

Water Use Efficiency Program

INTRODUCTION

The City of Stanwood (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 at or below 10 percent of production;
- Meter all existing and new service connections;
- Collect production and consumption data, calculate distribution system leakage (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 and 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 (Ecology). The *Water Use Efficiency Guidebook* defines the necessary components of a WUE program as the following four fundamental elements.

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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 the 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

All water supply to the City’s water system is provided by a few groundwater wells in the East Stanwood Aquifer and one groundwater spring source. The City’s oldest source of supply, the Hatt Slough Springs, is located south of the City limits on the south side of the Hatt Slough and is currently offline due to a November 2011 landslide restricting access to the site. Bryant Well No. 1 is the City’s largest single source of supply and is located near State Route (SR) 532 and 268th Street NW. Bryant Well No. 2, which is located adjacent to Bryant Well No. 1, is offline due to a decline in capacity and is considered an emergency source of supply. An emergency source is a source of supply that DOH has approved for use, but is not utilized for routine or seasonal demands. A replacement, Bryant Well No. 3, was drilled in 2013 and is planned for connection to the water system in 2015. The Cedarhome Well was installed in 2008 to replace the Sill Well, which has been offline since 1985 and is disconnected from the water system. The Fure Well, which is located on the eastern edge of the City limits, is out of service and is considered an emergency source. A summary of the well 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 *Comprehensive Water System Plan (WSP)*.

**Table 1
Supply Facilities Summary**

Well	Pressure Zone	Year Drilled	Use	Existing Pumping Capacity (gpm)	Well Depth (feet)	Well Diameter (inches)	Pump Type	Pump Motor Size (hp)	Water Treatment ²	Control Facility
Hatt Slough Springs	125 Zone	1934	Temporarily Offline	260	n/a	n/a	Centrifugal	10	Cl ₂	Continuous
Bryant Well No. 1	297 Zone	1948	Active	1,350	250	12	Turbine	75	Cl ₂ /Mn/H ₂ S/As	Knittle Tanks
Fure Well	297 Zone	1951	Emergency	100	157	12	n/a	n/a	n/a	n/a
Bryant Well No. 2	297 Zone	1966	Emergency	0	200	12	n/a	n/a	n/a	n/a
Cedarhome Well	297 Zone	2008	Active	600	490	12 & 16	Turbine	100	Cl ₂	Knittle Tanks
Bryant Well No. 3 ¹	297 Zone	2013	In Design	0	275	16	n/a	n/a	Cl ₂ /Mn/H ₂ S/As	Knittle Tanks

1 = Bryant Well No. 3 has been drilled and is expected to have a capacity of 1,000 gpm when completed.
2 = Cl₂: chlorination; Mn: manganese filtration; H₂S: hydrogen sulfide removal; As: arsenic removal.

Water Use Efficiency Program

The City currently holds one water right permit and three water right certificates for the supply facilities shown in **Table 1**. 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, which are included in **Appendix I**.

**Table 2
Existing Water Rights**

DOH No.	Source Name	WRTS Record Number	Certificate/Permit Number	Priority Date	Primary or Supplemental Right	Use	Existing Water Rights			
							Instantaneous		Annual	
							(gpm)	(cfs)	(acre-ft)	(gpm)
S01	Hatt Slough Springs	S1-*02432CWRIS	SWC 1164	9/28/1928	Primary	Permanent	1,122	2.5	1,810	1,122
S02	Bryant No. 1 ¹	G1-*00741CWRIS	GWC 615	2/20/1948	Primary	Permanent	2,000	4.5	2,400	1,487
S03	Bryant No. 2 ¹	G1-*00741CWRIS	GWC 615	2/20/1948	NA ¹	Emergency	2,000	4.5	2,400	1,487
NA ²	Bryant No. 3 ¹	G1-*00741CWRIS	GWC 615	2/20/1948	NA ¹	Permanent ²	2,000	4.5	2,400	1,487
S04	Fure Well	G1-*01067CWRIS	GWC 616	2/11/1949	Primary	Emergency	150	0.3	121	75
S07	Cedarhome Well ³	G1-*04239	Superseding GWP 4111	3/6/1956	Primary	Permanent	600	1.3	960	595
Water Right Total							3,872	8.6	5,291	3,279

¹ = Bryant Well Nos. 1, 2, and 3 are authorized under the same water right. Quantities shown are for the entire right, not each individual well.
² = Source approval not yet obtained
³ = Transferred from the Sill Well
 DOH No. = Source Number
 WRTS = Water Right Tracking System (Department of Ecology)
 SWC = Surface Water Certificate
 GWC = Groundwater Certificate
 GWP = Groundwater Permit
 gpm = gallons per minute
 cfs = cubic feet per second
 acre-ft = acre-feet per year

Sources of water derive from recharge of precipitation into aquifers that discharge to City-owned wells and springs. The groundwater recharge does not appear to be restricted by growth in the aquifer recharge areas for these sources. Groundwater recharge to the City's sources of supply occurs within the Stillaguamish River watershed (Water Resources Inventory Area (WRIA) 5) and these sources are beneficially used within WRIA 5.

The sources of supply are not located in any of the 16 fish-critical basins established by Ecology. The City water rights are senior to instream flow rule and not subject to limitation by stream flow in the Stillaguamish River or its tributaries. The Stillaguamish River Watershed Chinook Salmon Recovery Plan has identified increasing stream flow as a goal to improve habitat conditions for Chinook salmon, a species designated under the Endangered Species Act as Threatened in the Stillaguamish basin. However, stream flow in the tidally influenced portion of the Stillaguamish River is not considered a limiting factor in salmon recovery planning.

Environmental factors such as drought and climate change could have a negative effect on recharge to the aquifers. Groundwater level in the aquifer tapped by the Bryant Wells has not yet reached dynamic equilibrium with the rate of water being removed from the aquifer through pumping by the City. This has caused the groundwater level to drop from year to year. Groundwater levels in the aquifer tapped by the Cedarhome Well fluctuates seasonally, but does not show a declining trend.

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 reestablished a minimum of every 6 years. In compliance with the new WUE Rule, a public hearing was held on July 29, 2010, to present and discuss goals. Background on the City's 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 City. The City's current WUE goals were adopted by the City on July 29, 2010. In the future, WUE goals will be evaluated and reestablished during the water system planning process, or at minimum of every 6 years.

Based on the successful implementation of the current WUE program, the City has achieved one of the goals adopted in 2010 ahead of schedule. The 2010 goal was to reduce the 4-year rolling average demand per equivalent residential unit (ERU) to 201 gallons per day (gpd) by 2019 and 195 gpd by 2029. The 4-year rolling average demand per ERU in 2013 was 192 gpd, which is well below the 2029 goal. The City continues to strive to meet the other goal, which is to achieve 10 percent or less DSL. New goals have been proposed based on the demand analysis and projections presented in the City's updated WSP. It is anticipated that the proposed goals will be adopted along with the WSP at a regularly scheduled City Council meeting. Prior to adoption of the goals, a public notice will be posted at least 2 weeks before a City Council meeting public forum for presenting and considering public comments.

The proposed goals and objectives of the City's WUE program consist of:

- Reduce the 4-year rolling average demand per equivalent residential unit (ERU) to 185 gpd by 2035; and
- Improve distribution system leakage to 10 percent or less by 2035.

The City 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 City's Water Department or in coordination with other City departments. Reducing the demand per ERU 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 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 2,554 water service connections in 2013. Based on the number of connections, at least six WUE 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. Compliance will be maintained by the City 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 City's rolling 3-year average DSL was 14.0 percent in 2013 and total distribution system leakage in 2013 alone was 13.6 percent. The City has improved recordkeeping for authorized water consumption uses such as construction, flushing, and fire fighting activities to reduce the amount of DSL in the system. The City conducted a system-wide leak detection survey in 2013. Leaks were detected on nine fire hydrants and six water mains and service lines. All detected leaks were repaired. It is anticipated that the 2013 DSL of 13.6 percent can

be reduced through accurate record keeping practices, leak detection tests, and the completion of future water main capital improvement plan (CIP) projects.

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 City's annual Consumer Confidence Report (CCR) to customers and includes information on the system's DSL, progress towards meeting WUE goals, and tips for customers on using water more efficiently.

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. The uniform block rate structure imposes a unit charge for water use above the base amount allowed for each meter size. For ¾-inch meters that typically serve single family residences, customers that use more than 600 cubic feet in one billing cycle are billed an additional \$2.89 for every 100 cubic feet of water consumed in excess of 600 cubic feet.

The City considered alternative rate structures in a 2010 rate study, but a modified rate structure was not selected. Future water rate studies will evaluate an inclining block rate structure that imposes an increased unit charge with higher water use above the base amount allowed. Rate studies will also evaluate seasonal rates to reduce peak summer water use.

Reclamation Opportunities

The City has evaluated reclamation opportunities but has determined that reuse opportunities will not be beneficial because the cost to construct improvements to the existing wastewater treatment plant and separate conveyance systems is much more than the financial savings resulting from the potential water savings.

The City's wastewater treatment plant does not treat wastewater to a level that can be used for reclaimed purposes. Significant upgrades to the wastewater treatment plant and the installation of purple pipe would be necessary to provide reclaimed water to customers. The City's highest water users consist of businesses such as food processing and packing plants, a nursing facility, and a grocery store that rely on potable water and likely would not purchase reclaimed water. Customers that could utilize reclaimed water include large irrigators such as parks, schools, and cemeteries. A car wash facility is also located near the wastewater treatment plant and could utilize reclaimed water if available.

The City's 2014/2015 *Comprehensive Sewer System Plan* recommends a plan to evaluate the capacity of the wastewater treatment plant in 2021 with upgrades scheduled for 2029 through 2031. The study will consider improvements to enable the wastewater treatment plant to produce reclaimed water when the treatment capacity is expanded.

Selected Measures

The City has chosen to implement two different WUE measures in addition to those that are mandatory or required to be evaluated. Each of the chosen measures will be implemented for all three customer classes. The City's WUE program, therefore, counts as six WUE measures, which is equivalent to the requirement of six WUE measures based on the number of service connections.

Water Bill Showing Consumption History

The City currently shows consumption history charts and information on water bills. Since this measure is implemented for all customer classes, it counts as three WUE measures for the City'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 City's meter reader notices an unusually high meter reading, the City contacts the property owner and advises the customer to search for leaks. Since the City notifies customers in all customer classes of unusual high meter readings, it counts as three WUE measures for the City's program.

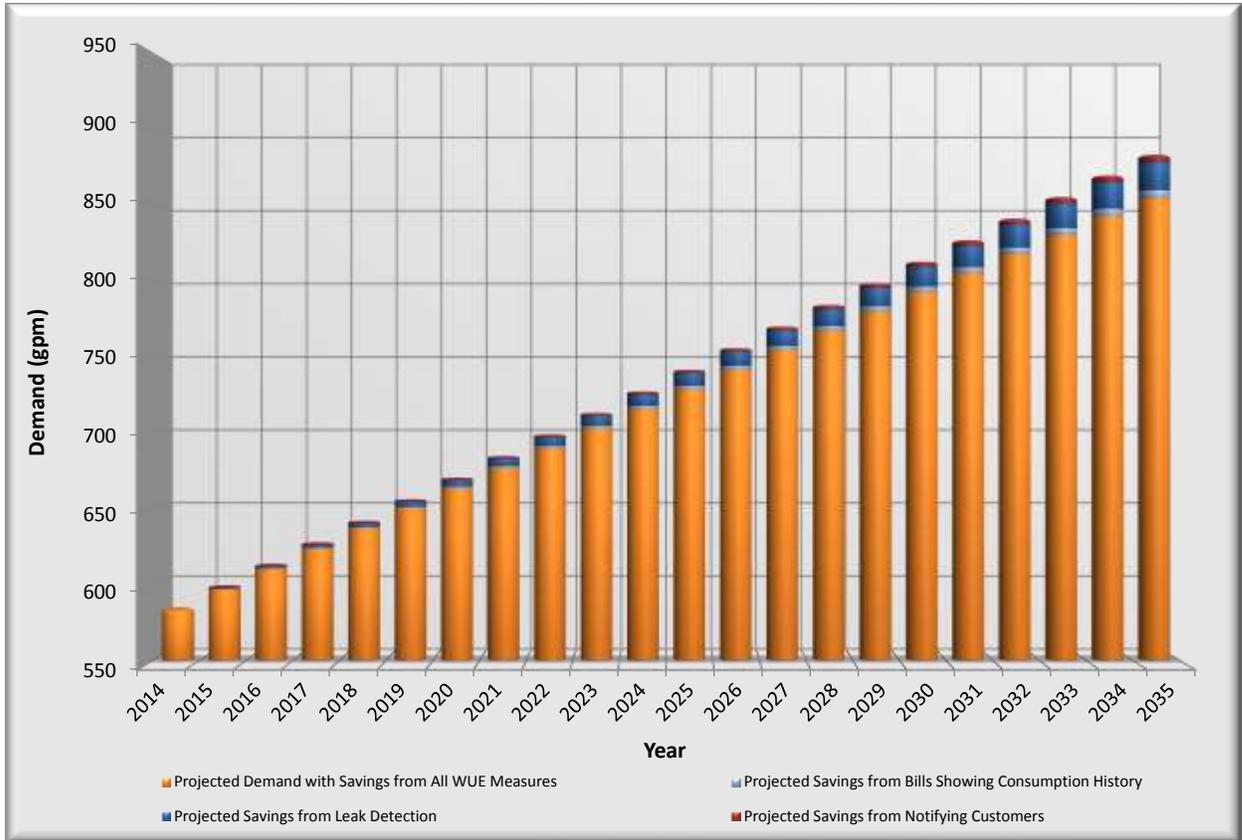
Water Use Efficiency Program Schedule and Budget

The WUE measures described above and selected for implementation by the City are summarized in **Table 3** with their corresponding schedule and budget. Most of the water use efficiency activities are funded by the City's operations and maintenance budget and the City plans to fund water use efficiency activities, such as leak detection, as needed to meet the established goals. The City also has a budget item in their water system improvements schedule for water use efficiency efforts. The successful implementation of this program is expected to reduce the 4-year rolling average demand per ERU to 185 gpd by 2035, 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	Ongoing	\$4,500
Customer Education - Annual Consumer Confidence Report	Ongoing	\$500
Measures That Must be Evaluated		
Rate Structure ¹	2010	\$0
Reclamation Opportunities	2021/2031	Sewer CIP Funded
Selected Measures		
Water Bill Showing Consumption History	In Place	\$0
Notifying Customers about Leaks	Ongoing	O&M Funded
1 = Rate structures were evaluated in the 2010 rate study.		

**Chart 1
WUE Program Projected Water Savings**



Water Use Efficiency Program Evaluation and Reporting

The City will continue to evaluate overall demand, per capita and per ERU water use, 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 per ERU 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 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 City’s 2013 CCR is included in **Appendix L** of the City’s WSP.