APPENDIX B

DEMAND MANAGEMENT OUTREACH & EDUCATION

September 2024

SECTION 1. RESIDENTIAL WATER CONSERVATION

Background

From 1992 to 2016 the *Water Conservation Bylaw* watering restrictions were heavily enforced by Capital Regional District (CRD) Residential Water Conservation staff. These efforts included an outreach team of four staff physically checking homes in the summer to ensure compliance. A significant number of ads and staff resources were dedicated to ensuring that residents were aware of the bylaw. The CRD participated in events throughout the region to ensure that the residents were aware and compliance was met. In 2016, the *Water Conservation Bylaw* was amended to be less prescriptive and pivoted away from enforcement to an educational approach. In 2020, due to the pandemic, in-person outreach was not possible, and outreach was moved online, to video and social media content and digital and print advertising.

In recent years, the CRD Residential Water Conservation outreach campaigns have centered on informing residents on ways they can use water wisely. This includes educating and building awareness about where our water comes from, that it is finite and valuable, and different ways residents can conserve. The CRD residential water conservation messaging runs year-round, with messaging divided into seasons: in the colder months, Waterwise Indoors and Fix a Leak Week; and in the warmer months, Waterwise Summer and Waterwise Outdoors.

Water Wise Indoors

In the winter, the Waterwise Indoors program promotes waterwise tips for different areas inside the home, including the bathroom, kitchen and laundry room. The main themes of this campaign include encouraging residents to turn off the tap while brushing their teeth, strive for five-minute showers, implement water-efficient appliances, and detect leaks in their homes. This campaign includes a digital and print ad campaign, directing residents to the website where they can find more information. Social media posts generate engagement with contests and quizzes. Information sheets are available on the website, as well as at temporary displays set up at recreation centres throughout the region.

Fix A Leak

Each March, the CRD participates in Fix A Leak Week, an annual campaign that educates homeowners about leak detection best practices to reduce the amount of potable water loss in the region. Industry research says that approximately 14% of residential water use is attributed to leaks. To help residents proactively look for leaks in their homes, the CRD distributes Fix a Leak Week kits throughout the region for residents to pick up. These kits include toilet dye tabs, a bag to measure the flow rate of the showerhead, a new aerator for their faucet, and educational printed material. Print and digital ads and social media campaign raise awareness about where these kits are located and the benefits of looking for leaks.

Water Wise Summer

The Waterwise Summer campaign specifically promotes messaging about the *Water Conservation Bylaw* and promotes the activation of Water Use Restriction Stages. From May 1 to September 30 each year, Stage 1 Water Use Restrictions are in effect. Ad and social media campaigns communicate this information throughout the region.

Water Wise Outdoors

Residential water use almost doubles in the region in the summertime, primarily due to outdoor discretionary water use. The Waterwise Outdoors campaign provides information and tips to residents about how they can reduce their outdoor discretionary water use. This includes information about water wise lawn care and garden practices, efficient irrigation systems, collecting rainwater and planting native plants.

Digital and print ads, and social media posts help to share these messages throughout the region and direct residents to the website. Educational videos for water wise lawn care, native plants and irrigation best practices are available on the CRD website for residents to reference. The CRD offers annual workshops and webinars by trained experts about gardening with drought-tolerant native plants, creating climate-resilient gardens that better retain water and collecting rainwater for use in drier times. During the summer, the CRD's team of outreach summer staff attend community events to talk to residents about water conservation, and throughout the year there are outreach displays set up at places like community centres and garden centres, for people to learn about water conservation in their communities.

Water Stations

The CRD has five Water Stations that event organizers throughout the region can use during the summer months. These Water Stations provide clean drinking water to event goers who can use them to refill their water bottles. In the summer of 2023, the Water Stations were at 15 different events. When possible, the CRD Water Stations are accompanied by water conservation outreach materials to further enhance their impact to the community.

Current Initiatives

In addition to the above campaigns, in 2024 the Residential Water Conservation program has two new focuses. Reducing early morning water demand is a primary focus for the summer months, while engaging with Multi-Use Residential Buildings will take place in the fall and winter.

Reducing Early Morning Water Demand

A recent change was made to the *Water Conservation Bylaw* to reduce early summer morning water demand to protect the drinking water infrastructure and drinking water quality. A new lawn watering allowable time for timed/automatic irrigation systems was added to the bylaw. Promoting this new time to property owners, and landscape and irrigation professionals, asking them to modify the start times for irrigation systems to the overnight watering time and to ensure that systems do not start at the top of the hour, is a key part of this campaign.

Multi-Use Residential Buildings

After single family residential (49% of total retail use), condominiums and multi-use residential buildings (MURBs) together use 23% of the total retail use. A survey commissioned by CRD Environmental Resource Management in 2020 found that this sector is harder to reach due to the structure of utility billing. Typically, residents living in MURBs do not pay their water bills individually, so the incentive for residents to reduce water consumption to save financially is not an effective tactic. Using retail water demand data, water conservation staff can identify MURBs that are high water users and target them with specific messaging. Applying indoor and outdoor conservation key messages, both residential and Institutional, Commercial, and Industrial (ICI) water conservation staff will work with strata organizations and property management companies to help bring awareness to water conservation in MURBs.

Residential End Uses of Water Study

Alliance for Water Efficiency (AWE) and the Water Research Foundation (WRF) plan to update the Residential End Uses of Water Study in 2024-2025, which is an industry standard report utilized by many North American utilities. Flume Data Labs and Water DM were awarded the contract to deliver this study and the CRD was chosen as a partner in this project. The Residential End Uses of Water Version 3 study aims to increase understanding of single-family household end use and creates a baseline for multi-family household end use of water. The study will attempt to evaluate similarities and differences between single-family and multi-family households and between types of multi-family households.

All residential water end use estimates for the CRD's residential water conservation, ICI water conservation and demand management programs are informed by the 2016 Residential End Use Study Version 2, completed by AWE and WRF in 2016. This study provides residential end use data and statistics for fixtures and appliances in the home, including showers, taps and water-using appliances. Data from these studies is important for informing water conservation outreach initiatives and the demand management decision-making and forecasting processes for drinking water supply in the region. By participating in this study and providing CRD billing data for research analysis, the research findings can be used to update and inform demand management programs with a greater level of confidence.

Potential Future Initiatives

There has been a 10% increase in summer water demand and a 3% increase in winter water demand since 2019. With future programs and campaigns, the CRD will need to emphasize and enhance both indoor and outdoor water conservation messaging with additional programming. Currently, water conservation staff rely on purchasing ads, posting on social media, attending events, and distributing informational material to convey messages. Additional methods, such as conducting site visits, creating incentive programs, and completing residential surveys will be evaluated as future projects to increase residential awareness, create tools for residents to reduce their water demand, and gain valuable feedback about these programs.

1) Healthy Landscapes

Developing a residential healthy landscape assessments program would enhance education and outreach focused on decreasing outdoor water use, such as lawn watering and installing drought-tolerant landscaping, more efficient irrigation, and reducing water lost through leaks. This program would help residents, through on-site visits, workshops and webinars, to practice waterwise habits on their properties, such as converting traditional lawns and non-native gardens to native plant gardens. The City of Guelph created its own Healthy Landscape program, and its data demonstrated a 6.9% reduction in residential water use from site visits conducted by City of Guelph staff.

2) Incentive Programs

Water conservation tools, such as rain collection systems, micro/drip irrigation systems, soil moisture sensors and water flow monitors, can help residents reduce their water use. Incentive programs for water saving technology can reduce the financial barrier for residents to implement this technology in their homes and businesses.

Smart water flow monitors, for example, could help to reduce water loss by household and business water leaks. Water flow monitors provide real-time end use data to the user to show where and how much water is being used in a home or business. An incentive program would reduce the upfront cost of a flow monitor and give residents the tools to better understand their water consumption. These devices can provide data to the CRD and the resident about how much water is used for different activities. They can also detect leaks quickly, preventing the loss of clean drinking water in the home.

Smart water flow monitors can also provide valuable water end use data to research initiatives, such as the Residential End Uses of Water Study. Without a water flow monitor program, the CRD is only able to offer billing data to this study, which only gives a broad idea of the water use within the region. In the future, the ability to provide water flow monitor data on a region-wide scale to a research initiative such as this could allow the CRD to access residential end use data and statistics for fixtures and appliances in the home particular to our region. This data could be integral to understanding how water is used within our region and where opportunities for reductions are.

3) Market Analysis

Program evaluation surveys, previously done each year, could help staff assess the program's success and the reach that the program has within the community. They could also inform residential water conservation outreach campaigns going forward. Currently, the CRD’s measures of success are click-through rates on the website, engagement at events, webinars, and residential water demand. Although useful indicators of success, broader and more detailed responses would provide greater clarity and direction for water conservation programming.

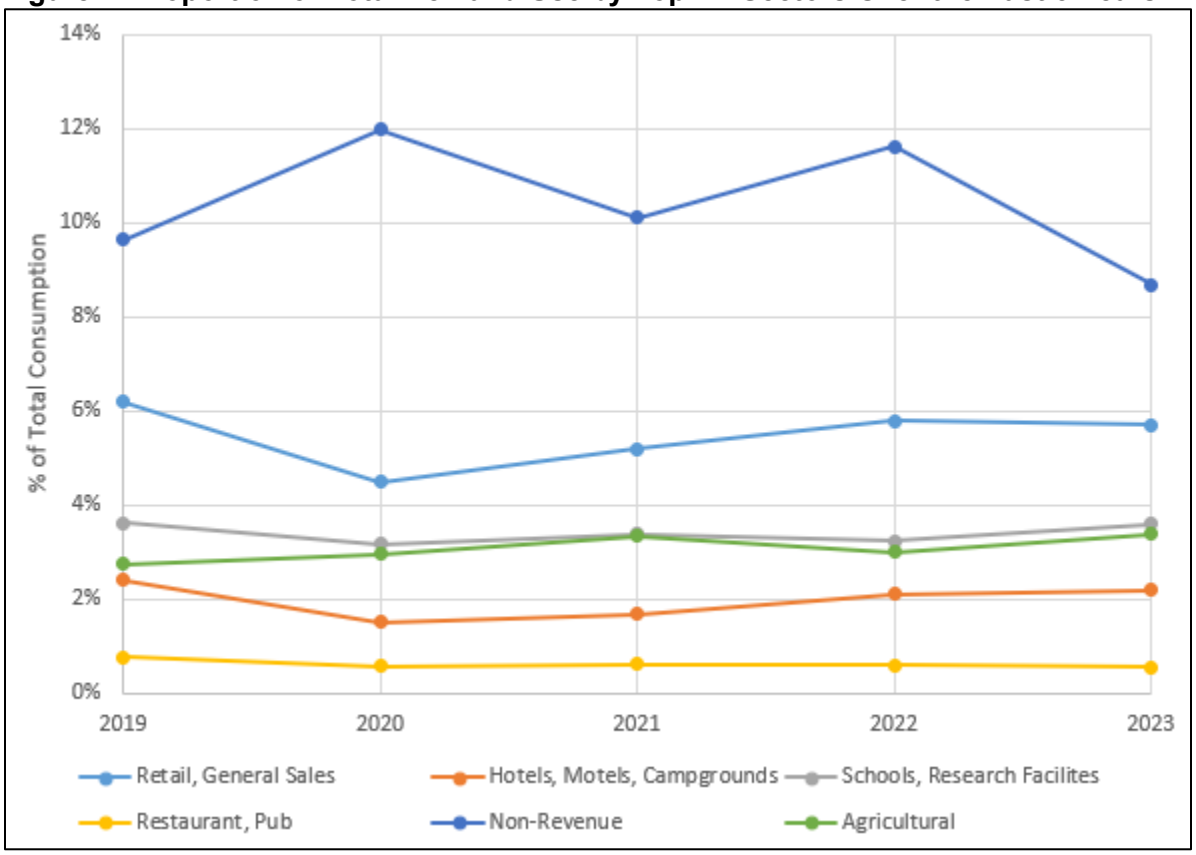
SECTION 2. INDUSTRIAL/COMMERCIAL/INSTITUTIONAL WATER CONSERVATION

Background

The Industrial/Commercial/Institutional (ICI) program promotes water use efficiency to help reduce operating costs, energy and greenhouse gas consumption, both at the business level, primarily due to less energy used to heat water, and at the larger regional level.

The retail water use data has consistently shown that the top five ICI categories are retail and general sales, schools and research facilities, agriculture, hotels, and restaurants and pubs, as shown in Figure 1 with non-revenue consumption for comparison.

Figure 1. Proportion of Total Demand Use by Top ICI Sectors Over the Past 5 Years



Water Use Assessments

The ICI demand management program historically had a larger complement of staff and conducted in-depth water use audits for several larger institutions and commercial facilities. Since 2017, smaller water use assessments were conducted producing succinct reports that demonstrate the business case for conserving water to promote the adoption of water-efficient fixtures and practices.

Starting in 2019, water use assessments were integrated with the Climate Action Program to add energy use and some greenhouse gas emission reduction planning to the reports. Participating

facilities also receive free replacement faucet aerators, information on rebate programs such as the Once-Through-Cooling (OTC) rebate, and other best practice recommendations. The first sector these assessments were offered to was hotels, since they were likely to have OTC equipment, the replacement of which results in immediate and cost-effective reductions in water use.

In 2020, specific high water-using accounts were identified by a consultant report. Based on those findings, the retail and general sales category was targeted next, separated into grocery stores in 2021, and malls in 2022. Because assessments are voluntary, several of the highest users declined to participate. In 2023, the focus turned to the schools and research facilities category. The large institutions (e.g., University of Victoria) had previously been audited, so the assessments focused on high schools.

Estimated savings if all recommendations were implemented, including the savings from faucet aerators and pre-rinse spray valves that were replaced for free by the CRD during site visits, are:

Sector or Sub-sector	Estimated Annual Water Savings (m^3/year)	Estimated Annual Emissions Savings (tCO2e/year)
Hotels	106,000	180
Grocery stores	16,500	170
Malls	27,000	55
High schools	10,500	Not calculated
Total	160,000	405

The largest reductions in water use were found by replacing once-through cooling equipment, discussed below. The quickest return on investment was found by replacing additional hand faucet aerators.

Once-Through-Cooling Regulation

CRD staff initially amended the *Water Conservation Bylaw* to ban the use of once-through cooling (OTC) devices in 2016; however, the ban was rescinded in 2018 due a conflict with the BC Building Code and the regulatory powers of local government. Meetings with provincial staff occurred in 2021, and CRD staff explored alternate regulatory options, completed a legal review, and proposed wording to include a ban on the use of water from the Greater Victoria Drinking Water System in OTC devices. *The Water Conservation Bylaw* amendment was approved by the CRD Board in 2023, and the new ban goes into effect in 2028.

Once-Through Cooling Rebates

Staff were directed to advertise and administer an OTC equipment replacement rebate program in the 2022-2026 budgets, for a total amount of $20,000 per year. Beyond the operating cost and environmental savings, the rebate program increases the incentive to replace OTC. The program has been promoted through advertising to sectors identified as likely to use OTC, direct mail-outs to businesses confirmed to have OTC, and refrigeration service providers.

Uptake on this program has been low and only $3,000 in rebates have been issued to date. Communication with owners of OTC units indicates that systems have been changed out without

applying for the rebate program. Known OTC replacements to date, including those identified during water use assessments prior to the rebate program, are estimated to save 35,000 m^3/year of drinking water.

Aerator Replacement Program

CRD staff visited commercial facilities on a voluntary basis that used water supplied by the Greater Victoria Drinking Water System and replaced any inefficient hand sink faucet aerators for free. Over 400 aerators were replaced, saving an estimated 15,000 m^3/year. Savings from aerators replaced during water use assessments are included in the estimates for the assessment program above.

Agricultural

An Agricultural Water Demand Model Report was prepared by the Ministry of Agriculture for the CRD in 2019 to more accurately estimate the total water needed for agricultural irrigation. A large portion of the irrigation in the region is from the Greater Victoria Drinking Water System. The report found that vegetable irrigation was primarily accomplished through efficient irrigation methods; however, most agricultural use in the region is for forage crops. The report found that improving irrigation efficiencies would be an effective approach to reduce consumption. It also estimated significant increase in water demand due to climate change, despite limitations to the model.

Current Initiatives

In addition to the above program components, other than the aeration replacement program, in 2024 the ICI Water Conservation program has two new focuses. Reducing early morning water demand is a primary focus for the spring and summer months, while continuing the smart flow monitor pilot and building relationships with property management groups will take place in the fall and winter.

Water Use Assessments

Water use assessments continue to be conducted each year. Facilities that have received assessments in previous years are also followed up with to assess progress on recommendations and support implementation. In 2024, staff are focusing on secondary and middle schools as a sub-sector of the schools and research facilities category. In addition to recommendations highlighting the business case for conservation, this year, participating facilities will also be informed of the amendment to the watering schedule as outlined in the *Water Conservation Bylaw.*

Once-Through Cooling Rebates & Regulation

Advertising for the OTC equipment rebate will continue this year, pending availability of space in the annual communications schedule. To encourage uptake this year, the application requirements will be simplified, and CRD staff will reach out directly to property management groups who stand to see the benefits of the utility costs savings. Messaging continues to focus on informing businesses that the rebate program ends in 2026 and that the bylaw ban of the use of water from the Greater Victoria Drinking Water System in this equipment goes into effect in 2028.

Multi-Use Residential Buildings

As discussed in the Residential Water Conservation program section above, the ICI program is also working to help identify MURBs that are high water users and target them with specific messaging highlighting the business case for strata councils and property or building managers to encourage water efficiency in MURBs.

Smart Water Flow Monitors

A pilot study using smart flow monitors and real-time leak detection technology started in 2023 and continues in 2024. The study started as a collaboration between CRD Climate Action and CRD Facilities Management to identify the cause of abnormal water usage at the CRD Headquarters building. The pilot also included two MURBs owned by the Capital Region Housing Corporation and one commercial building, in collaboration with City of Victoria water billing staff. Most pilot participants so far have achieved significant reductions in the use of water through reduction in leaks and education and awareness of their unique water usage patterns. The monitors being used in the Residential End Uses of Water Study discussed above were designed to work best in single-family residential settings but are expanding into the MURB market. The ICI pilot study is using monitors designed to work best in office and MURB buildings.

Agricultural

While the relative proportion of water used by the agricultural sector has remained steady at approximately 3%, the total volume has been increasing. In 2023, the volume of water used by agriculture increased by 20% relative to 2022 and was 16% higher than the three-year average. Recognizing the importance of local food security and climate-related challenges faced by the agricultural sector, planning is underway to expand knowledge of agricultural water use due to increasingly hot and dry summers, as well as peak hour demand effects. Additional supports and expertise are needed.

Fix-a-Leak Week

While the water conservation program has always had an annual messaging campaign that encourages residential users to check for leaks and educates homeowners about leak detection best practices to reduce the amount of potable water loss in the region, this year, the campaign was expanded to include similar messaging for commercial users.

Peak Demand

Targeted outreach to ICI users that have irrigation systems has begun. 960 businesses and 40 parks and municipal staff were contacted to share an information sheet and ask that automatic timers be adjusted to outside the peak hours. Follow-up phone calls to the highest volume users are also underway, including schools and research facilities, golf courses, parks & recreation facilities, and municipal green spaces.

Future Initiatives

Water Use Audits

It is expected that the water use audit program will continue; however, in the future, it may be more efficient to focus assessments on the type of usage rather than business sector. According to industry experts, cooling towers, on average, account for 40% of a building's water demand. Increasing the efficiency of this equipment is a prime opportunity for significant water savings. Research identifying buildings with cooling towers, as well as staff resources to dedicate to follow-up verification, are both needed to realize this potential.

Reported assessment results from the high school sector show that some schools have high demand during the summer when students are not present, indicating that irrigation is likely a driving factor. There currently are no local consultants that perform irrigation audits, which are a specialized skill set. More work is needed to develop this expertise in the region.

Once-Through Cooling Regulation

The Demand Management program will shift from rebates to regulation of OTC equipment. Advertising has already begun to inform ICI water users of the impending ban. Planning on the mechanism for inspections and enforcement is underway, but it is expected that efficiencies can be found by relying on staff with plumbing expertise to incorporate the regulation of the *Water Conservation Bylaw* into their existing inspection schedule.

Incentives

Results from the ICI smart water flow meter pilot will be evaluated for a potential incentive program to encourage the adoption of smart and leak-detecting monitors in commercial and institutional applications. This technology can help achieve significant reductions in water use by showing building owners and managers their unique usage patterns and alerting them to leaks, preventing water wastage and saving them money. Staff will compare the effectiveness, cost and ease of installation of the monitors being used in the Residential End Uses of Water Study compared to the monitors from the pilot, as well as perform a market analysis to determine the best technology to promote.

Multi-Use Residential Buildings

CRD staff are also participating in a Residential End Uses of Water Study starting in 2024, which will further help identify usage trends to help customize messaging for this sector specific to the CRD. This information will help direct the creation of materials specifically for property managers, owners and strata councils and to promote the business case for water efficiency, as well as the adoption of smart flow monitoring technology.

Agricultural

It is expected that issues due to peak hour demand effects will increase over the coming years if not mitigated soon. To effectively work with this sector, more knowledge regarding variables such as the number of hectares being farmed, hectares being irrigated, irrigation techniques and efficiencies, future agricultural build outs, types of agricultural activities in the region (local food supply, forage crops, hobby farms) and the volume of local food supply should be built on for a greater understanding of agricultural demands. To successfully achieve this, additional support and expertise are needed.