



The Corporation of the City of Courtenay

Staff Report

To: Council
From: Beth Brooks, Engineering Technologist – Utilities
Subject: **Water Conservation - Seasonal Water Use Increases**

File No.: 5600-08
Date: February 26, 2025

PURPOSE:

The purpose of this report is to provide information regarding the seasonal increases in the City of Courtenay's annual potable water consumption relative to its forecasted consumption volumes. This report includes recommendations for immediate actions to reduce seasonal water demand due to lawn watering by increasing bylaw enforcement of the CVRD's Comox Valley Water Conservation Bylaw No. 2010 including ticketing, and seeking Council's support in sending a request to the CVRD Water Committee for consideration of a bylaw amendment to both Stage 1 and Stage 2 watering restrictions to effectively reduce the allowable hours of watering for lawns.

BACKGROUND:

The City of Courtenay is required to forecast the City's annual potable water consumption and budget for said amount within the water utility financial plan. This forecasted value is based on several factors including, but not limited to, year over year annual trended use, population growth, environmental changes (factors), and conservation strategies (measures and goals).

As established by the City's Water Regulation Bylaw No. 1700, the City follows the water use restrictions as prescribed within the CVRD Comox Valley Water Conservation Bylaw No. 2010. Under this bylaw Stage 1 restrictions start each year on May 1st, with Stage 2 restrictions starting July 1st. As stated in Section 5 of the bylaw the timing of Stage 3 and Stage 4 restrictions are contingent on water flows within the Puntledge River. These flow requirements are included in the CVRD's provincial water license and stem from the CVRD's agreement with BC Hydro.

Prior to the water treatment plant commissioning, the timing and duration of water restrictions in the Comox Valley fluctuated based on environmental conditions and in response to BC Hydro's annual maintenance shutdowns. Starting in 2023 the CVRD amended the bylaw to include the fixed start date for Stage 2 on July 2nd each year to allow residents to plan for irrigation scheduling changes. In 2023, Stage 3 water restrictions were put into place on September 11th with all restrictions being lifted on September 27th. In 2024 Stage 2 restrictions were maintained from July 1st until all stages were rescinded in the fall. The expected reduction in seasonal water use in response to earlier Stage 2 restrictions has not been realized by the City.

Education and Outreach

Starting in 2018 the City shifted the focus from an education and enforcement program strictly through Bylaw Services to a blended education and outreach program using student Ambassadors in Operational Services, with follow up by Bylaw Services as and when necessary. As per the City's Bylaw Enforcement Policy, 'voluntary compliance is the first goal of bylaw enforcement', where further action would not be taken if the violation ceases. Historically, the City has taken an education and outreach approach to watering restriction compliance with no recent issuance of tickets. The student Ambassadors are employed from early May to the end of August and split their workload between Water Services and Solid Waste Services. Students conduct daily morning patrols targeting areas known for high irrigation use as well as other areas within the City. Doorhangers are dropped off at homes viewed or reported as watering outside of the

restrictions, after the delivery of two notices Bylaw Services provides a follow up in-person visit to speak to the resident¹. In some instances, notification letters have been mailed out in place of the doorhangers. The students also provide water conservation tips and information about the current water restrictions to residents through their door-to-door neighbourhood visits and attendance at the Canada Day event.

It is known and expected that watering infractions are being missed due to having no ability to monitor after-hours. The student Ambassador's working hours limit their water patrols between 7:30 a.m. to 3:30 p.m., Monday to Friday. Outside of these hours the program relies on residents reporting infractions to Bylaw Services or Operational Services.

¹ In 2024 there were 287 infractions, which included 37 repeat infractions. Operational Services requested 2 follow up visits from Bylaw Services.

DISCUSSION:

As an outcome of the work being completed for the Water Metering Business Case, staff did a review of the 2015 to 2024 City annual water consumption data. This review found that in 2023 the City had four of the highest monthly consumptions, being February, May, June, and August, and 2024 had six of the highest monthly consumptions in January, April, July, October, November and December. See Figure 1 for the monthly water consumption volumes for the past six years.

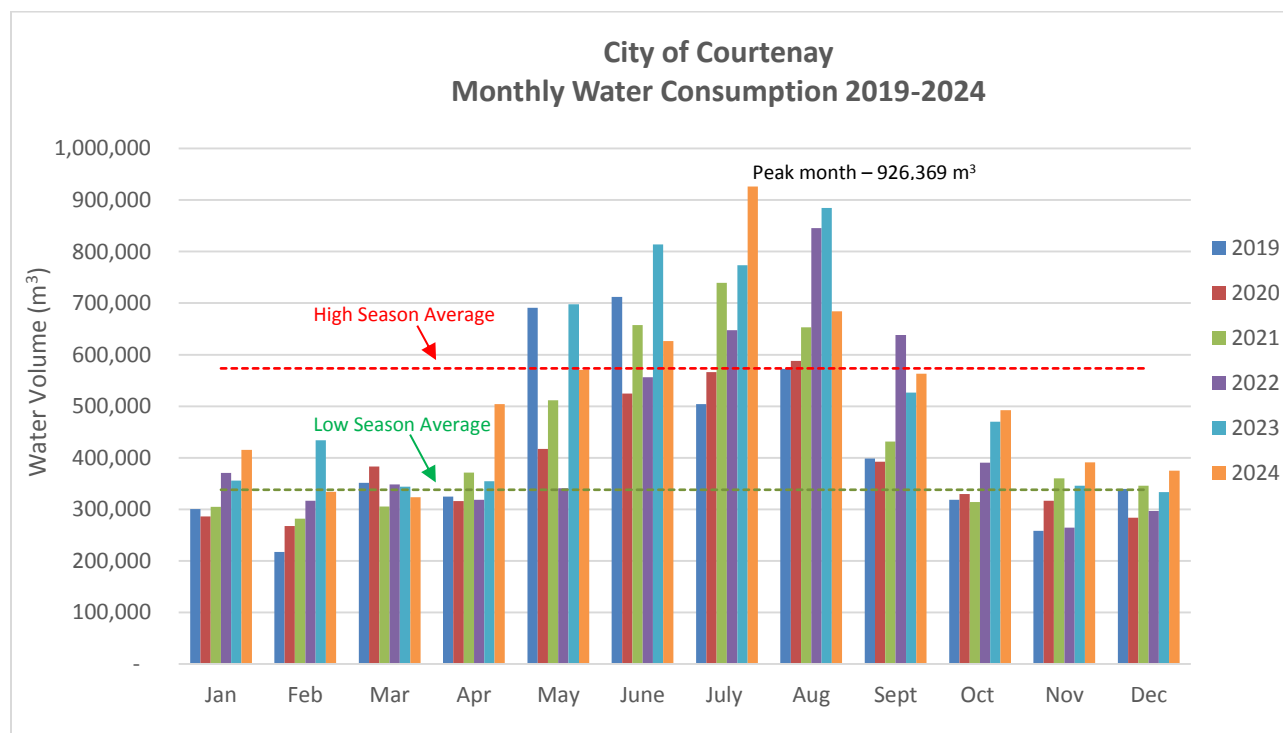


Figure 1. Monthly water consumption 2019-2024.

In 2023, the City's annual water consumption exceeded the projected amount by 727,676 m³ which equated to a nearly \$700,000 higher than budgeted CVRD bulk water charge. In 2024, the peak month consumption in July of 926,369 m³ which was the highest recorded monthly consumption from 2015–2024. Seasonal outdoor water use in 2023 and 2024 accounted for 27% of the total annual water use, costing approximately \$1.6 million per year in bulk water charges.

Under a business as usual scenario, this trend in total potable water consumption is expected to remain, requiring the City to increase its annual water budget by \$750,000 per year moving forward. This has been

included in the 2025-2029 financial plan where the cost will be recovered through a one-time increase of approximately \$75 in the household water utility fee.

Irrigation Demand Impacts

The City and the CVRD use what is called a 'Peaking Factor' to portray what the average system consumption is compared to a seasonal high or peak demand i.e. the ratio between average daily and maximum daily demand. The peaking factor is also used to determine the size and design of watermain for new development or replacement. In 2023, peak consumption occurred in August with an average daily consumption of 28,500 m³/day compared to a baseline consumption of 12,000 m³/day resulting in a peaking factor of 2.4. In 2024, peak consumption occurred in July with an average daily consumption of 30,000 m³/day, resulting in a peaking factor of 2.5. The desired peaking factor is closer to 2.0, with long term conservation efforts aiming for less.

The following graphs depict a snapshot of the demand seasonal watering has on the distribution system using data from the CVRD 138 Zone Pump Station and the Beachwood Pump Station.

The CVRD pumps at the Courtenay East reservoirs supply water to the City's 138 zone which includes the Crown Isle resort development, the Crown Isle Boulevard area, the Mission Road area, and the area below Lerwick Road between Evergreen Drive and Malahat Drive. The combined maximum output of the CVRD pumps at 360 Hz was nearly reached at 357 Hz on July 16th starting at 5:55 a.m. and again at 8:05 p.m. The peak flow periods for July 16th are depicted in Figure 2 and align with the sprinkling hours under Stage 2 water restrictions.

As a result of this increased demand, two additional pumps are being commissioned by the CVRD at this location in 2025.

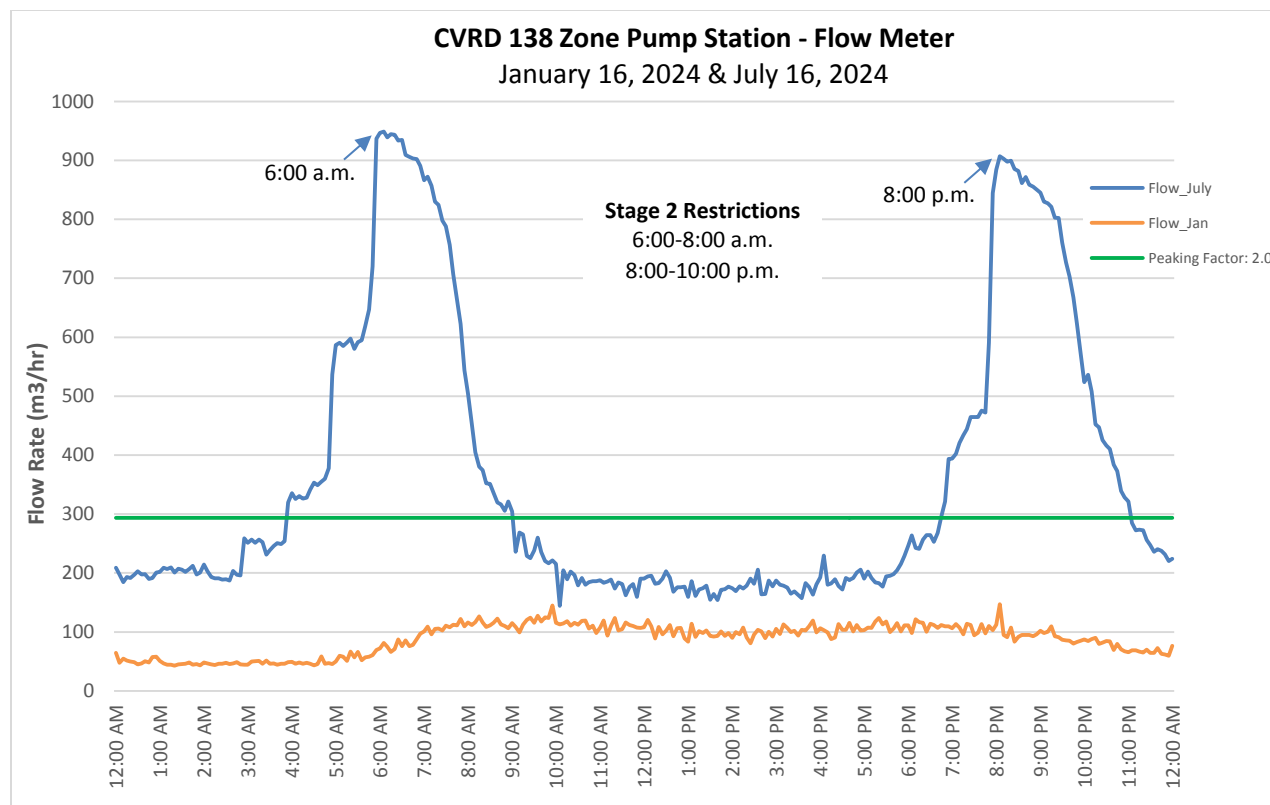


Figure 2. CVRD 138 zone flow meter.

The Beachwood Pump Station is the only feed into the Buckstone development area in South Courtenay. The graph depicts the water meter flow rates on July 20th and December 2nd, 2024 for comparison. The pump station contains three domestic pumps and two fire pumps. On July 20th, to meet the outdoor irrigation demand, one or both of the fire pumps were engaged over a 1.5-hour time period in the morning and for 1 hour in the evening. During these periods of maximum output, the serviced areas are at risk as any further demand i.e. fire flow, would not be achievable.

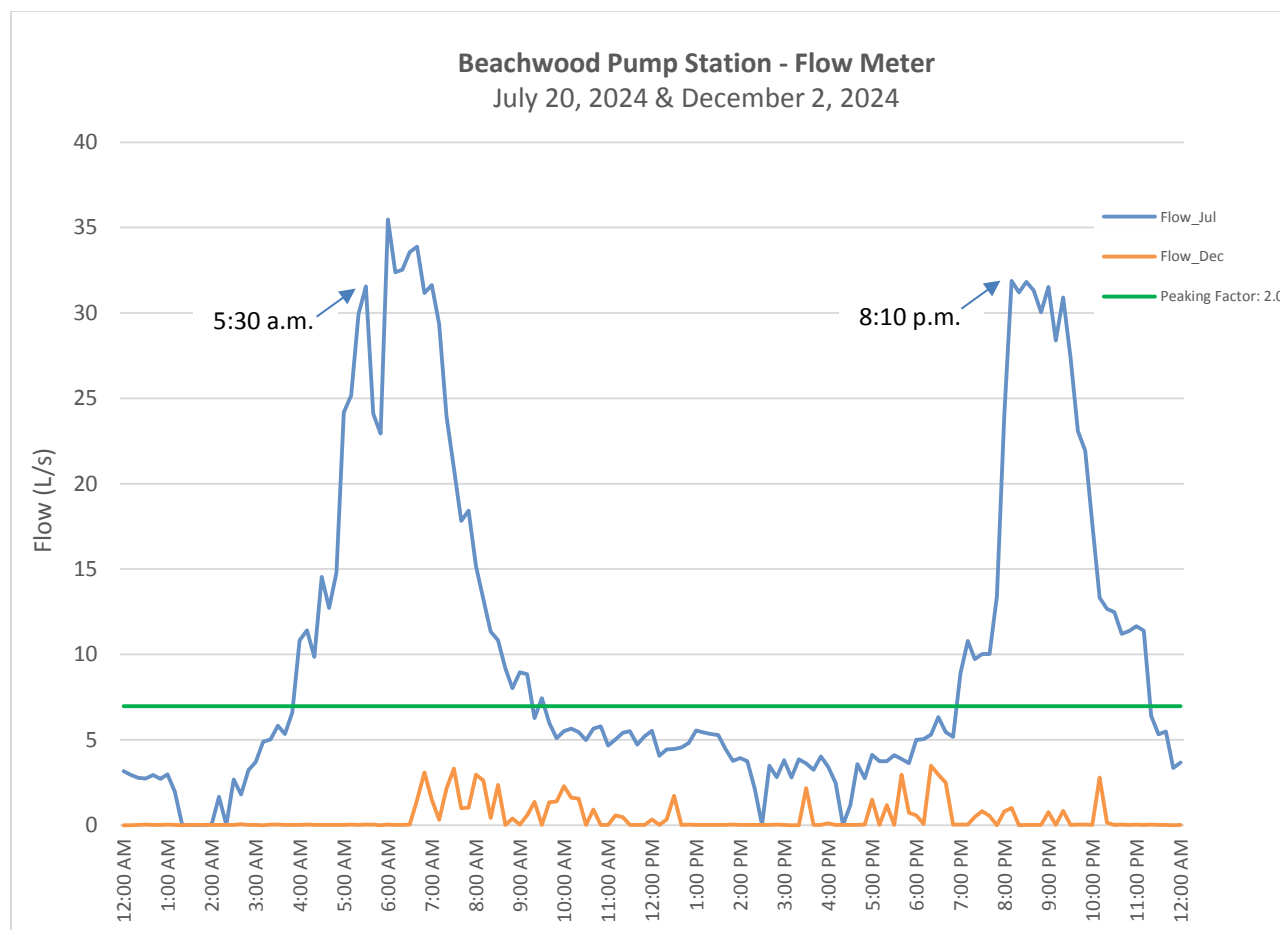


Figure 3. Beachwood pump station flow meter.

Water Conservation

In the Water Smart Action Plan the summer peak month 2050 target for water use is 580 L/capita/day. The current measure is 952 L/capita/day (July 2024), requiring a 39% reduction in peak month water use over the next 25 years.

In the Comox Valley, under Stage 1 restrictions residents have the ability to water their lawns eighteen hours per week and under Stage 2, eight hours per week. Comparatively, in Metro Vancouver under Stage 1 restrictions lawn watering for automatic systems is limited to two hours on Saturdays (even-numbered addresses) and two hours on Sundays (odd-numbered addresses) for a total of just two hours per week. Lawn watering is not permitted under Stage 2. In the Cowichan Valley Regional District, under Stage 1 restrictions lawn watering is limited to two hours per day, two days a week (four hours total) and under Stage 2 restrictions two hours a day, one day a week.

The irrigation of lawns is, in part, the cause of seasonal increases in water use. With proper maintenance, lawns only require one inch (2.54 cm) of water each week. There is variation between irrigation emitters as well as differences in infiltration rates of soil to determine the required irrigation time to apply one inch of water. Methods for calculating the timing of individual systems will be promoted in the education and outreach campaign for proper lawn management. The City will also continue to promote the CVRD water conservation rebates for soil amendments and smart irrigation controllers.

It is recognized that universal metering is a water management tool that can result in 20-30% decreases in water use. Reductions in use are attributed to the ability to identify private side service leaks and incentivize behaviour change when a water conservation rate structure is put into place. The City has recently completed a water metering business case with Water Street Engineering that will be presented as a separate report in early 2025.

RECOMMENDATIONS:

Enforcement

Given the recent increases in seasonal water use the City must consider shifting the current education and outreach program to an approach that includes ticketing. The change would see tickets being issued following two infractions where the resident has been notified either by doorhanger or by a direct visit from Bylaw Services.

In 2025, Operational Services is requesting dedicated after-hours staff time from Bylaw Services to enforce the water restrictions bylaw as an immediate step in reducing summer water consumption. Hours of work would include evenings and weekends. During Stage 2 restrictions, 2024 data indicates outdoor watering is being initiated an hour prior to both the morning and evening watering times which aligns with the Stage 1 allowable hours. In 2025, Operational Services will be requesting Bylaw Services support for early morning and early evening patrols when the data trending indicates infractions are occurring.

With more enforcement in place seasonal water consumption will be monitored through 2025. If there has been a successful reduction in monthly water consumption, determined through the peaking factor, the recommendation will be that the increased summer enforcement activities remain in place.

Education and Outreach Campaigns

Operational Services will continue the student Ambassador education and outreach program promoting water conservation to residents and monitoring watering infractions during regular work hours. Staff will work with Communications in developing a water conservation campaign for social media, public events, and at City facilities with a focus on proper lawn maintenance.

CVRD Comox Valley Water Conservation Bylaw No. 2010 Changes

With the overall goal to reduce seasonal lawn watering, City staff approached CVRD staff with a recommendation for a reduction in the current watering times available to residents under Stage 1 and two hours per day one day a week under Stage 2.

Given the CVRD is currently working to complete its Water Master Plan update, CVRD staff proposed completing the water modelling exercise to estimate potential water reductions and impacts to infrastructure before changing the restrictions. A concern is the potential impact on the peak hour demand, as compressed watering hours could have a negative impact on current infrastructure, relative to station capacities and or fire suppression requirements. If the modelling results are favourable for a reduction in watering hours the CVRD will include them as one of the water conservation initiatives in the plan. These

changes may be expedited in 2025 as a phased approach where further actions would follow in 2026 when the plan is complete.

City staff remain steadfast in recommending that a significant reduction in the available time permitted under the bylaw for lawn watering be of the highest priority for implementation in 2025, as the impact on consumption is of the highest use during the summer months. Staff recommends that the CVRD review and consider the impact of implementing an initial reduction in lawn watering hours by a third for both Stage 1 and Stage 2 in 2025, followed by further reductions in 2026.

The draft letter to the CVRD Water Committee is attached as Appendix B.

FINANCIAL IMPLICATIONS:

The cost of Bylaw Services after-hours enforcement of the watering restrictions will be included in the Water Services budget. The estimated cost for enhanced enforcement is unknown at this time. While Stage 1 and Stage 2 watering restrictions are effective on a fixed schedule, community watering demands are also based on environmental conditions. Equally, the city has yet to realize the effectiveness of stricter enforcement measures. Staff anticipate that the current water conservation operating budget will be adequate to accommodate the increase in staffing resources within the 2025 fiscal year and will report on metrics relative to future years financial and resource needs.

Water system design considers peak demand in determining water main sizing, reservoir capacity and pumping needs. To meet the continued high peak demand the CVRD will be installing two additional pumps at the East Courtenay reservoirs in 2025. Upsizing and upgrading CVRD water transmission infrastructure to meet increasing peak demands are funded through an increasing bulk water rate charge to the municipalities.

ADMINISTRATIVE IMPLICATIONS:

After-hours water infraction monitoring will be completed with current staff complements and within current program funding.

STRATEGIC PRIORITIES REFERENCE:

This initiative addresses the following strategic priorities:

- Municipal Infrastructure - Continue implementing water conservation measures; Review and update Watersmart Action Plan

PUBLIC ENGAGEMENT:

Staff would inform the public based on the IAP2 Spectrum of Public Participation.

OPTIONS:

1. THAT Council receive the *Water Conservation - Seasonal Water Use Increases* report and direct staff to dedicate resources towards water restriction enforcement in 2025 from May 1st to August 31st, including evenings and weekends; and
THAT Council endorse the draft letter and direct staff to send the letter to the Comox Valley Regional District (CVRD) Water Committee, on behalf of City Council, requesting an amendment to the CVRD's *Comox Valley Water Conservation Bylaw No. 2010* for a reduction in weekly lawn watering hours under Stage 1 and Stage 2 water restrictions.
2. THAT Council receive the *Seasonal Water Use Increases* report for information and take no further actions.
3. THAT Council provide alternative direction to staff.

ATTACHMENTS:

1. Appendix A - Draft Letter from City Council to CVRD Water Committee: Amendment of Bylaw No. 2010
2. Appendix B - Seasonal Water Use Increases - Council Presentation

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