

Water Use Efficiency Program

INTRODUCTION

The Town of Eatonville (Town) 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 Town'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 requires the state to implement the Water Use Efficiency Rule. The intent of this rule is to help reduce the demand that growing communities, agriculture, and industry have placed on the 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 requirements of the WUE Rule are set forth in Chapter 246-290 of the Washington Administrative Code (WAC), Part 8.

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;
- Meet distribution system leakage standards based on a 3-year rolling average at or below 10 percent of production;
- Meter all existing and new service connections;
- Collect production and consumption data, calculate distribution system leakage, 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 2011, 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 the DOH and is necessary to obtain water right permits from the Washington State Department of Ecology

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(Ecology). The *Water Use Efficiency Guidebook* defines the necessary components of a WUE program as the following three fundamental elements.

1. Planning requirements that include collecting data, forecasting demand, evaluating WUE measures, calculating distribution system leakage, and implementing a WUE program to meet goals.
2. A distribution system leakage (DSL) standard of 10 percent or less based on a 3-year rolling average.
3. Goal setting to provide a benchmark for achievement and to help define the success of the WUE program, as well as annual performance reporting on progress towards meeting WUE goals.

WATER SUPPLY CHARACTERISTICS

Water supply to the Town’s water system is provided by the Mashel River and four wells adjacent to the river. The wells draw from an unconfined aquifer and are considered a well field under the direct influence of surface water. A summary of the sources is shown in **Table 1**, and a more detailed description of each source of supply is provided in **Chapter 2** of the Town’s 2012 Comprehensive Water System Plan (WSP).

Table 1
Supply Facilities Summary

Source	Pressure Zone	Year Drilled	Existing Capacity (gpm)	Well Depth (feet)	Well Diameter (inches)	Pump Type	Pump Motor Size (hp)	Water Treatment ¹	Control Facility
Mashel River	996 Zone	n/a	400	n/a	n/a	n/a	n/a	MF/Cl ₂ /NaOH	Clear Wells
Well No. 1	996 Zone	1966	210	43	12	Submersible	5	MF/Cl ₂ /NaOH	Clear Wells
Well No. 2	996 Zone	1969	220	44	10	Submersible	5	MF/Cl ₂ /NaOH	Clear Wells
Well No. 6	996 Zone	2004	200	73.5	12	Submersible	7.5	MF/Cl ₂ /NaOH	Clear Wells
Well No. 7	996 Zone	2004	325	99	12	Submersible	15	MF/Cl ₂ /NaOH	Clear Wells

¹ = MF: membrane filtration; Cl₂: chlorination; NaOH: caustic soda for pH

The Town currently holds several water right permits and certificates for the supply facilities shown in **Table 1**. A summary of these water rights is presented in **Table 2**. The Town has acquired water right certificates for all of the sources shown in **Table 1**. Additional water rights information for each source may be found in **Chapter 6** of the WSP, as well as on the certificates, permits, and water rights self assessment, which are included in **Appendix J** and **Appendix P** of the WSP.

**Table 2
Existing Water Rights**

DOH No.	Source Name	Permit or Certificate Number	Priority Date	Primary or Supplemental Right	Existing Water Rights			
					Instantaneous		Annual	
					(gpm)	(cfs)	(acre-ft)	(gpm)
S05	Mashel River	10307 and S2-004455CL	8/18/1967 6/1908	Both No	1,032	2.3	525	325
S06	Well Nos. 1, 2, 6 & 7	5676-A	11/29/1966	Both	360	0.8	394	244
S06	Well Nos. 1, 2, 6 & 7	G2-01087C	8/18/1967	Supplemental	250	0.6	400	247
Totals					1,642	3.7	525	325

The Mashel River is within the Nisqually River Basin, which is Water Resources Inventory Area (WRIA) 11. Water use within this basin is regulated by Ecology. In 1981, Ecology adopted an administrative rule titled, “Instream Resources Protection Program – Nisqually River Basin, Water Resource Inventory Area 11”, which is Chapter 173-511 WAC. This rule established minimum instream flows at specific control stations on the larger rivers in the basin. The minimum instream flows are in effect a non-consumptive water right held by the state, on behalf of the public, for maintaining water in a river for in-stream uses of water. The priority date of these minimum instream flow rights is the date the rule specifying them was adopted (February 2, 1981, for Chapter 173-511 WAC). Since the Town’s existing water rights were issued prior to the adoption of the instream flow rule, which means the Town’s rights are senior, they are not subject to these minimum instream flows. However, if the Town decides to apply for a new water right for additional water supply, that water right would be younger (junior) than the minimum instream flow rule and would therefore be subject to the rule. Being subject to a minimum instream flow means that a water right holder cannot reduce the flow of the river when the minimum instream flows are not being met. For a surface water diversion or groundwater in direct hydraulic continuity with the river, water could only be captured when the actual flow in the river exceeds the minimum instream flows set in the rule for that particular day.

The sources of supply are not located in any of the 16 fish-critical basins established by Ecology. The Nisqually Chinook Recovery Plan has identified restoration and protection projects for the Mashel River to improve habitat conditions for Chinook salmon, a species designated under the Endangered Species Act as Threatened in the Nisqually basin. The Phase IV Nisqually Implementation Plan for Watershed Management in WRIA 11 recommends surface water augmentation to increase instream flows in the Mashel River for fish habitat. The Town is currently preparing an Alternative Water Source Investigation that includes analyses regarding altering the use of current supply sources to increase instream flow in accordance with the watershed management goals.

Environmental factors such as drought or climate change are likely to affect recharge to the sources since flow in the Mashel River is predominately rainfall dependent. Levels in the Mashel River are highest in the winter months and lowest in the summer months. The Town must rely on both the wells and river source in the summer months to meet peak demands. The river source is rarely used at other times of the year due to high turbidity and the increased levels of treatment required.

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 Town's water use data, demand forecasts and other planning requirements are contained in **Chapter 4** of the WSP. The Town 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 Town'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 WAC 246-290-830, WUE goals must be set through a public process and must be evaluated and reestablished a minimum of every 6 years. In compliance with the WUE Rule, a public hearing was held during the summer of 2009 to present and discuss the Town's initial goals. The initial WUE goals included reducing overall water demand and reducing the distribution system leakage to 10 percent or less. As is evident in **Chapter 5** of the WSP, the Town successfully reduced the overall water system demand from 132 gallons per capita per day in 2009 to 120 gallons per capita per day in 2011. The Town achieved an overall water savings of approximately 8.8 million gallons of water over the previous 2 years when most of the water savings for the 6-year planning period was realized. The goal of reducing the distributions system leakage to 10 percent or less has not been achieved since the goal was established.

New goals have been proposed based on the demand analysis and projections presented in the Town's WSP. The proposed goals and objectives of the Town's WUE program consist of:

- Reducing the four-year rolling average per capita demands by 6 percent by 2018, and by 8 percent by 2032; and
- Reducing DSL to 10 percent or less by 2015.

As a part of the water system planning process, a public hearing was held on December 10, 2012, to present and discuss the newly established proposed goals. Background information on the Town's proposed WUE program, water supply characteristics, water demand forecasts, and other elements were made available 2 weeks prior to the public forum date. All comments received at the forum were reviewed and considered by the Town. It is anticipated that the proposed goals will be adopted, along with the WSP, at a regularly scheduled Town Council meeting. In the future, WUE goals will be evaluated and reestablished during the water system planning process, or at minimum of every 6 years.

The Town will achieve these goals and objectives through the implementation of the WUE program that follows. Reducing DSL is a supply side goal that can be achieved through measures that will mainly be carried out by the Town's Water Department, or in coordination with other Town departments. Reducing the demand per capita is a demand side goal that can be achieved through carrying out measures that affect customers' water use.

Evaluation and Selection of Water Use Efficiency Measures

The Town'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 Town that must be either evaluated or implemented.

The Town served 1,036 water service connections in 2011. Based on the number of connections, at least five WUE measures must be evaluated or implemented. Measures that are mandatory cannot be credited towards the system's WUE measures. Since the Town 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 Town'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 Town must calibrate and maintain meters based on generally accepted industry standards and manufacturer information. Compliance will be maintained by the Town by performing maintenance on the source and service meters every 5 to 10 years at a minimum. Meter calibration is performed on an as-needed basis, typically when meter readings are inconsistent with customer consumption history.

Water Loss Control Action Plan

To control leakage, systems that do not meet the DSL standard must implement a Water Loss Control Action Plan (WLCAP). The Town's rolling 3-year average DSL was 16 percent in 2011; therefore a WLCAP is required. The Town has set a goal to reach a DSL of 10 percent or less by 2015. The Town has periodically seen DSL at 10 percent or less when active leak detection and repair is in progress. The Town plans to pursue an aggressive system-wide leak detection and repair program to meet its goal. Leak detection will be performed by professional contractors and the

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Town's employees and repair of the leaking water mains will be completed as soon as possible. Further training of water and fire department employees will also be done to ensure the Town's personnel are properly trained regarding complete closure of older fire hydrants. The Town will continue to look for unauthorized water users and to ensure that water sales are recorded in the proper units. The Town takes the DSL issue very seriously and plans to utilize available resources to reduce the DSL percentage.

Customer Education

Annual customer education regarding the importance of using water efficiently is a required element of all WUE programs. Customer education is provided in the Town's annual Consumer Confidence Report (CCR) to customers and includes information on the system's DSL and progress towards meeting WUE goals. A copy of the Town's 2011 CCR is located in **Appendix M** of the WSP.

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 Town's current utility rates are designed to discourage excessive water use. New water rates were evaluated in the Town's 2005 Rate Study. The Town implemented a two-tiered inclining block rate structure to encourage WUE. For $\frac{3}{4}$ -inch meters serving single-family residences, the inclining block rate structure imposes a charge of \$0.34 for every hundred gallons over 15,000 gallons. This is an increase from the base amount of \$0.24 charged per hundred gallons for 0 to 15,000 gallons. The usage rates are in addition to the single-family base rate of \$28.00. Future rate studies will consider a more aggressive inclined block rate structure and an evaluation of seasonal rates to reduce peak summer water use.

Reclamation Opportunities

The Town has evaluated reclamation opportunities, but has determined that reuse opportunities are currently not feasible. The Town has installed purple pipe, which is pipe typically used for reclaimed water, at various locations throughout the Town, but the network is incomplete. Furthermore, the existing wastewater treatment plant does not have the ability to treat wastewater to an acceptable standard for reclaimed purposes. Significant upgrades to the wastewater treatment plant and the installation of substantial lengths of purple pipe would be necessary to provide reclaimed water to customers.

If the wastewater treatment facility was upgraded to treat wastewater to an acceptable standard, the Town would need to obtain a reclaimed water use permit to put reclaimed water to a beneficial use. One of the most difficult hurdles to obtaining a reclaimed water use permit is the water right impairment analysis. Under this analysis, the impact of reducing the amount of wastewater discharge is viewed similarly to a new consumptive water right from the Mashel River and the reclaimed water permit can only be granted if there is no impairment of any other water right holder, including minimum instream flows. The potential for not meeting instream flows throughout the year exists for the Mashel River, and closing the river from June 1 to October 31 would prevent reclaimed water from being used during this period. Unfortunately, this is the same period when the Town would logically be looking for reclaimed water supply to offset or cover irrigation demand, which

accounted for approximately 10 percent of the Town's billed consumption in 2011. Outside of the summer months, when the reclaimed water could be stored or utilized, there is likely minimal demand for a water supply that cannot be put to potable uses.

Due to the difficulty associated with obtaining a reclaimed water use permit for summer water use and the high cost of upgrading the wastewater treatment plant and purple pipe network, additional reclamation opportunity investigations will not be completed by the Town at this time.

Selected Measures

The Town has chosen to implement four different WUE measures in addition to those that are mandatory or required to be evaluated. Each of the chosen measures will be implemented for the two primary customer classes (i.e., the single-family class and the multi-family/commercial/school class). The Town's WUE program, therefore, counts as eight WUE measures, which exceeds the requirement of five WUE measures based on the number of service connections.

Conservation Rate Structures

Evaluating rate structures to increase water demand efficiency is required per WAC 246-290-100(4)(j)(iv), but actually implementing of a conservation rate structure counts as a WUE measure per WAC 246-290-810(4)(d). The Town is implementing an inclining block rate structure for its customers. Since this measure is implemented for all customer classes, it counts as two WUE measures for the Town's program.

Notifying Customers About Leaks on Their Property

Notifying customers of unusually high water bills potentially caused by a leak on the customer's property counts as a WUE measure per WAC 246-290-810(4)(f). When the Town's meter reader notices an unusually high meter reading, the Town contacts the property owner and advises the customer to search for leaks. Since the Town notifies customers in all customer classes of unusual high meter readings, it counts as two WUE measures for the Town's program.

Customer Education

Customer education that is carried out more than once a year counts towards meeting the program requirements for WUE measures. The Town will provide periodic customer education, in addition to the annual CCR, by periodically posting water tips on the Town's Facebook page. Since this measure is being implemented for all customer classes, it counts as two WUE measures for the Town's program.

Water Bill Showing Consumption History

The Town will continue to provide all of their customers with consumption history and will include conservation messaging on water bills. If implemented, this will count as two additional WUE measures for the Town's program.

Water Use Efficiency Program Schedule and Budget

The WUE measures described in the previous section and selected for implementation by the Town are summarized in **Table 3** with their corresponding schedule and budget. The successful implementation of this program is expected to achieve a 6 percent per capita water use reduction by the year 2018 and an 8 percent per capita water use reduction by the year 2032, as shown in **Chart 1**.

**Table 3
WUE Program Schedule and Budget**

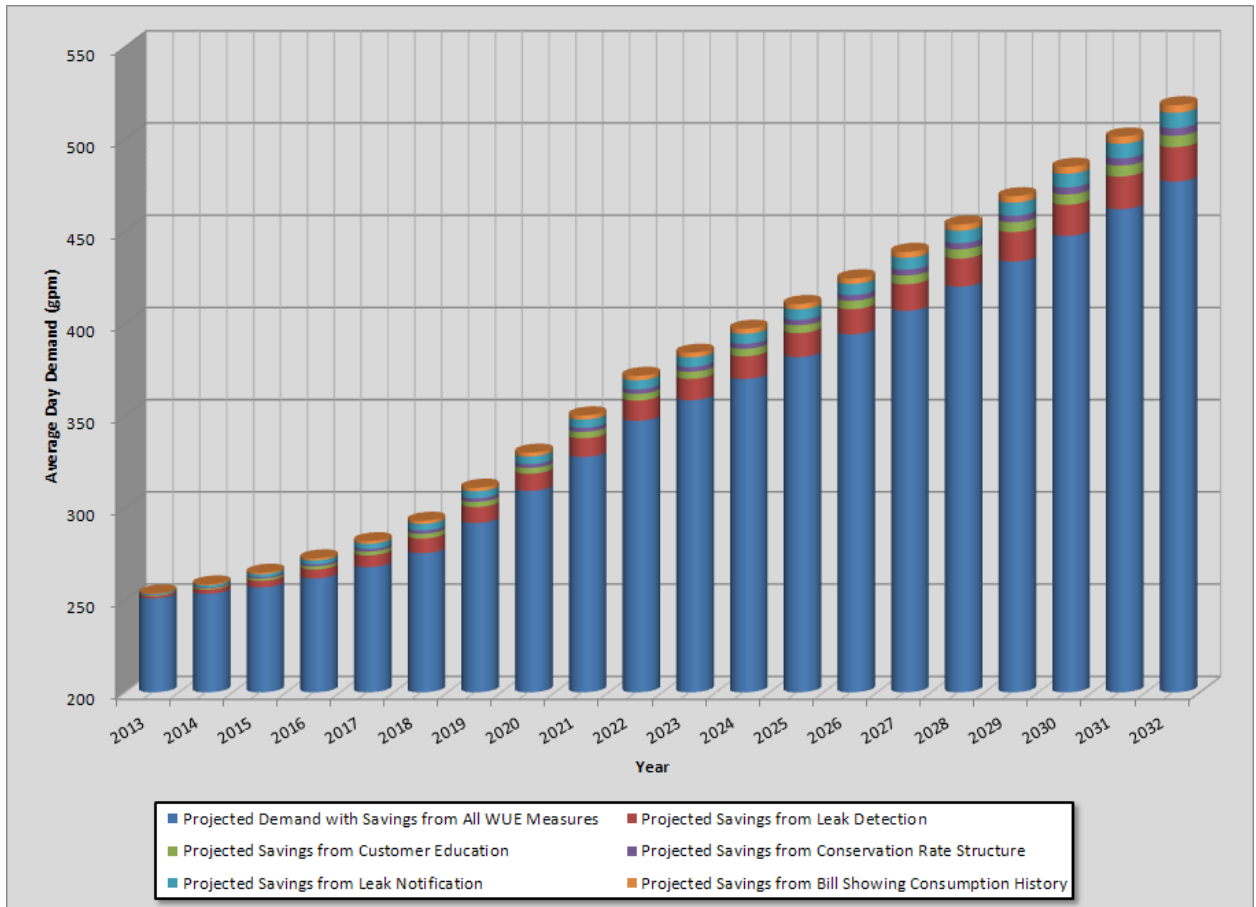
Water Use Efficiency Measure	Schedule	Budget
Mandatory Measures		
Source Meters	Ongoing	O&M Funded
Service Meters	Ongoing	O&M Funded
Meter Calibration	Ongoing	O&M Funded
Water Loss Control Action Plan/Leak Detection ¹	Ongoing	\$1,000/yr
Customer Education - Annual Consumer Confidence Report	Ongoing	\$1,000/yr
Measures That Must be Evaluated		
Rate Structure ²	2016	\$40,000
Selected Measures		
Notifying Customers About Leaks on Their Property	Ongoing	O&M Funded
Customer Education - Facebook Tips	Ongoing	O&M Funded
Water Bill Showing Consumption History	Ongoing	O&M Funded
<p>1 = When the Town's budget allows, additional resources will be utilized for leak detection. 2 = Rate structure budget reflects estimated water rate study cost.</p>		

Water Use Efficiency Program Evaluation and Reporting

The Town will continue to evaluate overall demand, per capita and per ERU water use, and the amount of DSL on an annual basis. The Town 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 per capita 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 Town will continue to 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 Town's 2011 CCR is included in **Appendix M** of the Town's WSP.

**Chart 1
WUE Program Projected Water Savings**



PRELIMINARY