



City of Richmond

Report to Committee

To: General Purposes Committee

Date: April 10, 2024

From: Milton Chan, P.Eng
Director, Engineering

File: 10-6060-02-01

Re: Water Conservation Program Update

Staff Recommendation

That the staff report titled “Water Conservation Program Update”, dated April 10, 2024, from the Director, Engineering be received for information.

Milton Chan, P.Eng
Director, Engineering
(604-276-4377)

REPORT CONCURRENCE		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Public Works	<input checked="" type="checkbox"/>	
SENIOR STAFF REPORT REVIEW	INITIALS:	APPROVED BY CAO

Staff Report

Origin

Over the last few decades, the City has experienced significant population growth. Drier weather conditions are also being seen during summer months due to climate change. This has placed increased demands on the City's water supply system. To address the increased demands, the City has implemented a water conservation program to inform, educate, and encourage residents and businesses to conserve water.

The City's water conservation program consists of a multi-pronged approach to encourage the efficient use of water. The program includes water metering, water pressure management, water use restrictions, leak reduction and detection, and toilet rebate and rain barrel programs. The purpose of this report is to provide Council with an update on the water conservation program.

This report supports Council's Strategic Plan 2022-2026 Focus Area #2 Strategic and Sustainable Community Growth:

2.3 Ensure that both built and natural infrastructure supports sustainable development throughout the city.

This report supports Council's Strategic Plan 2022-2026 Focus Area #3 A Safe and Prepared Community:

3.4 Ensure civic infrastructure, assets and resources are effectively maintained and continue to meet the needs of the community as it grows.

This report supports Council's Strategic Plan 2022-2026 Focus Area #5 A Leader in Environmental Sustainability:

5.1 Continue to demonstrate leadership in proactive climate action and environmental sustainability.

Analysis

In recent years, extended periods of drought conditions have occurred throughout the Province due to climate change, contributing to increased water supply demands. Snow depth levels in southern BC have also been trending downwards in recent decades. For 2024, the Province has advised that there are elevated drought hazards for this upcoming spring and summer, and average provincial snowpack levels were 63% of normal as of April 1, 2024. Since Metro Vancouver's water supply depends on both snowmelt and rainwater, the City has prioritized water conservation initiatives to continue providing a high level of water service to residents and businesses.

Water Metering Program

The benefits of water metering include improved equity, water conservation, leak detection, improved data analysis, and a reduced load on the sanitary sewer system. Since the inception of the City’s water metering program in 2003, the City’s total water use has decreased by 14% despite an increase in population of 32%. The City has made significant advances in water metering since the program was first introduced. Approximately 83% of the City’s water use is currently metered. Currently, all single-family and industrial, commercial and institutional properties are metered, and approximately 60% of multi-family units are metered.

Multi-Family Water Meter Program

Mandatory metering of new multi-family complexes began in 2005, and 395 complexes (22,143 dwelling units) have been metered under this program. Voluntary metering of existing multi-family complexes began in 2010. In 2017, Council endorsed an advanced voluntary multi-family water meter program to encourage a higher rate of adoption. Through these voluntary programs, 153 complexes (9,458 dwelling units) have been metered. The voluntary program was converted to a universal program in 2022 to accelerate the metering of multi-family complexes and further enhance water conservation in the City. Through the universal multi-family water meter program, 26 complexes (2,373 dwelling units) have been metered as of January 2024.

As part of the multi-family water meter program, staff have hosted several presentations and information sessions to engage residents. The program includes a five-year guarantee, which ensures that newly metered customers will not pay more than the flat rate for five years after the installation of a new water meter. This provides residents with the opportunity to fix potential leaks in private water systems and adjust consumption habits without the risk of incurring a higher utility fee.

To date, approximately 60% of multi-family dwellings have been metered through the voluntary and universal programs. Ninety-eight percent (98%) of these multi-family dwellings saved money in 2023, with an average saving of 48% as compared to the flat rate. Table 1 below summarizes the multi-family residential inventory and the associated water metering status as of January 2024.

Table 1. Multi-Family Inventory

Type	Number of Complexes	Number of Units	Number of Complexes Metered	Number of Units Metered	% of Units Metered
Townhouse	673	18,506	351	8,633	47%
Apartment	354	38,313	223	25,341	66%
Total	1,027	56,819	574	33,974	60%

Through the 2022 Utility Budgets and Rates Report, Council endorsed an annual capital funding amount of \$3M to support the multi-family water meter program. This funding level will permit the universal multi-family meter program to be largely accomplished by 2039. Additional funding required to support the universal multi-family metering may be requested as part of future budget processes.

Fixed Base Water Meter Readings

To enhance the collection of water consumption data from metered customers, Council endorsed the universal deployment of a fixed base water meter reading network through the 2017 capital budget process. The network facilitates automated data collection, reduces costs and carbon emissions associated with manually reading water meters, allows staff to gather real-time consumption data, assists customers in identifying water consumption habits, and enhances revenue forecasting to inform the utility budget process. The network deployment was completed in 2019, and optimization of the network was completed in 2022. The fixed base network covers the entire urban area in Richmond and is utilized for over 95% of Richmond’s water meter inventory.

With the deployment and optimization of the fixed base network, the City has achieved significant improvements in water conservation. This has allowed the City to reduce its Metro Vancouver water purchase costs by \$15M in 2023. These savings are a strong indication that the City’s water metering initiatives have significantly reduced water consumption, thereby improving water conservation.

Figures 1 and 2 show Richmond’s per capita water consumption since 2006.

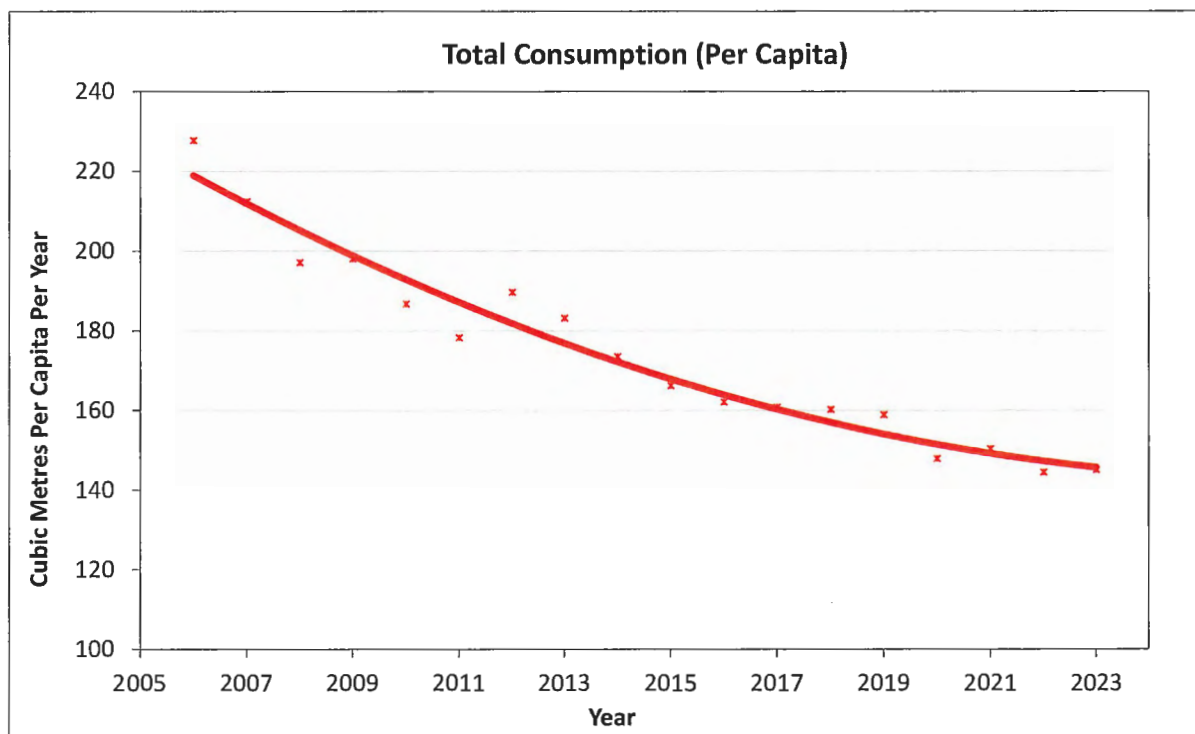


Figure 1: Total Consumption Per Capita

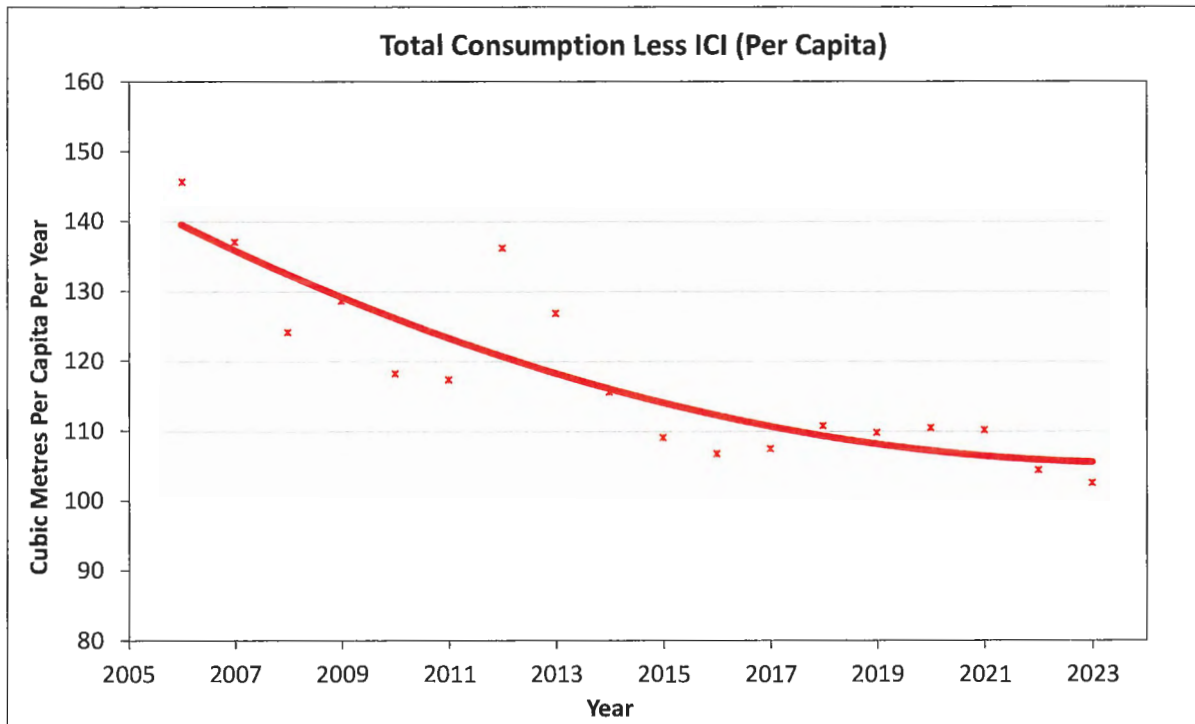


Figure 2: Total Consumption (Less Industrial, Commercial and Institutional) Per Capita

Water Pressure Management Program

To reduce water losses and extend the service life of the City’s water supply infrastructure, the City has implemented an innovative water pressure management program. Through this program, pressure reducing stations are used to adjust the City’s water supply in accordance with the daily and seasonal variations in water usage. Water pressure is typically maintained at higher levels during periods of high water demand (i.e., drier conditions during summer months), and adjusted to lower levels during periods of low water demand (i.e., during overnights and winter months). The program helps conserve water, reduce leakage, and protect water supply infrastructure from potential damage caused by excessive water pressure.

Leak Reduction and Detection Programs

The City’s leak reduction and detection programs help reduce water losses associated with leaks in private and City-owned water systems. The leak reduction program involves using the fixed base water meter reading system to detect properties with continuous water consumption. Staff review this data and educate property owners about their continuous water usage, which could indicate a leak in their private water system. Through this program, leaks can be detected earlier than when they become visible or obvious, thereby reducing unnecessary water losses in private water systems.

The leak detection program involves the use of noise loggers to measure sound frequencies in City-owned water infrastructure to identify non-visible leaks. This allows non-visible leaks to be heard and recorded, and infrastructure to be proactively repaired to prevent further water loss.

Water Use Restrictions

In 2011, Council adopted the Water Use Restriction Bylaw No. 7784 to regulate the use of lawn and vegetation watering during periods of high demand, water shortages and emergencies in accordance with Metro Vancouver's Drinking Water Conservation Plan. The bylaw outlines staged water restrictions that come into effect following Metro Vancouver's stage declaration. The bylaw also supports the strategies in Metro Vancouver's Drinking Water Management Plan to ensure that drinking water is used in a sustainable manner.

Since 2022, the City has participated in a summer support program to support Metro Vancouver's water use restrictions. Through this program, staff have prepared communications material, which includes information bulletins, website updates, and social media posts, to inform residents and businesses about the importance of water conservation during dry periods. Staff also maintain proactive communication with Metro Vancouver during the summer support program, and provide residents and businesses with advance notice as water restriction stage changes come into effect.

Toilet Rebate and Rain Barrel Programs

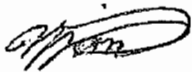
To further promote efficient water use, the City provides customers with water conservation kits that include low-flow showerheads, faucet aerators, toilet fill cycle diverters, toilet leak detection tablets, and educational water conservation tools. In addition, the City has a toilet rebate program that encourages residents to replace high-volume toilets with low-flush toilets, and a rain barrel program that encourages homeowners to collect and store rainwater for outdoor re-use. In 2023, the City provided 355 toilet rebates and 123 rain barrels to Richmond residents.

Financial Impact

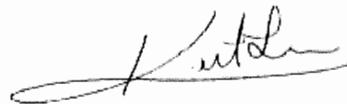
None at this time.

Conclusion

The City of Richmond continues to be a leader in water conservation initiatives through water metering, water pressure management, water use restrictions, leak reduction and detection, and toilet rebate and rain barrel programs. Staff will continue to advance these programs to further enhance water conservation in Richmond, and will provide updates to Council as required.



Manraj Gill, EIT
Senior Project Manager, Engineering Planning
(604-244-1281)



Keith Lam, P.Eng., PMP
Project Manager, Engineering Planning
(604-204-8516)

MG:kckl