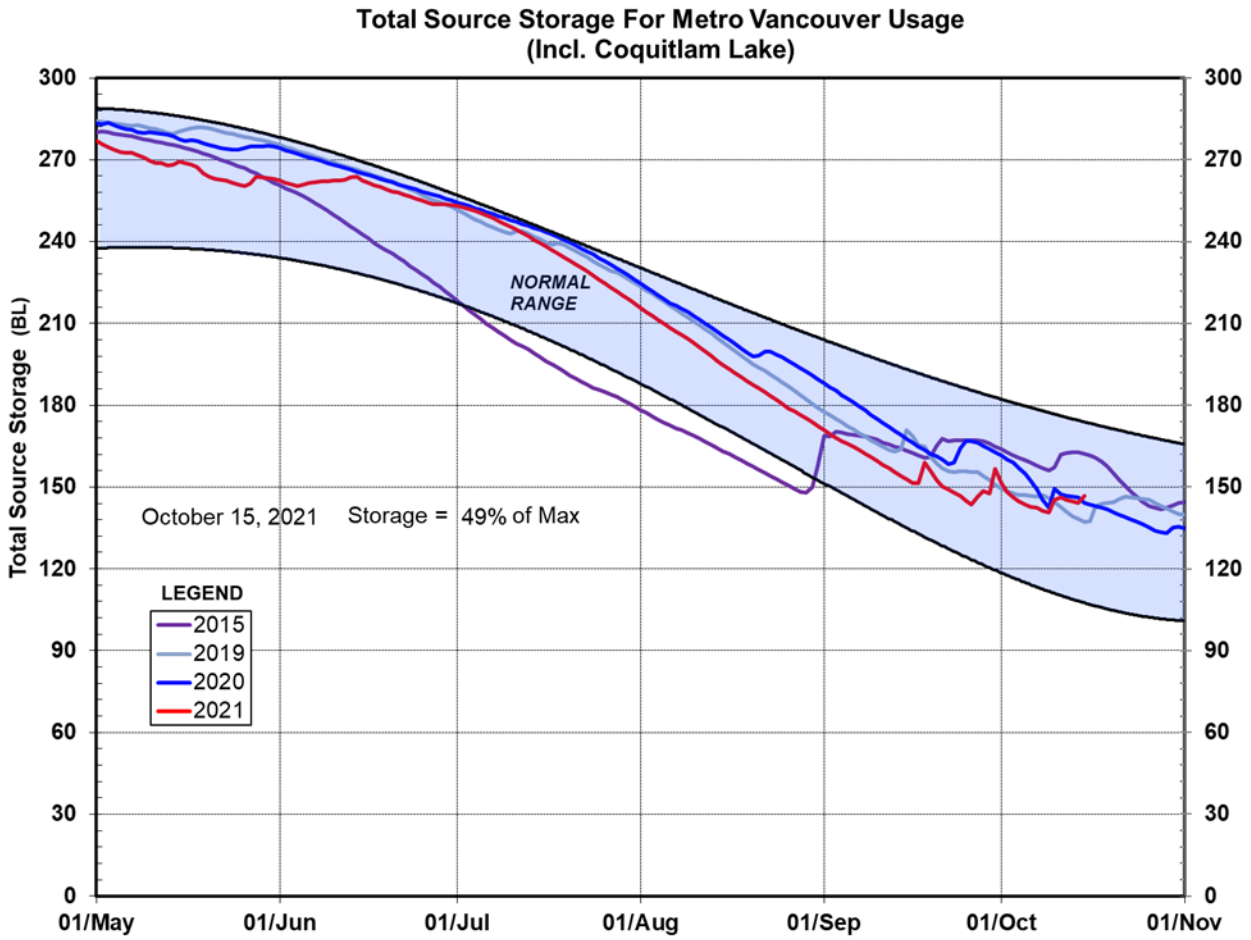
At the May 13, 2021 Water Committee and the May 29, 2021 GVWD Board meetings, the Committee and Board received a water supply forecast and water consumption update for the summer 2021. At the July 15, 2021 meeting, the Committee also received a water supply update in the Manager's Report, including the status of available storage in the GVWD source reservoirs.

As per the Committee's 2021 Work Plan, this report provides an overview of the performance of the regional water supply system during the summer of 2021.

2021 SUMMER WATER DEMANDS AND STORAGE LEVELS

The Metro Vancouver region experienced higher than average snow pack this past winter. Record high temperatures in the second half of June contributed to a faster than normal snow melt, resulting in reservoir drawdown starting in early July. The Total Source Storage in May was approximately 5% below typical, as Capilano Reservoir was being operated at a lower level as the spillway gate was undergoing necessary maintenance work prior to being raised in order to store water. The source reservoirs were proactively managed to capture the incoming streamflow to ensure Seymour and Capilano Reservoirs reached their respective full pool elevations before June 1, 2021 and July 1, 2021.

Figure 1 – Total Source Storage for Metro Vancouver Usage (Incl. Coquitlam Lake)

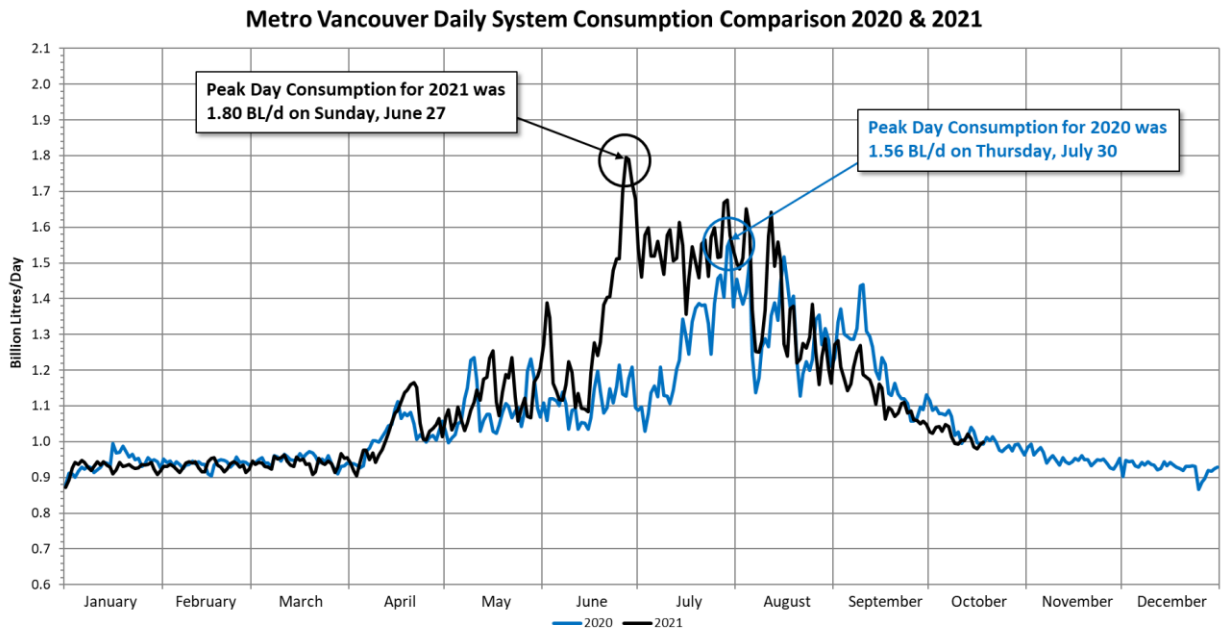


As shown on Figure 1, total source storage for Metro Vancouver usage began the summer in the normal range. Throughout summer and fall 2021, the total source storage levels were maintained within the normal range and Metro Vancouver remained in Stage 1 of the *Drinking Water Conservation Plan* (DWCP).

The heat wave in June and warm dry conditions during July resulted in higher than average water use across the region.

Overall system demands, river inflows and system storage were closely monitored and each of the three source reservoirs proactively managed to maintain a reliable water supply for the region.

Figure 2 – Metro Vancouver Daily System Consumption Comparison 2020 and 2021



As shown on Figure 2, the highest peak day consumption in summer 2021 of 1.80 billion litres/day was recorded on Sunday, June 27, 2021. An extreme heat wave affected the lower mainland from late June through mid-July and peaked on June 28 – 29, 2021. The above normal water use was sustained during this period. The 2021 peak day consumption was observed a few weeks earlier than what had been recorded in previous years. This compares to the highest peak day consumption in summer 2020 of 1.56 billion litres/day on Thursday, July 30, 2020. Sundays and Thursdays are both permissible days for lawn watering under Stage 1 of the DWCP, implemented every year on May 1st.

Benefits of Water Conservation Measures

The current Stage 1 of the DWCP provides the opportunity for residents to water lawns two mornings per week and limits watering of trees, shrubs and flowers, if using a sprinkler, to mornings only, but on any day of the week. Metro Vancouver's *Region-wide Guide for Enforcement of the Drinking Water Conservation Plan* provides best practices related to enforcement through various methods.

To further help reduce seasonal water demands, Metro Vancouver has proposed updates to the DWCP which will decrease the allowable residential and non-residential lawn watering days from two days per week to one day per week during Stage 1. These updates are expected to be implemented for summer 2022.

Record high temperatures in late June resulted in higher than average water consumption that continued into July even when temperatures moderated. Metro Vancouver's key initiatives in 2021 included communication of the region-wide watering regulations and a regional communications

campaign - *We Love Water* - to increase awareness of Metro Vancouver's water system and the need for residential water conservation.

Figure 3 – Comparison of 2021 and 2020 Hourly Water Use

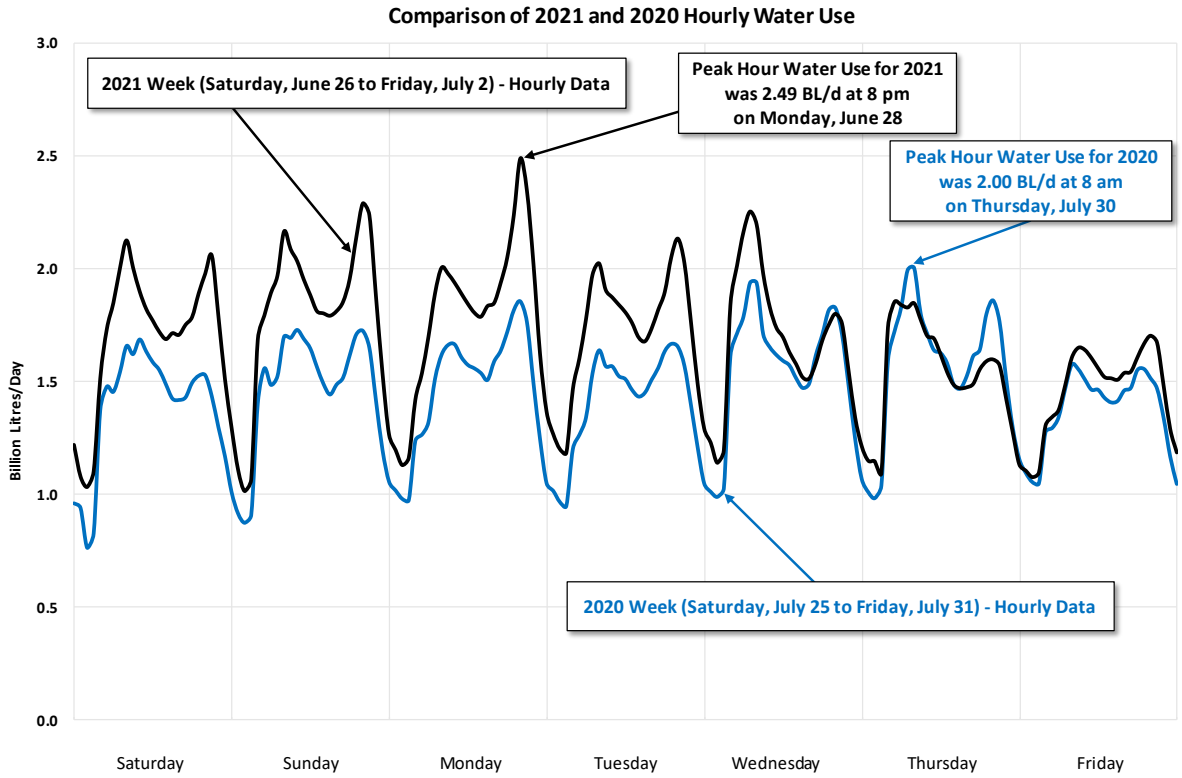


Figure 3 compares hourly water use during the week when peak day occurred in summer 2020 (Saturday, July 25 to Friday, July 31), to the week when peak day occurred in summer 2021 (Saturday, June 26 to Friday, July 2). Summer hourly water use patterns in 2020 and 2021 overall are similar and reflect higher morning peaks on Wednesdays and Thursdays, when lawn watering is permitted.

During the heat dome period (June 27 – 29, 2021), the peak hour occurred at 8 pm on Monday, a non-sprinkling day.

Water conservation campaigns implemented by Metro Vancouver and member jurisdictions continue to help reduce peak water use. Peak period water use is very dependent on summer weather conditions, being higher in years with periods of relatively hot, dry weather such as 2018, and 2021 and lower in years with more average temperatures and precipitation such as 2019 and 2020.

During the high summer demands this year the water supply system performed very well without significant stresses.

ALTERNATIVES

This is an information report; no alternatives are presented.

FINANCIAL IMPLICATIONS

Revenues from water sales to the end of September are 1.7% above budget.

CONCLUSION

Total source storage for Metro Vancouver water usage began the summer in the normal range. As the summer progressed, reservoir inflows and source storage declined; however, the total water storage volume remained within the normal range. Water use in June and early July 2021 was above normal due to hot weather and dry conditions. Peak water use occurred in late June and was higher than levels seen in 2020.

Summer 2021 was the fourth summer the *Drinking Water Conservation Plan* (DWCP) restrictions were implemented, along with the Board endorsed best practices for local governments relating to DWCP education, compliance monitoring and enforcement. Similar to 2019 and 2020, water use on Mondays and Tuesdays was reduced, as lawn watering by residential users is no longer permitted on these days. These reductions were partially offset by higher usage on Thursdays. The timing of the peak water usage also shifted to later in the morning possibly due to more residents continuing to work from home as a result of COVID-19 restrictions. Implementation of the DWCP restrictions along with water conservation campaigns by Metro Vancouver and member jurisdictions are helping to reduce water use.

The water supply system performed without any significant stresses over the 2021 summer season. Water conservation will continue to be an important factor in determining future system needs. Sustained reductions in per capita water use over the coming years could potentially defer the large capital investments required to meet the needs of a growing region.

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To: Water Committee

From: Larina Lopez, Corporate Communications Division Manager, External Relations
Amy Weiss, Project Communications Coordinator, External Relations

Date: October 22, 2021 Meeting Date: November 4, 2021

Subject: **Regional Water Conservation Campaign and Water Regulations Communications 2021 Results**

RECOMMENDATION

That the Water Committee receive for information the report dated October 22, 2021, titled "Regional Water Conservation Campaign and Water Regulations Communications 2021 Results".

EXECUTIVE SUMMARY

Metro Vancouver undertakes several communications initiatives annually to ensure water resources are used efficiently throughout the region. Key initiatives in 2021 included communication of the region-wide watering regulations and a regional communications campaign – *We Love Water* – to increase awareness of Metro Vancouver's water system and the need for residential water conservation. The promotional strategy for both initiatives included broad reach through television, radio, print, and outdoor advertising, as well as targeted and weather-triggered digital tactics. In total, broadcast and digital promotions delivered over 36.6 million impressions with 35% more web visits than 2020 including 9,479 visits to the Lawn Watering Regulation web page, and over 599,000 social media views. Despite the campaign's reach, water use was at a record high in 2021 during the ongoing hot and dry weather. In 2022 Metro Vancouver will re-examine water conservation communications to reflect the proposed changes to the Drinking Water Conservation Plan (DWCP). We will also communicate that regional decreases in per capita water use have plateaued and that sustained reductions in water demand through good water conservation habits throughout the region could help defer the need for additional water supply projects targeted to meet increased demand related to population growth.

PURPOSE

To update the Committee on regional communications to support the 2021 watering regulations and regional water conservation campaign.

BACKGROUND

Metro Vancouver undertakes several communications initiatives annually to help the public become aware of their role in ensuring water resources are conserved and efficiently used throughout the region. Communication of the region-wide watering regulations supports the DWCP, which helps manage the use of drinking water during periods of high demand and largely impacts the watering of lawns and landscapes. A regional communications campaign – *We Love Water* – increases awareness of Metro Vancouver's water sources, system, and the need for residential water conservation, while providing residents with advice and tips for using less water around their homes.

The *We Love Water* conservation campaign started in 2016, and has been adjusted yearly to reflect ongoing research and evaluation. This year, the campaign focused on source awareness and outdoor conservation opportunities, which aligned with communication of the regional watering regulations and the resources available on the Grow Green website.

WATER CONSERVATION COMMUNICATIONS

Communications Approach and Timing

Metro Vancouver's water conservation communication works to expand public awareness of our water sources, the quality of Metro Vancouver's drinking water, and the importance of not wasting it. Promotion of the regional watering regulations and the *We Love Water* conservation campaign incorporate consistent branding, imagery, and messaging.

Metro Vancouver promoted the regional watering regulations in advance of the May 1 implementation date and continued until the regulations' October 15 end date. Metro Vancouver collaborated with members to determine the most effective messaging and methods for consistently communicating the regulations in 2021.

Metro Vancouver promoted the regional *We Love Water* conservation campaign from May 17 to September 5, 2021. Promotions were primarily directed towards single-family dwelling residents, because they are most likely to engage in the outdoor water uses that contribute to higher seasonal water demand. The campaign emphasized water source and system awareness through existing content and new content incorporating broader outdoor water conservation and education messaging during the drier summer months. By first educating residents about where their drinking water comes from, the people involved, and the amount of work it takes to reach their taps, the campaign was better equipped to encourage residents to reduce their outdoor water use.

Promotional Strategy

Metro Vancouver generated awareness about the watering regulations, the regional water sources and system, and the importance of outdoor conservation through the following activities:

- Television commercials, conservation messaging, and sponsored weather updates on Global BC, as well as campaign content on the station's webpage and social media channels;
- Radio commercials and sponsored weather updates;
- Weather-triggered and static digital billboards on major traffic routes throughout Metro Vancouver;
- Targeted social media advertising;
- Organic social media including a new tactic using Instagram Stories, which featured a member of the Watershed Operations team promoting water source and conservation education through a watershed walking tour, a water source quiz, and a conservation quiz to test viewer's knowledge;
- YouTube video advertising, weather forecast-activated online banner advertising, and search engine advertising targeting users' interests (e.g., gardening, lawns, car washing) to encourage conservation;
- A media release prior to the May 1 activation date which received significant coverage; and

- A direct mail postcard on the regulations and water conservation, sent to all single-family and multi-family homes with lawns across the region.

Examples of communication materials and promotions to support the watering regulations and the *We Love Water* conservation campaign are included in the Attachment.

Metro Vancouver Member Engagement
Metro Vancouver made communication materials available to all GVWD members for display and distribution through localized opportunities. Items included social media content and co-branded and translated assets like posters, rack cards, and newspapers advertising templates, as well as digital billboards and transit shelter advertising. Members used these materials consistently and widely, and broad participation amplified public awareness of both the watering regulations and the conservation campaign.

Evaluation
The campaign was evaluated through various indicators and tracking methods described below.

Website Traffic

- The welovewater.ca website received 60,421 page views during the 3.5-month duration of the 2021 conservation campaign. This is over 35% higher than 2020 levels, and is attributed to better refined tactics and an unusually hot, dry summer.
- Metro Vancouver's lawn watering regulations webpage received an additional 9,479 page views during implementation of the regulations, from May 1 to October 15, 2021.

Television and Radio

- Global BC television and online channels featured the campaign in 811 spots, which were viewed 7.7 million times.
- PSAs ran on 14 additional television networks, targeted to the Metro Vancouver region. These spots aired a minimum of 1,456 times.
- The campaign spots featured on four radio stations, and were heard 8.8 million times.

Digital Media

- YouTube advertising was seen over 3 million times. Over fifty percent of the ads that could be skipped were viewed to completion, exceeding industry benchmarks.
- Social media (Facebook, Instagram, and Twitter) posts were viewed 3.8 million times, by over 599,000 Metro Vancouver residents.
- Online banner ads were viewed 1.4 million times, with weather-triggered advertising reaching residents when water conservation was most relevant.

Print

- A direct mail postcard detailing the watering regulations and other outdoor conservation opportunities was delivered to 534,000 single-family homes throughout the region.

Out-of-Home

- Water conservation messaging featured on 10 digital billboards located on major traffic routes throughout Metro Vancouver.
- The billboard ads were seen 11.7 million times.

Survey

- A short survey focused on public perception of brown lawns and lawn watering behaviours was conducted late October; results will be available in mid-November.

Plans for Fall 2021 and 2022 Regional Communications*

**Pending approval of changes to the DWCP. The campaign described below would be adjusted to reflect the decision made at the October 29th Board meeting.*

A small promotion campaign is planned for fall 2021, focused on helping residents create smart water habits year round that may help defer costly infrastructure upgrades and support the efficient use of drinking water. This campaign will also introduce the proposed DWCP changes if they are approved. Introducing these changes, including lawn watering being reduced to one day per week, while the dry hot summer is still fresh in their minds and in advance of the spring 2022 lawn watering regulations may help public sentiment and reception of the changes.

Communication of the 2022 watering regulations and the *We Love Water* conservation campaign will continue to use creative assets developed in previous years, with updates to language around permitted watering times if the DWCP changes are approved. Campaign communications will focus heavily on lawn watering and outdoor water conservation, as well as water source awareness and appreciation. Educating on the need for and the benefits of water conservation has always been the overarching objective of *We Love Water* campaign communications. In 2022, this will continue to be strengthened with the objective to build and instill an even stronger culture of water conservation throughout the region, thereby achieving sustained reductions in summer water demand and deferring the need for additional water supply projects.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The 2021 budget for watering regulations communications and the regional water conservation campaign was $270,000. These costs were included in the 2021 Water Services Communications Program Budget managed by the External Relations Department.

CONCLUSION

Metro Vancouver communicated the watering regulations prior to the May 1 activation date via advertising across the region and media engagement, and through a range of items distributed to GVWD members for public education and enforcement. In its sixth year, the regional water conservation campaign entered market in mid-May, with an emphasis on water source and system education, before incorporating conservation messaging in the warmer and drier summer months.

Campaign advertising appeared in a variety of news media, on digital billboards throughout the region, via social media and digital platforms, and through opportunities secured by GVWD members.

Beginning in fall 2021 and 2022, Metro Vancouver will focus the *We Love Water* campaign more heavily on lawn watering regulations communications and educating residents on the impact water conservation has on deferring costly infrastructure to help instill an even stronger regional culture of water conservation and the opportunity to achieve sustained reductions in water usage.

Attachment
2021 Water Conservation Communications Materials

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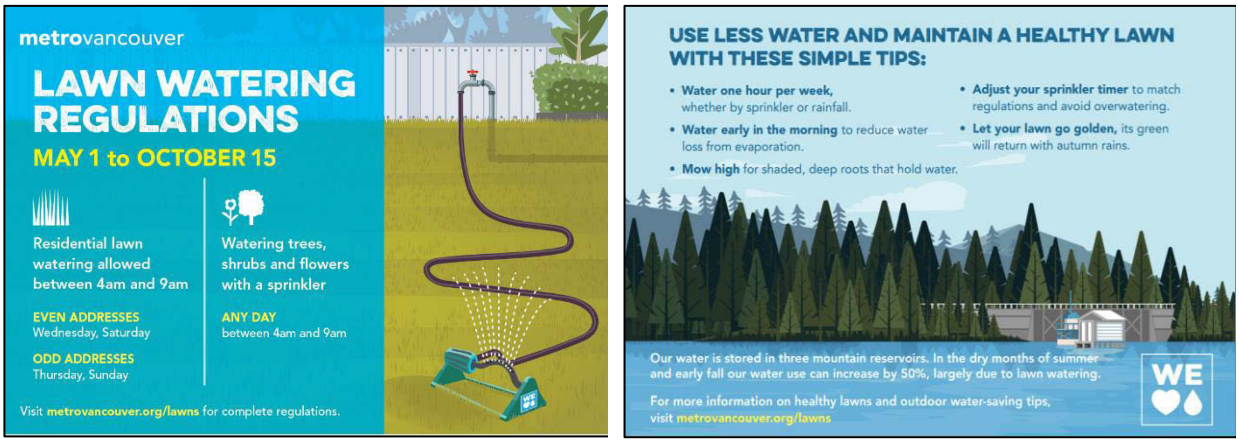
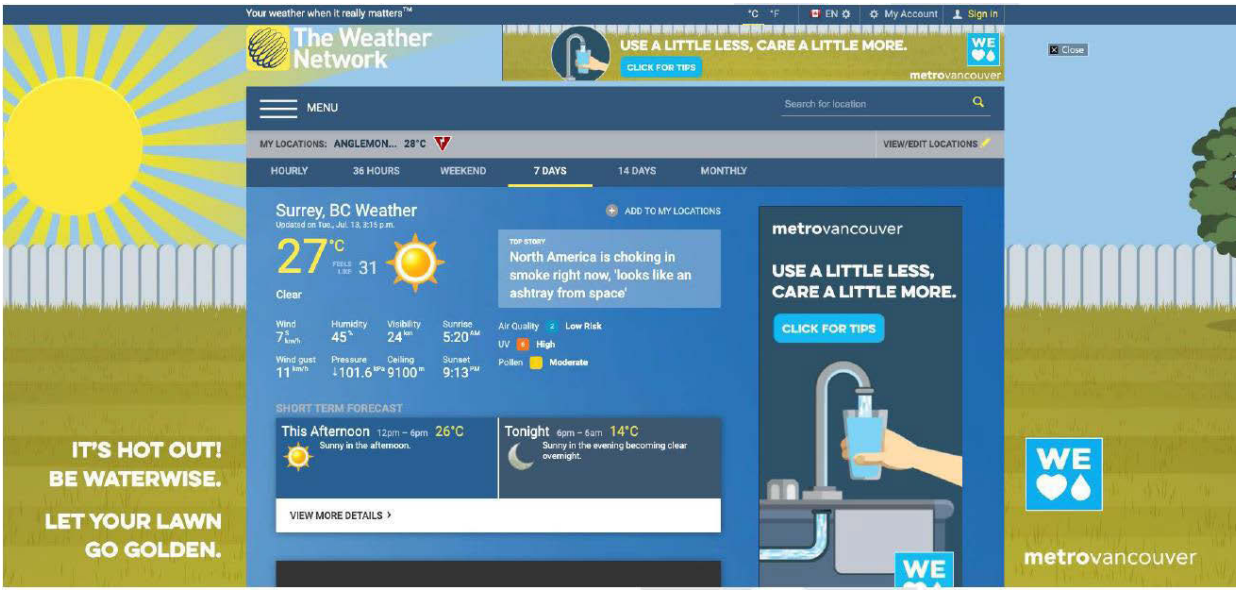
2021 Water Conservation Communication Material

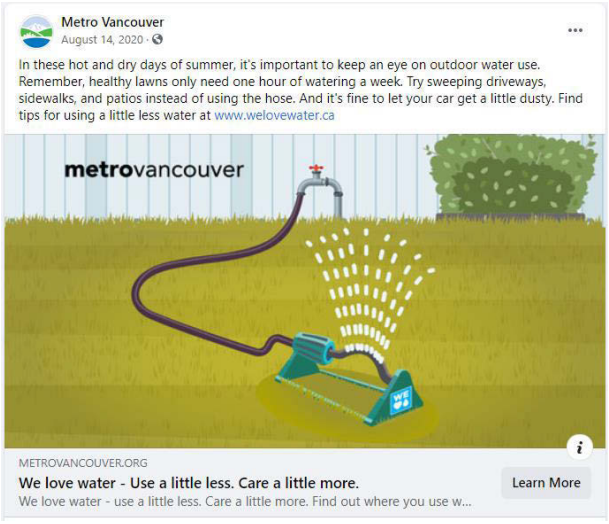


Flyer mailed to 534,000 single-family homes, providing information about the watering regulations and maintaining a healthy lawn with less water.

Example of digital ads featured on Global television.



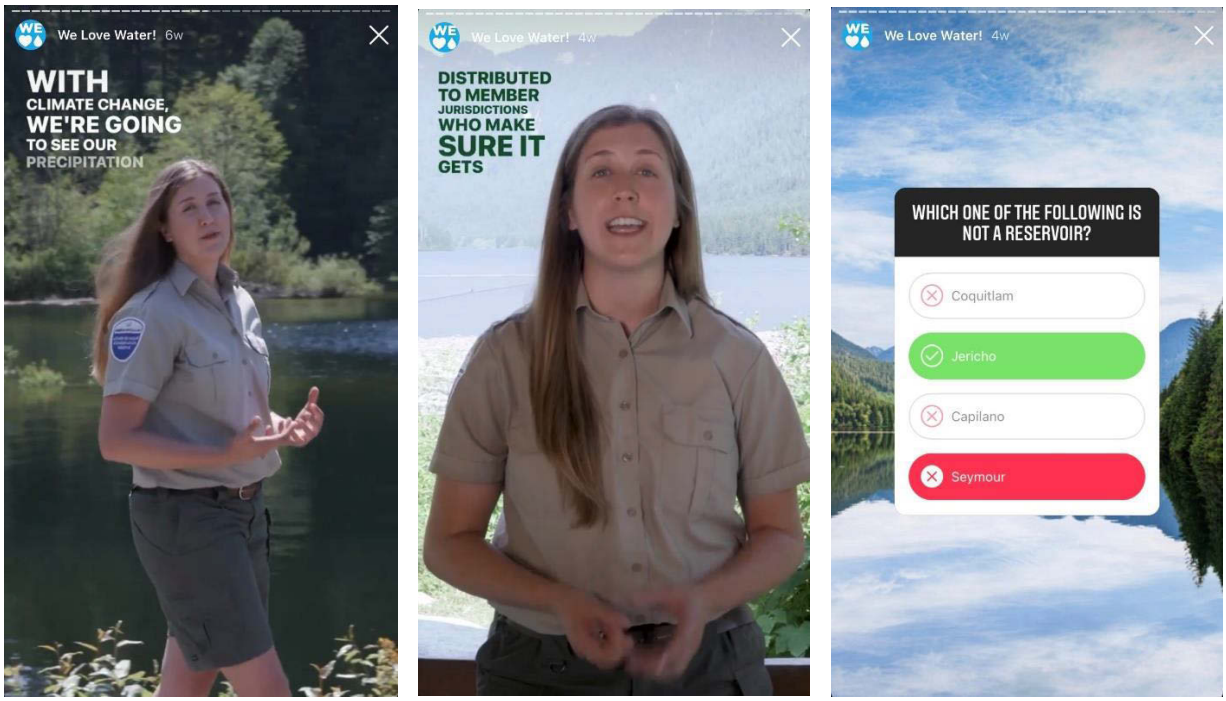
Example of Weather Network online banner takeover.



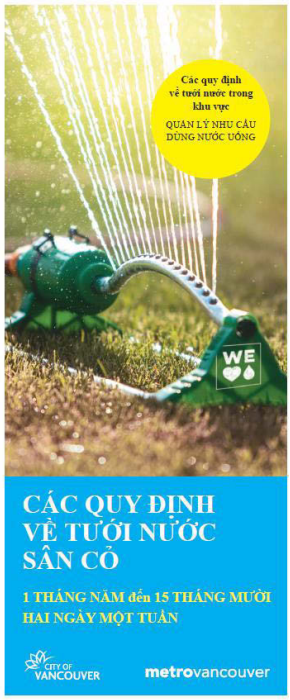
Social media post encouraging conservation.

Digital billboard at Alex Fraser Bridge, one of seven on major traffic routes throughout region.

Digital banner ad promoting water source awareness.



Still-shots from the new Instagram Story videos featuring Dayna Timmons from the Watershed Operations team and one of eleven quiz questions.



Translated and co-branded brochures and collateral available to members upon request.

Co-branded digital billboard in partnership with the City of New Westminster.

To: Water Committee

From: Jesse Montgomery, Division Manager, Environment, Water Services

Date: October 22, 2021 Meeting Date: November 4, 2021

Subject: **Watershed Fisheries Initiatives Annual Update**

RECOMMENDATION

That the Water Committee receive for information the report dated October 22, 2021, titled "Watershed Fisheries Initiatives Annual Update".

EXECUTIVE SUMMARY

As a component of organizational contributions, GVWD manages and participates in fisheries initiatives both upstream and downstream of the dams that define the three water supply areas in the Capilano, Seymour and Coquitlam River Watersheds. Liquid Waste Services, Regional Parks, Water Services and other Metro Vancouver departments collectively contribute to Pacific salmon conservation and restoration. GVWD strives to ensure fisheries protection and enhancement initiatives are evaluated, planned and implemented in a manner which consistently meets the Capilano Seymour Joint Water Use Plan and the Board Strategic Plan goal to *Work with First Nations and fisheries agencies in supporting the restoration of fish populations in the watersheds while maintaining the delivery of clean, safe drinking water*.

PURPOSE

To provide the Committee with an annual update on fisheries initiatives and activities associated with the Capilano, Seymour and Coquitlam Watersheds.

BACKGROUND

To facilitate Metro Vancouver's mandate of providing high quality drinking water as well as to actively support local fisheries initiatives, Metro Vancouver collaborates with Fisheries and Oceans Canada (DFO), the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD), BC Hydro, First Nations and stewardship groups. The initiatives described in this report are based on years of collaboration and rigorous scientific assessment. Climate change considerations such as shifting water temperature and river flow regimes are integrated into project planning.

As fisheries management and instream project works are winding down for the 2021 season, this report provides the Committee with an update on activities as identified in the Committee's 2021 Work Plan.

WATERSHED FISHERIES INITIATIVES

Capilano Watershed

The Capilano River Hatchery is located downstream of Cleveland Dam and is operated by DFO. The Capilano River Hatchery is currently in the design phase of a comprehensive redevelopment of the 50-year-old facility; staff are working with DFO to support this project, primarily in water supply

configurations from GVWD infrastructure. The hatchery annually transports a maximum of 7,500 adult coho salmon and all surplus steelhead trout (averaging 30 adults) upstream of the Capilano Reservoir to spawn. Staff worked with DFO this past summer to upgrade adult fish release infrastructure upstream of the dam.

Metro Vancouver staff have been actively capturing out-migrating juvenile salmon and trout (smolts) since 2008 in an effort to improve fish survival rates past Cleveland Dam. Staff successfully captured and transported 43,297 Coho and 461 Steelhead smolts from upstream of the dam to the Capilano River Estuary (Image 1). The total catch is the second most on record and was made possible by dam operational strategies in which spillway discharge was minimized during the peak out-migration.

Staff worked on fish passage improvements through upper watershed drainage structures (bridges and culverts) to improve fish habitat connectivity from the mainstem of the Capilano River to its productive tributary streams. At Enchantment Creek, a rock ramp was installed on the downstream side of the bridge crossing to help improve fish passage during low flow periods (Image 2). Metal baffles were also installed to help concentrate flows passing under the bridge towards the newly constructed rock ramp.

As follow-up to a fish stranding study in the Capilano River downstream of Cleveland Dam, completed under The *Water Sustainability Act* order for the Capilano Seymour Joint Water Use Plan (JWUP), staff continue to work on opportunities to minimize impacts to fisheries. An effectiveness assessment of the Capilano Fish Trap and Truck Program is nearing completion (year-end) and is the last of three pre-hydropower development ordered monitoring studies required under the JWUP order.

Seymour Watershed

The Seymour Salmonid Society operates the Seymour River Hatchery immediately downstream of Seymour Falls Dam. Hatchery operations are funded by DFO, Metro Vancouver and community sponsors. In September 2020, the GVWD Board approved renewal of the Contribution Agreement with the Seymour Salmonid Society, which provides $125,000 in annual core funding through December 31, 2023.

The Seymour Salmonid Society has also led ongoing efforts to restore fish passage past the rockslide that blocked the river channel 13 kilometres downstream of the Seymour Falls Dam in December 2014. Rock-breaking operations have been continually undertaken and this fall has seen the largest return of Coho salmon upstream past the rockslide since it initially blocked fish passage. These returning adult Coho will either naturally spawn in the river downstream of the dam; be captured and transported to the hatchery for processing or be captured and transported to the Seymour River upstream of the dam for natural spawning. In addition, 40,000 Coho fry raised at the hatchery were again transported upstream of Seymour Falls Dam this spring. 2021 also saw a strong return of adult Pink salmon to the Seymour River downstream of the rockslide, some of which were collected to be utilized for hatchery propagation.

The *Water Sustainability Act* order for the Capilano Seymour Joint Water Use Plan required a Fish Stranding Study be completed in the Seymour River downstream of Seymour Falls Dam. This study is currently underway (extended from 2020) and may identify some opportunities for improvement in

dam operations to minimize impacts to downstream fish populations. A final report is expected by year-end.

Coquitlam Watershed

Metro Vancouver staff continue to participate in the Kwikwetlem Sockeye Restoration Program (KSRP), in collaboration with BC Hydro, Kwikwetlem First Nation, local and senior government agencies, as well as community stewardship groups. Staff continue their work with the KSRP partnership to support the construction of BC Hydro's Coquitlam Sockeye Hatchery near their dam facility. This support is currently proposed to include a critical primary water supply from adjacent GVWD infrastructure. The facility is anticipated to form a key aspect building toward restoration of a Sockeye population, a critical cultural restoration goal of the Kwikwetlem First Nation.

As follow-up to last year's transport of adult Coho salmon upstream of Coquitlam Dam, there are plans again this fall to transport up to 100 Coho adults for natural spawning in Coquitlam Lake tributaries. Coho salmon returns have been encouraging this year in the Capilano, Seymour and Coquitlam rivers.

ALTERNATIVES

This is an information report; no alternatives are presented.

FINANCIAL IMPLICATIONS

The initiatives described in this report have been funded from the Watershed and Environment Program budget as well as through partnerships with other organizations.

CONCLUSION

Metro Vancouver continues to proactively participate in a variety of meaningful fisheries initiatives both upstream and downstream of the dams that define the three water supply areas in the Capilano, Seymour and Coquitlam River Watersheds. A key Metro Vancouver objective is to ensure fisheries protection and enhancement initiatives are evaluated, planned and implemented in a manner which consistently meets the District's mandate of providing high quality drinking water supplies.

Attachment

2021 fisheries field work photos

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Image 1: Releasing Coho and Steelhead smolts at Burrard Inlet (GVWD First Narrows North Shaft site).

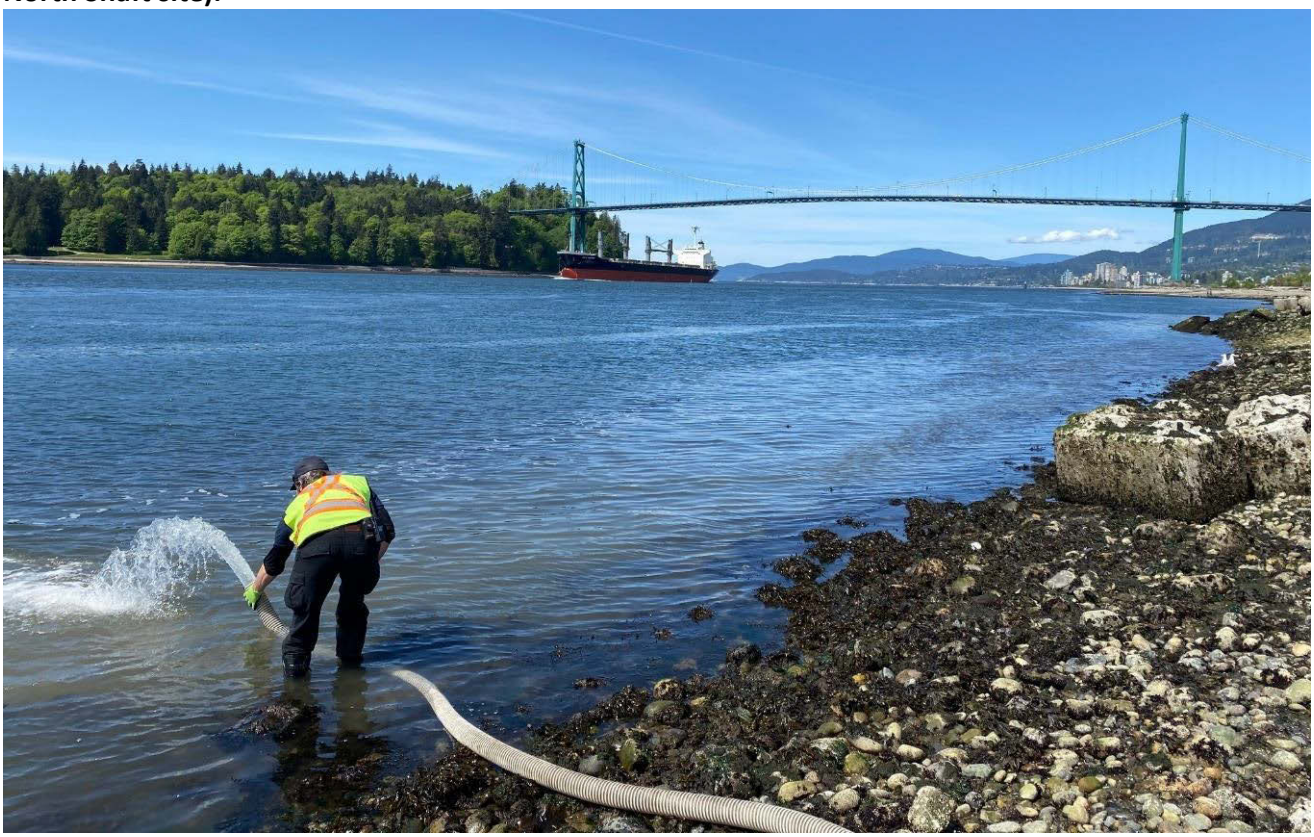

Image 2: Fish passage improvements at the Enchantment Creek bridge crossing in the upper Capilano Watershed.