To: Water Committee

From: Inder Singh, Director, Policy, Planning and Analysis, Water Services

Date: January 14, 2020

Meeting Date: February 13, 2020

Subject: Water Use by Sector in Metro Vancouver: 1985 – 2017

RECOMMENDATION
That the Water Committee receive for information the report dated January 14, 2020, titled “Water Use by Sector in Metro Vancouver: 1985 – 2017”.

EXECUTIVE SUMMARY
The “GVWD and Local Government Water Use by Sector Report 1985 – 2017” outlines the trends in water use by sector in the Metro Vancouver region. Data was compiled from metered end-user billing records provided by local governments receiving water from the GVWD and the resulting water use statistics provide valuable information for utility planning and the development of water conservation and efficiency programs. Historical water use patterns in the region can inform planning and implementation of GVWD and local government water management practices.

PURPOSE
To provide the Water Committee with information on water use trends and statistics, by sector, in the Metro Vancouver region.

BACKGROUND
A water supply and water consumption update report is provided each spring, followed by a summer water supply performance update in the fall. Water consumption data is also available from the “Water Consumption Statistics Report” and the “Peak Day Report”, which are published annually and posted on Metro Vancouver’s website.

As per the Committee’s 2020 Work Plan, this report is being brought forward to provide additional information on water use within the region based on water consumption data collected from local governments as well as GVWD billing data. The information within this report can be used to assist with regional and local government utility planning and facilitate the development and implementation of water conservation and efficiency programs.

This report includes statistics on water use by sector from the “GVWD and Local Government Water Use by Sector Report 1985 – 2017”, dated November 2019. The first edition of this report was compiled in 1997 and has since been updated on a regular basis, appending additional years of data to each new edition. This November 2019 report is the eighth update and includes data from 1985 to 2017.

The draft results from the Water Use by Sector Report were shared with members of the REAC Water Subcommittee and their comments were incorporated into the final document.
WATER USE BY SECTOR IN METRO VANCOUVER
The majority of drinking water in the region is supplied by the GVWD and originates from the Capilano, Seymour, and Coquitlam watersheds. GVWD water is treated and delivered to local governments, who in turn distribute water to individual residences and businesses. The Township of Langley, District of West Vancouver, and City of Delta have additional local water supplies, which made up approximately three percent of the total drinking water supplied in the Metro Vancouver region in 2017. Furthermore, approximately one percent of the region’s population within the Township of Langley, District of West Vancouver, District of North Vancouver and City of Maple Ridge are serviced by private water sources. The Water Use by Sector Report characterizes total water use from GVWD and municipal water sources and does not include statistics associated with private sources.

Data Analysis Methodology
Data for the Water Use by Sector Report was compiled from metered end-user billing records provided by local governments who receive water from the GVWD. In addition to individual consumption records, local governments were requested to provide the BC Assessment Authority Actual Use Codes (AUC) standard classification for each property account. AUCs classify each water connection based on building use and were used to classify water consumption by sector.

The Water Use by Sector Report groups AUCs into eight sectors:
1. Single-Family Residential
2. Multi-Family Residential
3. Commercial
4. Institutional
5. Industrial
6. Agricultural
7. Other
8. Unknown

The “Other” sector represents transportation, communications, utilities, and other accounts where an appropriate sector could not be determined. Beginning in 2013, water consumption data for accounts with no corresponding AUC provided were classified as “Unknown”.

All bulk water sold by the GVWD to its customers, predominately local governments, is metered. The annual difference between the total water billed by the GVWD and the metered water consumed by end-users on the municipal distribution systems is categorized as unmetered water consumption. The majority of unmetered municipal water consumption can be attributed to unmetered residential water consumption. Other components of unmetered water consumption include a small fraction of unmetered industrial, commercial, and institutional (ICI) water consumption, unmetered consumption at some municipal facilities and parks, and municipal system losses. Estimates for municipal system losses were self-reported by each local government and include distribution system leaks and water used for firefighting needs, water main flushing, and reservoir cleaning.

Trends in Water Use by Sector
For 2017, the total consumption of GVWD and local government supplied water was 398 billion litres, representing an average total water use of 486 litres per capita per day (L/capita/day). Per capita water consumption has steadily declined since 1985, keeping annual average water consumption relatively
steady despite a growing regional population. In more recent years, overall water use has been gradually increasing as the rate of population growth and associated water demand begins to exceed the per capita water use reductions. This emphasizes the need for continued effort on water conservation initiatives.

Figure 1 shows overall water use trends by sector in the region from 1985 to 2017. During the early years, starting in 1985, only a limited number of local governments were able to submit water consumption data and as such, data pre-1993 may not be representative of actual water use trends during those years. By 1994, the majority of the regional water consumption data was made available. In the past 15 years, there has been a gradual increase in the portion of water consumption associated with the metered single-family and multi-family residential sectors. The portion of metered ICI water use has remained relatively steady. Categorization of unmetered water consumption by sector is not possible.

Figure 1: Water Use by Sector Trends from 1985 to 2017

*Years when not all local government water consumption data was available; results may not be representative of actual water use trends during these years.

Figure 2 shows a breakdown of water use by sector in 2017. Using estimates of unmetered residential water use within each local government, residential water use per capita was determined to be approximately 263 L/capita/day, or 58 percent of the total water consumed in the region in 2017. As residential water metering increases in the region, more accurate estimates of residential water use, system losses within the region as well as specific water use trends within each sector can be determined.
Within the ICI sectors, the majority of the water consumption was associated with commercial use, followed by institutional and industrial use. Agricultural consumption accounted for a small percent of the total ICI water use. Industrial, commercial, institutional, and agricultural sectors accounted for approximately 5, 13, 5, and 2 percent of total water use, respectively.

**Figure 2: Breakdown of Water Use by Sector in 2017**

![Figure 2: Breakdown of Water Use by Sector in 2017](image)

Figure 3 illustrates a further breakdown of 2017 water use for the ICI sectors into twenty-one subcategories. Retail stores, businesses/offices and warehouses were among the top users of water within the ICI sectors.

**Figure 3: Metered ICI Water Use in 2017**

![Figure 3: Metered ICI Water Use in 2017](image)
ALTERNATIVES
This is an information report; no alternatives are presented.

FINANCIAL IMPLICATIONS
There are no financial implications associated with receipt of this report for information.

CONCLUSION
The “GVWD and Municipal Water Use by Sector Report 1985 – 2017”, dated November 2019 was developed in conjunction with local government staff and provides data on water use in the Metro Vancouver region.

During 2017, the total GVWD and local government supplied water consumed in the region was 398 billion litres, representing an average total water use of 484 litres per capita per day. Of the total water consumed in the region, the average residential use was approximately 263 litres per capita per day. Per capita water consumption has steadily declined since 1985, keeping annual average water consumption relatively steady despite a growing regional population. In more recent years, there are indications that per capita reductions are stabilizing, resulting in a gradual overall increase in annual water consumption emphasizing the need for continued effort on water conservation initiatives.

In 2017, it is estimated that the residential sector accounted for approximately 58 percent of the total water use in the region. Industrial, commercial, institutional, and agricultural sectors accounted for approximately 5, 13, 5, and 2 percent of total water use, respectively. Within non-residential sectors, retail stores, businesses/offices and warehouses were among the top end users of water in the region.

Water use by sector trends in the region provide valuable information for utility planning and the development of water conservation and efficiency programs. Historical water use patterns in the region can inform planning and implementation of GVWD and local government water management practices.