WATER USE EFFICIENCY PROGRAM

INTRODUCTION

The City of Snoqualmie (City) recognizes that water is a valuable and essential natural resource that needs to be used wisely. This Water Use Efficiency (WUE) program provides an approach to increase water use efficiency within the City's water service area.

BACKGROUND

The Water Use Efficiency Rule

In September 2003, the Washington State Legislature passed the Municipal Water Supply – Efficiency Requirements Act, also known as the Municipal Water Law. The Municipal Water Law required the state to implement the WUE Rule. The intent of this rule is to help reduce the demand that growing communities, agriculture, and industry have placed on our state's water resources, and to better manage these resources for fish and other wildlife. Municipal water suppliers are obligated under the WUE Rule to enhance the efficient use of water by the system and/or its consumers.

The WUE Rule applies to all municipal water suppliers and requires suppliers to:

- Develop WUE goals through a public process and report annually on their performance;
- Maintain distribution system leakage (DSL) at or below 10 percent of production;
- Meter all existing and new service connections;
- Collect production and consumption data, calculate DSL, and forecast demands;
- Evaluate WUE measures; and
- Implement a WUE program.

Water Use Efficiency Program Requirements

The *Water Use Efficiency Guidebook,* originally published by the Washington State Department of Health (DOH) in July 2007, and revised in January 2009, January 2011, and January 2017, identifies the water use reporting, forecasting, and efficiency program requirements for public water systems. A WUE program meeting these requirements is a necessary element of a Water System Plan as required by DOH and is necessary to obtain water right permits from the Washington State Department of Ecology (Ecology). The *Water Use Efficiency Guidebook* defines the necessary components of a WUE program as the following four fundamental elements.

1. Planning requirements that include collecting data, forecasting demand, evaluating WUE measures, calculating DSL, and implementing a WUE program to meet goals.
2. A DSL standard of 10 percent or less based on a 3-year rolling average. For systems with less than 500 connections, the DSL standard may be increased to 20 percent if a request with supporting data is provided to DOH.

3. Goal setting to provide a benchmark for achievement and to help define the success of the WUE program.
4. Annual performance reporting on progress towards meeting WUE goals.

WATER SUPPLY CHARACTERISTICS

Water in the City's system is currently only supplied by Snoqualmie-owned sources. Snoqualmie-owned sources include Canyon Springs, the South Wellfield (Well Nos. 1R and 2), and the North Wellfield (Well Nos. 6, 7, and 8). The South Wellfield has elevated raw water ammonia that can result in taste and odor issues; therefore, water is only supplied through this source when customer demand is high.

A summary of the Snoqualmie-owned sources is shown in **Table 1**, and a more detailed description of each source of supply is provided in **Chapter 2** of the City's Water System Plan (WSP).

Table 1

Supply Facilities Summary

Facility	Pressure Zone	Year Installed	Use	Existing Capacity (gpm)	Well Depth (feet)	Water Treatment
Canyon Springs	599 Zone	1950s	Active	898	N/A	Chlorination
North Wellfield[1]						
Well No. 6	705 Zone	1996	Active	550	589	Chlorination, Filtration (Iron, Manganese, and Arsenic Removal)
Well No. 7	705 Zone	1996	Active	550	541	Chlorination, Filtration (Iron, Manganese, and Arsenic Removal)
Well No. 8	705 Zone	2002	Active	1,250	694	Chlorination, Filtration (Iron, Manganese, and Arsenic Removal)
South Wellfield[2]						
Well No. 1-R	599 Zone	2006	Active	600	557	Chlorination, Filtration (Iron and Manganese Removal)
Well No. 2	599 Zone	2009	Active	600	564	Chlorination, Filtration (Iron and Manganese Removal)

1 = Well No. 6 cannot be run simultaneously with Well No. 8, so the maximum combined capacity of the North Wellfield is approximately 1,800 gpm.
2 = The capacity of the South Wellfield is currently limited to 563 gpm by the South Wellfield WTP.

The City currently holds one surface water certificate, three groundwater certificates, and one ground water permit for its sources of municipal supply. A summary of these water rights is

presented in **Table 2**. Additional water rights information for each source may be found in **Chapter 6** of the WSP, and on the certificates, permits, and water rights self-assessment that are included in **Appendix I**.

Table 2

Existing Water Rights

Water Right	Priority Date	Document	Source Name	Instantaneous Rate (gpm)		Annual Volume (afy)	
				Additive	Non-additive	Additive	Non-additive
GWC 91-D	1/1/1930	Superseding Certificate	North and South Wellfield	90	0	100	0
GWC 92-D	1/1/1940	Superseding Certificate	North and South Wellfield	90	0	100	0
G1-20316C	10/13/1972	Superseding Certificate	North and South Wellfield	600	0	0	500
G1-25449P	5/30/1989	Permit	North Wellfield	1,650	0	724	0
			Ground Water Subtotal	***2,430***	***0***	***924***	***500***
SWC 4553	10/18/1944	Certificate	Canyon Springs	898	0	1,448	0
			Total	**3,328**		**2,372**	

Notes:
A maximum of 2,430 gpm and 1,424 afy can be pumped from the North Wellfield.
A maximum of 600 gpm and 500 afy can be pumped from the South Wellfield.
G1-20316C annual volume is non-additive to the annual volume granted under GWC 91-D, GWC 92-D, and SWC 4553.
Instantaneous rate under SWC 4553 is equal to 2 cubic feet per second.
No annual volume specified under SWC 4553. Annual volume calculated here is equal to 898 gpm continuously, year round.
Development Schedule on G1-25449P requires full beneficial use by September 30, 2020.
Maximum of all rights is 3,328 gpm and 2,372 afy.

WATER USE EFFICIENCY PROGRAM

As previously described, the fundamental elements of a WUE program include planning requirements and DSL standards, as well as goal setting and performance reporting. The City's water use data, demand forecasts, and other planning requirements are contained in **Chapter 4** of the WSP. The City is committed to continue collecting water use data beyond that presented in **Chapter 4** for evaluation of its WUE program and water use patterns, and for forecasting demands for future facilities. The City's WUE program that follows includes a statement of its goals and objectives, the evaluation and selection of alternative efficiency measures, the schedule and budget, and the method of program monitoring.

Water Use Efficiency Goals and the Public Process

Per Washington Administrative Code (WAC) 246-290-830, WUE goals must be set through a public process and shall be evaluated and re-established as part of a WSP update. The City formally adopted water use efficiency goals in 2004 with the adoption of its WSP that year, and last updated its WUE Program as part of its 2013 WSP. The City has established new WUE goals for this update, building on the previous goals of reducing DSL and summer water use. The new WUE goals are as follows:

- Reduce the maximum day demand/average day demand (MDD/ADD) peaking factor to 2.5 by 2030.
- Maintain system-wide DSL at less than 6.0 percent per year based on a 3-year rolling average.

The City's highest annual MDD/ADD peaking factor of 2.68 was observed in 2016, as shown in **Table 3**. This peaking factor is above the typical range of 1.2 to 2.5 observed for most Puget Sound area systems. The City has established the goal of reducing the MDD/ADD peaking factor to 2.5 by 2030. Reducing the peaking factor will help mitigate the City's need to acquire additional water rights in the future and minimize the need to increase other aspects of system capacity.

Table 3

Demands and Peaking Factors

Year	Average Day Demand (gpm)	Maximum Day Demand (gpm)	Peak Hour Demand (gpm)	MDD/ADD Peaking Factor	PHD/MDD Peaking Factor
2015	988	2,241	4,214	2.27	***1.88***
2016	929	2,491	***4,495***	***2.68***	1.80
2017	1,068	***2,585***	4,284	2.42	1.66

As shown in **Table 4**, the system-wide DSL 3-year rolling average has been under 6 percent since 2015, well below the state DSL standard of 10 percent. The City's goal is to maintain the 3-year rolling average below 6 percent through 2030.

Table 4

Distribution System Leakage

	Year						
Description	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Metered Customer Use (MG)	360.7	459.9	464.5	490.9	519.4	471.2	551.3
Total Supply (MG)	442.1	472.2	506.3	536.0	519.2	489.4	561.6
Total DSL Volume (MG)	81.4	12.3	41.8	45.0	-0.2	18.2	10.3
Total DSL Percentage	18.4%	2.6%	8.3%	8.4%	0.0%	3.7%	1.8%
Rolling 3-Year Average DSL Percentage	---	---	9.8%	6.4%	5.5%	4.0%	1.8%

In compliance with the WUE Rule, a public hearing was held on July 26, 2021 at a City Council meeting to present and discuss the new goals. The City Council adopted the new goals on September 9, 2021.

Evaluation and Selection of Water Use Efficiency Measures

The City's evaluation of WUE measures and selected levels of implementation are presented within this section. The measures fall within three categories of implementation: 1) mandatory measures that must be implemented; 2) measures that must be evaluated; and 3) additional measures selected by the City that must be either evaluated or implemented.

The City served an average of 4,911 water service connections in 2017. Based on the number of connections, at least six WUE supplemental measures must be evaluated or implemented. Measures that are mandatory cannot be credited towards the system's WUE measures. Since the City implements the minimum number of required measures, a cost-effective evaluation is not required.

Mandatory Measures

Source Meters

The volume of water produced by the system's sources must be measured using a source meter or other meter installed upstream of the distribution system. Source meters are currently installed and operating at each of the City's sources. If any new sources are installed in the future, they will be equipped with a source meter.

Service Meters

All public water systems that supply water for municipal purposes must install individual service meters for all water users. Service meters are currently installed and operating at all connections throughout the distribution system. All future connections that are installed or activated will be equipped with a service meter.

Meter Calibration

The City must calibrate and maintain meters based on generally accepted industry standards and manufacturer information. Currently, the City evaluates and calibrates source meters every 2 years. The City began a customer meter replacement program in 1999. Customer meters are inspected regularly and replaced as necessary. Damaged or suspect meters are replaced as soon as they are discovered.

Water Loss Control Action Plan

To control leakage, systems that do not meet the state DSL standard of 10 percent must implement a Water Loss Control Action Plan (WLCAP). The City's rolling 3-year average DSL has been less than 10 percent for the past 5 years based on the information presented in **Table 4** and **Chapter 4** of the WSP. Therefore, a WLCAP is not required to be implemented.

Customer Education

Annual customer education regarding the importance of using water efficiently is a required element of all WUE programs. The City intends to provide water conservation tips along with the Consumer Confidence Report (CCR), on the City's website, and at City Hall. These materials include lawn watering and indoor conservation tips. Additional customer education and outreach measures are identified in the **Selected Supplemental Measures** section.

Measures that Must be Evaluated

Rate Structure

A rate structure that encourages WUE and provides economic incentives to conserve water must be evaluated but is not required to be implemented. The City's current utility rates are designed to discourage excessive water use. A base water rate is charged, depending on the meter size, regardless of consumption. An increasing block rate structure imposes a unit charge for water use that increases as the volume of water consumed increases.

Reclamation Opportunities

Revised Code of Washington (RCW) 90.46.010 defines reclaimed water as "water derived in any part from wastewater with a domestic wastewater component that has been adequately and reliably treated, so that it can be used for beneficial purposes." Water systems with 1,000 or more connections must evaluate reclamation opportunities (WAC 246-290-100(4)(f)(vii)), but only actual use of reclaimed water counts as a WUE measure (WAC (246-290-810(4)(d)) or multiple WUE measures if the reclaimed water is used for multiple purposes.

The City produces Class A reclaimed water at its Water Reclamation Facility (WRF). The reclaimed water is used for golf course irrigation and municipal irrigation purposes in the Snoqualmie Ridge area. The reclaimed water irrigation system is operated by a program called Maxicom, which computes the evapotranspiration rate on a daily basis and schedules irrigation in an efficient manner. This method of irrigation reduces the amount of water used for irrigation purposes.

Use of reclaimed water by the City's Irrigation and Public customer classes counts as two supplemental WUE measures.

Selected Supplemental Measures

The City has chosen to implement four different supplemental WUE measures in addition to those that are mandatory or required to be evaluated. Because several of these WUE measures affect multiple customer classes (detailed below), the City's WUE program counts as 16 WUE measures, which is greater than the requirement of 6 WUE measures based on the number of service connections.

Water Bill Showing Consumption History

The City is committed to including consumption history on all bills to its customers. The City's billing software, Springbrook, has the capability to include historic graphs on bills, and the City shows consumption history for all six of the City's customer classes. This counts as six supplemental WUE measures.

Notifying Customers about Leaks on Their Property

The City's billing department monitors customers' water bills for abnormally high water reads. When a significantly high read occurs that is outside the range of normal use, the customer is notified of a potential leak on their side of the water meter. The City provides this information to all six customer classes; thus, it counts as six supplemental WUE measures.

Snoqualmie Ridge (SR) I and II Irrigation Analysis and Water Audit

The City has conducted a thorough and exhaustive inventory and analysis of the irrigation systems within the Snoqualmie Ridge area. The City has identified all areas irrigated by either potable or reclaimed water and verified all meter data and account information to ensure all irrigated water is being properly accounted for and billed. The City now monitors monthly irrigation data for all services to help determine if additional conservation measures are needed

to curtail water use. This WUE measure applies to the City's Irrigation customer class; therefore, it counts as one supplemental WUE measure.

Purveyor Assistance

The City provides wholesale water to the Walter Walker Water Works system. The Walter Walker system includes approximately 14 homes. Conservation and efficient water use efforts made by the City intended for residential customers will be extended to the homes in the Walter Walker system as well. Because the Walter Walker system is included in the City's Residential customer class, this counts as one supplemental WUE measure.

Water Use Efficiency Program Schedule and Budget

The WUE measures described above and selected for implementation by the City are summarized in **Table 5** with their corresponding schedule and budget. The successful implementation of this program is expected to achieve the City's WUE goals.

Table 5

WUE Program Schedule and Budget

Mandatory WUE Measures		
Measure	**Schedule**	**Budget**
Source Meters Installed	Ongoing	O&M Funded
Service Meters Installed	Ongoing	O&M Funded
Meter Calibration Compliance	Ongoing	O&M Funded
Customer Education	Ongoing	O&M Funded
WUE Measures That Must Be Evaluated		
Measure	**Schedule**	**Budget**
Rate Structure	Ongoing	Not Applicable
Reclamation Opportunities	Ongoing	Not Applicable
Selected WUE Measures		
Measure	**Schedule**	**Budget**
Water Bill Showing Consumption History	Ongoing	Not Applicable
Notifying Customers About Leaks	Ongoing	O&M Funded
SR I and II Irrigation Analysis and Water Audit	Ongoing	O&M Funded
Purveyor Assistance	Ongoing	Not Applicable

O&M = Operations and Maintenance

Water Use Efficiency Program Evaluation and Reporting

The City will continue to evaluate overall demand, per capita and per equivalent residential unit water use, peaking factors, and the amount of DSL on an annual basis. The City will evaluate the performance of its WUE program and implemented measures by analyzing demand data and determining the long-term trend towards reducing water usage and meeting WUE goals. If the program monitoring shows that progress towards meeting the WUE goals is not being

accomplished, more rigorous program implementation or additional program items will be considered, along with a cost-effective evaluation of measures.

The City will provide annual WUE performance reports to its consumers in the CCR and will detail the results of water use monitoring and progress towards achieving the system's WUE goals. A copy of the City's current CCR is included in **Appendix L** of the City's WSP.