Coquitlam

For Council

April 20, 2021
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To: City Manager
From: General Manager Engineering and Public Works

Subject: **Enhanced Water Conservation Strategy**

For: **Council**

Recommendation:

That Council endorse the Enhanced Water Conservation strategy outlined in the report of the General Manager Engineering and Public Works dated April 20, 2021 entitled "Enhanced Water Conservation Strategy".

Report Purpose:

To enhance the existing water conservation strategy and demonstrate regional leadership in water conservation.

Strategic Goal:

Coquitlam has a robust existing water conservation strategy, and could further enhance this strategy to align with the Strategic Plan goals of *Sustainable Services, Environment and Infrastructure* and *Excellence in City Governance*. Water conservation was also referenced as a key item within the Climate Adaptation Strategic Plan, and will be embedded as a key component of the upcoming Environmental Sustainability Plan.

Executive Summary:

Coquitlam receives drinking water from Metro Vancouver through three lake reservoirs that spill over in the rainy winter season, demonstrating excess water supply for most of the year. However, these reservoirs are drawn down during the hotter and dryer summer months when there is less precipitation and additional water use. For context, the summer water consumption in Coquitlam is typically 55% higher than winter water consumption (see Figure 1).

Coquitlam already has a comprehensive water conservation plan, and this report outlines further options to enhance this plan, with a key target to ensure there is no net increase in overall summer time consumption over the next 10 years, while still enabling robust population growth. This target is intended to highlight the regional ability to reduce water demand and thus delay the need for planned major regional water supply projects. For more context, the Metro Vancouver Board has approved Coquitlam Intake No. 2 as the next location for additional regional supply, and this project is estimated to cost more than $2.5B and is anticipated to be required in the late 2030's. Coquitlam's share of this overall project cost is 5% or more than $125M.

The various measures outlined in this report demonstrate regional leadership in water conservation, and target all of the water consumption categories (residential, ICI (industrial, commercial, and institutional), and leakage).

The Water Conservation Strategy received sufficient advance funding in 2020, and the budget and effectiveness will be evaluated in future years, with reports back to Council to adjust as necessary to meet the conservation target and overall consumption levels.

Background:

There are three main considerations for the future water system in Coquitlam – climate change, population growth, and affordability.

Climate change modelling predicts longer and dryer summers, which will reduce the summertime water supply. The overall system consumption also currently significantly increases during the summer, which leads to the existing reservoirs being drawn down.

Figure 1 – Seasonal Water Supply and Consumption (Coquitlam only - 2019)

In line with the Regional Growth Strategy, Metro Vancouver and Coquitlam anticipate continued population growth, which will require additional investment in regional water system growth, and also necessitate consideration of the customer's ability to pay. Fortunately, water conservation efforts across the region over the last 30 years has led to steadily decreasing per capita consumption (see Attachment 3), which has helped defer growth-related investments that would otherwise have been required. Overall water consumption has fluctuated since the 1980's with only modest growth despite the population doubling. There has been a noticeable decline in overall consumption since 2001, with recent regional consumption holding steady (see Figure 2).

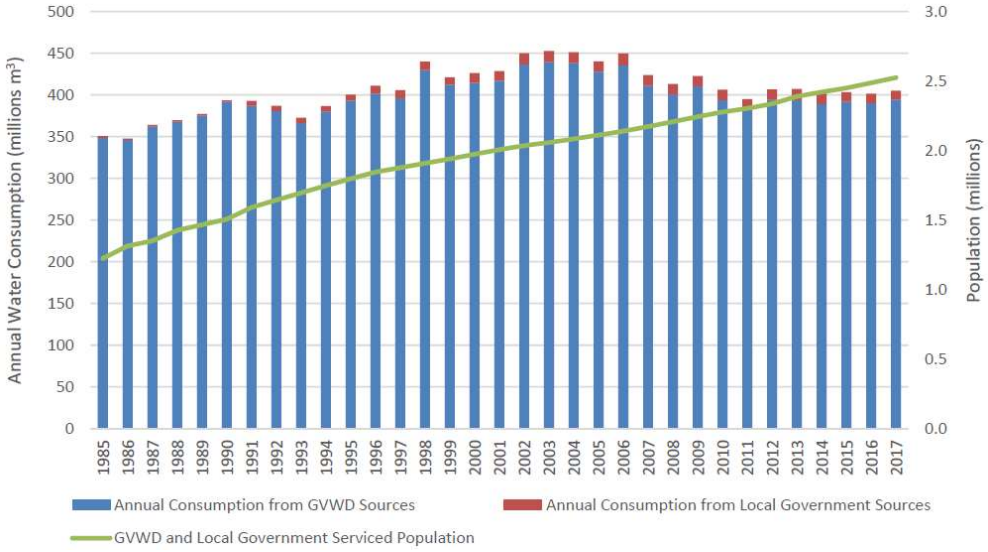


Figure 2 – Population Growth vs. Water Consumption (Regional Data)

Water use in Coquitlam is currently estimated as follows:

Customer Category	Overall Consumption (%)
Commercial, institutional, and industrial (ICI)	14%
Residential (single-family and multi-family)	71%
Leakage (estimated)	15%

Table 1. Water Use Categories

Coquitlam is also developing an Environmental Sustainability Plan (ESP) that links to sustainable potable/drinking water use for both the City and community. This plan is intended to incorporate the City's environmental goals and objectives into a cohesive strategy to guide future decisions and support long-term environmental resiliency and sustainability of the community. The ESP is structured around five interrelated themes of Climate Action, Built Environment, Water Management, Waste Management, and Natural Areas, Wildlife and Habitats.

The Water Management theme proposes key goals and supportive strategies that give direction for actions aiming to increase the resiliency of the drinking water system and reduce overall use by the City and community.

Discussion/Analysis:

The water system has the highest demand and lowest supply during the hot and dry summer months, and a major driver of water system cost relates to summer time consumption and associated water storage and supply.

Therefore, a key target for Coquitlam is to enhance water conservation efforts to ensure there is no net increase in average overall summer time consumption over the next 10 years (while still enabling robust population growth). This could help ensure that Coquitlam is doing everything reasonably possible to defer large regional system supply upgrades, thereby keeping water rates as low as possible.

The key regional supply upgrade project currently being planned is the Coquitlam Lake Water Supply project, which includes Coquitlam Intake No. 2, estimated over $2.5B. Coquitlam's share of this project based on percentage of overall regional water consumption is 5% or more than $125M. This project is currently projected to be required by the late 2030's, but advances in water conservation could delay this timeline further. Conversely, a lack of progress in water conservation could require this project to be in-service even sooner.

Coquitlam has comprehensively researched local water conservation practices, and have identified the following water conservation opportunities to support achieving this key goal. The opportunities are organized into conservation related to consumption directly by the City of Coquitlam and consumption by residents and businesses. These considerations build upon a 2014 Water Conservation Program Review completed for the City of Coquitlam, by Econics, a consultant specializing in water demand management (see Attachment 2). The effectiveness of these measures will be evaluated over time and adjusted as necessary to meet the key target.

City of Coquitlam Water Conservation Opportunities

Coquitlam can demonstrate leadership in water conservation in the following areas:

- **City irrigation via groundwater (WC1)** – A test well was drilled on the south side of the Town Centre Park area to support irrigation through groundwater instead of potable water. The feasibility and cost estimate is under review, and the next steps will be presented to Council in T2. Based on the results, additional areas with high irrigation demand could be considered for additional wells. Preliminary future locations could include the north side of Town Centre Park, Mackin Park, the Robinson Memorial Park Cemetery, or Mundy Park. The City also regularly fills water trucks for irrigation and sewer main flushing, which could alternatively be filled using groundwater.

- **Additional leak detection (WC2)** – Within the last 2.5 years, the entire City has been assessed for leaks through a combination of data loggers and correlators. Through this technology and other measures, over 200 water service leaks have been found and repaired in 2019 and 2020. The City will purchase some additional and improved leak detectors in 2021, and target inspection of 50% of the City's water system per year, focusing first on the oldest neighbourhoods with a higher likelihood of leaks. Future reporting will also clearly identify which leaks were found through pro-active leak detection versus other measures, to confirm the efficiency of this active leak detection program and determine the optimal detection re-assessment frequency.

- **Water Audit of Civic facilities (WC3)** – To demonstrate leadership in water conservation, the City will conduct a water audit of Civic Facilities in 2021 in order to identify and improve any water conservation opportunities. The results of the water audit would help prioritize any water-related upgrades in 2022 and beyond. A water audit was also a recommendation of the 2014 Water Conservation Program review, and is supported by the Environment and Facilities teams.

Residential and Business Water Conservation Opportunities

Residents and businesses can be supported to increase conservation in the following areas:

- **Increase sprinkling regulations (WC4) –** The current regional Stage 1 water restrictions are implemented annually from May 1 – October 15, and limit residential sprinkling to two days per week. Stage 2 sprinkling restrictions restrict residential properties to sprinkle only one day per week, and are triggered as necessary to protect water supply during dry and hot periods. For further context, residential lawn watering is currently fully prohibited under Stage 3 water restrictions.

  With Council approval, Coquitlam staff will advocate to Metro Vancouver to review options to reduce allowable residential watering days for Stage 1 water restrictions from 2 days per week to 1 day per week. This would align with the regional education messaging, where '*1 hour is all you need*' for a healthy lawn. However, as this could further concentrate peak daily demand, it would be important to spread the allowable watering days over four or more days per week, rather than just two days per week.

  Tree and shrub sprinkling will also reviewed, as the current restrictions allow daily sprinkling of trees and shrubs throughout Stage 1 and 2.

- **Water Conservation Education (City-wide) (WC5)** – Additional targeted promotional materials will be developed and distributed, using the base Metro Vancouver documentation where applicable for consistency, focusing on efficient irrigation systems and drought tolerant landscaping. This messaging would be coordinated with the Environmental Sustainability Plan and targeted to be released during the dryer summer months.

- **Water Conservation Education (ICI customers) (WC6)** – Existing metered data will be analyzed to identify the highest consumers, and targeted conservation education and support plans prepared accordingly. The automated meter reading project (AMI) already underway will also provide near real-time detailed consumption data, which will help metered customers better understand their consumption patterns and identify active leaks, which will help reduce overall consumption and associated cost.

  Further, Coquitlam could share the results and benefits of our groundwater investigation with other high irrigation customers (e.g. Vancouver Golf Club, etc.).

- **Review of non-potable and greywater reuse systems (WC7)** – The use of rainwater, groundwater, and greywater re-use systems will be investigated to reduce water demand. These systems could be considered for larger multi-family and commercial developments, and some existing case studies are already being reviewed regionally, through the work of the REAC water subcommittee. These systems require close coordination with Fraser Health, as certification would be required. The business case would also need to be reviewed, and would likely only become economically feasible with increased potable water rates.

  On a smaller scale, Coquitlam already offers discounted rain barrels for purchase and specifically encourages rain barrels for single family homes on Burke Mountain. Rain barrels store a portion of the rainwater, which can be used to support lawn and garden irrigation.

- **Rebate programs (WC8)** – Coquitlam has partnered with BC Hydro with a $100 rebate program for washing machines, with 150-300 rebates historically provided each year. However, BC Hydro is modifying the washing machine rebate program, and apart from promotion, the new program will not likely allow an additional municipal rebate. Water timers are also offered for sale at-cost, as water timers support reduced outdoor water use. The toilet replacement rebate program was phased

out in 2015 as recommended in the 2014 Water Conservation Program review, based on the building code changes allowing only low flush toilets. However, the toilet replacement rebate program will be re-started in 2021 as a 1-year trial program, to see if a rebate drives toilet replacements that wouldn't otherwise be happening. The overall rebate program will continue to be monitored and adjusted over time as necessary.

- **Seasonal Water Rates (WC9)** – Metro Vancouver charges a 34% premium for water consumed between June and September, as a financial incentive to drive consumption reduction during the period of highest demand and lowest supply. However, Coquitlam currently charges a single, consistent blended rate throughout the entire year. With implementation of an automated meter reading system underway for existing ICI customers, it would be relatively easy for Coquitlam to adjust the metered water rate to reflect this premium over the summer months and a lower rate over the winter months. However, before making a decision to implement this recommendation, additional analysis will be undertaken, with a separate future Council report.

- **Residential Water Metering (WC10)** –A future separate report will be prepared and presented for Council's consideration in 2021, outlining the benefits, risks, and options associated with residential water metering.

Table 1 below provides a summary of the types of customers, their current percent of citywide water consumption, and potential opportunities to reduce their water consumption.

Customer Category	Customer Count	Percent Consⁿ	Link to Conservation Items and Status
Commercial, institutional, and industrial (ICI)	504	14%	• City irrigation via groundwater (WC1 - underway) • Water audit of civic facilities (WC3 – planned in 2021) • Water conservation education-ICI customers (WC6 – planned in 2021 and ongoing) • Non-potable water re-use (WC7 – under review) • Seasonal water rates (WC9 – under review, for consideration in 2023)
Residential	27,064 SF customers and 27,400 MF customers	71%	• Increase sprinkling regulations (WC4 – under review, dependent on regional cooperation) • Water conservation education-city-wide (WC5 – planned in 2021 and ongoing) • Non-potable water re-use (WC7 – under review) • Rebate program (WC8–ongoing and updated in 2021) • Residential water metering (WC10 – under review, no current time estimate for implementation)
Leakage	N/A	*15%	• Additional leak detection (WC2 - underway)

Table 1 – Water Conservation Opportunity Summary
*estimated amount

Financial Implications:

Any costs related to water conservation can be considered in context of the planned regional water system growth projects, such as Coquitlam Intake No 2 at more than $2.5B, with Coquitlam's share estimated at more than $125M. As summertime water use in Coquitlam currently increases by more than 50%, any advances in summertime water conservation can have a significant ability to delay larger capital investments.

In 2020, Council approved a budget of $500,000 per year to support enhanced water conservation funded through the Water Utility Fund. All of the recommendations listed in the report are within the budgeted amount and itemized within Table 2. However, over time, the budget will be reviewed and adjusted through the annual budget approval process as necessary, with specific attention to water conservation education and enforcement. Depending on customer behavior and compliance with the

drinking water conservation plan, additional staff might be needed to enforce the program, and to complete indoor and outdoor water use audits to help residential customers understand and adjust their detailed water use.

Conservation Item	New 2021 Cost	Future Annual O&M Cost	Comments
WC1 – Groundwater irrigation	$0	*TBD	2021 costs are already funded separately within the capital program
WC2 – Leak detection	< $10,000	$2,000	To purchase additional equipment
WC3 – Water audit	$100,000-200,000	**TBD	Future operating cost savings may provide payback
WC4 – Sprinkling regulations	$0	$0	Advocacy only
WC5 – Conservation education (city-wide)	< $20,000	$0	Material preparation and distribution
WC6 – Conservation education (ICI)	< $20,000	$0	Material preparation and distribution
WC7 – Water reuse	$0	$0	Funded via regional study underway
WC8 – Rebate programs	$50,000	$0	To cover new pilot toilet replacement rebate
WC9 – Seasonal Water Rates	$0	$0	Net zero cost
Subtotal	**$300,000**	**$2,000**	

Table 2 – Financial Implications of Water Conservation

* future O&M costs related to using groundwater for irrigation will be analyzed and presented to Council in a future, separate report.
**potential future annual O&M costs (or savings) will be quantified upon completion of the water audit.

Conclusion:

The benefits of the enhanced water conservation strategy will be evaluated as they are implemented, and further adjustments will be presented to Council as necessary to meet the target of no net increase in overall summer time consumption over the next 10 years (while still enabling robust population growth). This could help ensure that Coquitlam is doing everything possible to defer large regional system supply upgrades, keeping water rates as low as possible.

The Water Conservation Strategy will also be embedded within the Environmental Sustainability Plan, which will be formalized later in 2021.

Jaime Boan, P.Eng.

Attachments:

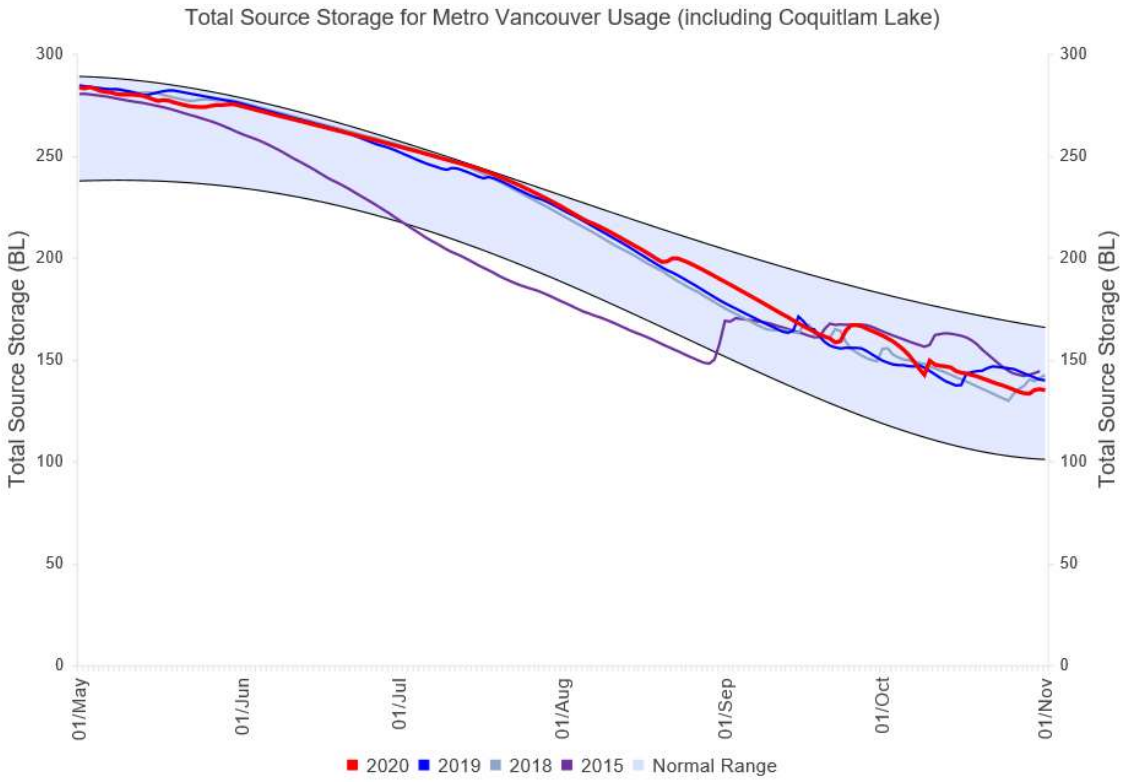
1 – Typical Regional Reservoir Storage Levels
2 – 2014 Water Conservation Program Summary
3 – Residential Per Capita Water Rates
4 – PowerPoint Presentation (CEDMS # 3993112)

This report was prepared by Jonathan Helmus, Director Utilities, with assistance from Caresse Selk, Manager Environment; Gorana Cabral, Manager Financial Planning; and Savik Sidhu, Manager Policy and Business Services.

Typical Regional Reservoir Storage Levels

NOTE: Metro Vancouver posts actual weekly reservoir storage levels from May to October.

http://www.metrovancouver.org/services/water/sources-supply/reservoir-levels/Pages/default.aspx



ATTACHMENT 2

2014 Water Conservation Program Summary

Theme	Program Measure	Status
Theme #1 Municipal Leadership	Public Irrigation System Optimization	Continue
	Non-Revenue Water Management	Enhance
	Municipal Sustainability Policy	Enhance
	Municipal Facilities Audits and Retrofits	New
Theme #2 Technological Efficiency	Implement BC Building Code	Continue
	Implement Landscape Topsoil Thickness Code	Continue
	Water Timer Sales	Continue
	Toilet Replacement Rebate Program	Discontinue
	Rain Barrel Sales	Enhance
	Clothes Washer Rebate (with BC Hydro)	New
	CII Efficiency Program (with Metro Vancouver)	New
Theme #3 Water Stewardship	Lawn Sprinkling Regulations	Continue
	Water Efficient Demonstrations at the *Inspiration Garden*	Continue
	DreamRider Theatre for Grades K-7	Continue
	Regional Partnerships	Continue
	Outreach Officers Program	Enhance
	Community Events Booth	Enhance
	Program Communications Collateral	Enhance
	Outdoor Watering Education Program	New

Residential per Capita Water Consumption (Coquitlam-specific data)