

## **CHAPTER 4**

### **WATER USE EFFICIENCY PROGRAM**

#### **INTRODUCTION**

A viable water use efficiency plan is a requirement of water system planning. This chapter identifies conservation and water use efficiency requirements and outlines the City of Westport's (City) Water Use Efficiency (WUE) Program for the next 10 years.

#### **WATER USE EFFICIENCY PLANNING REQUIREMENTS**

The Washington Legislature passed the Water Use Efficiency Act of 1989 (43.20.230 RCW), which directs the Department of Health (DOH) to develop procedures and guidelines relating to water use efficiency.

In 2003, the Municipal Water Supply – Efficiency Requirements Act (Municipal Water Law) was passed and amended RCW 90.46 to require additional conservation measures. The Municipal Water Law, among other things, directed DOH to develop the Water Use Efficiency (WUE) Rule, which was adopted in October 2006. The WUE Rule is outlined in the Water Use Efficiency Guidebook (Third Edition).

These documents provide guidelines and requirements regarding the development and implementation of conservation and efficiency programs for public water systems. Conservation and efficiency programs developed in compliance with these documents are required by DOH as part of water system planning documents, and by the Washington State Department of Ecology (Ecology) as part of a public water system water right application. Conservation must be evaluated and implemented as an alternate source of supply before state agencies approve applications for new or expanded water rights.

Conservation can be used effectively to help meet the increased demand for water, to protect the environment, to delay the development of costly infrastructure, and to ensure that water is available to meet economic and population growth consistent with the Growth Management Act by using existing supplies more efficiently. Public awareness and participation are necessary for NBWD to develop an active and beneficial conservation plan.

The third and most recent edition of the WUE Guidebook was released in January 2017. The WUE Rule sets stringent requirements for public water purveyors. The WUE Rule is comprised of the following seven sections:

1. WUE Requirements
2. Water Metering
3. Data Collection

4. Distribution System Leakage (DSL)
5. Water Demand Forecasting
6. WUE Goals
7. WUE Measures

## WATER USE EFFICIENCY REQUIREMENTS

The WUE Guidebook establishes varying implementation and evaluation requirements for municipal water suppliers. The requirements focus on the importance of measuring water usage and evaluating the effectiveness of the WUE program. The Rule outlines three fundamental elements which include planning, Distribution System Leakage (DSL) standards, and goal setting and performance reporting.

Table 4-1 provides a summary of the WUE Rule requirements applicable to NBWD.

**TABLE 4-1**

### Summary of WUE Requirements

Requirement	District Compliance
Include WUE Program in Planning Documents	✓
Set WUE Goals	✓
Submit Service Meter Installation Schedule	✓
Submit First Annual Performance Report	✓
Meet DSL Standard (Based on a 3-Year Rolling Average)	(1)
Complete Installation of All Service Meters	✓

- (1) NBWD has a 3-year rolling average of 12 percent DSL, greater than the WUE DSL Standard of 10 percent. To address this non-compliance, the District has implemented a Water Loss Control Action Plan.

## WATER METERING

The WUE Rule requires all sources and customer service connections to be metered by 2017. NBWD currently meters all sources and customers and is, therefore, in full compliance with this requirement. All new sources and customers will continue to be metered.

## DATA COLLECTION AND REPORTING

The WUE Rule requires regular collection of production and consumption data. Data must be reported in the District’s planning documents and an annual performance report submitted to DOH. Water use data will be used for the following:

- Calculating leakage;

- Forecasting demand for future water needs;
- Identifying areas for more efficient water use;
- Evaluating the success of the WUE program enacted;
- Describing water supply characteristics;
- Aiding in decision-making about water management.

Table 4-2 Summarizes the water use data collection requirements.

**TABLE 4-2**

**Summary of Water Use Data Collection**

<b>Required Data Type</b>	<b>Unit of Measure</b>	<b>Collection Frequency</b>
Source of Supply Meter Readings	Cubic Feet	Daily
Peak Month <sup>(1)</sup>	Cubic Feet	-
Distribution System Leakage <sup>(2)</sup>	Gallons and Percent	-
Unmetered, Unbilled Authorized Uses <sup>(3)</sup>	Gallons	Annually
Single-Family Service Meter Readings	Cubic Feet	Every 2 Months
Multi-Family Service Meter Readings	Cubic Feet	Every 2 Months
Industrial/Commercial Service Meter Readings	Cubic Feet	Monthly

- (1) Peak month is tabulated monthly based on water production reports.  
 (2) Distribution System Leakage (DSL) is based on the annual difference of water produced and consumed. Reported to DOH annually.  
 (3) Unmetered, unbilled authorized uses are calculated from District records of flushing and testing.

This data is needed to meet the planning and performance reporting requirements and check compliance with the distribution system leakage (DSL) standard of the WUE Rule.

NBWD currently meters all sources. Water production is measured at each of the wells and all three interties, and is recorded daily. Water production data from the years 2019 through 2022 are summarized in Table 2-3 of this Plan.

NBWD’s distribution system is fully metered and these meters are replaced and calibrated regularly to ensure accurate readings. Residential and commercial service meters are read monthly year-round. As part of District policy, all new connections are required to be metered. Consumption data is shown in Table 2-5 of this Plan.

**WATER USE EFFICIENCY PROGRAM**

Under the WUE Rule, NBWD must develop a water use efficiency program as part of its planning documents. This program includes several elements, such as evaluating past conservation efforts, evaluating distribution system leakage, setting water use efficiency goals, and evaluating and implementing measures to meet these goals. NBWD’s water use efficiency program was established in 2008 and updated in 2015.

## PAST WATER USE EFFICIENCY PROGRAM

In the 2015 Water System Plan, NBWD placed two goals for the WUE Program: to maintain DSL at no more than 10 percent of net production and reduce water usage per ERU by an average of 1 percent per year over the 6-year planning horizon. The district has seen an increase in DSL since the 2015 WSP, possibly due to aging infrastructure leading to leaks along the system. The District has succeeded in meeting and surpassing a 1 percent decrease in ERU volume per year since goal two was established.

This Plan builds upon the District’s previous conservation goals and measures to continue the formal Water Use Efficiency Program.

## DISTRIBUTION SYSTEM LEAKAGE

The WUE Rule requires that water distribution systems maintain a DSL rate less than 10 percent of finished water production based on a 3-year rolling average. Distribution system leakage (DSL) is defined as the difference between production (by sources) and authorized consumption measured by service meters (plus other credibly estimated usage). DSL includes water loss due to leaks or unauthorized uses such as illegal service connections, accounting errors, inaccurate source and customer meters, and water leaving the system for any unmetered use. Unmetered uses typically include flushing of mains and fire flows, accounting errors, inaccurate source and customer meters, and water leaving the system for any unmetered use.

Table 4-3 provides annual data on distribution system leakage from 2019 to 2022. NBWD’s 3-year rolling average DSL is currently 12 percent which is higher than the WUE Rule’s 10 percent maximum allowable leakage requirement. As a result, a Water Loss Control Action Plan must be implemented and will be discussed later in this chapter.

**TABLE 4-3**

### Distribution System Leakage

Year	Metered Production (MG)	Metered Consumption (MG)	DSL (MG)	DSL (Percent)	Rolling 3-year Average DSL (Percent)
2019	92.17	84.48	7.69	8%	-
2020	99.53	85.92	13.61	12%	-
2021	98.91	86.55	12.36	10%	10%
2022	99.63	82.53	17.10	14%	12%

NBWD’s DSL has increased in recent years, possibly due to aging infrastructure, particularly asbestos concrete (AC) water main pipes, and possibly due to regular flushing at the water main dead ends at the very southwest and southeast ends of the system. To address the increased DSL, the District has recently improved their data management system to more quickly recognize leaks in the system and address them as needed. Additionally, the CIP in Chapter 7 includes projects to replace aging AC pipes, and to loop the south end of the system to eliminate the need for flushing.

**AVERAGE DAILY CONSUMPTION**

The 2015 WSP set a consumption goal to reduce water usage per ERU by an average of 1 percent per year over the next 6-years. ADD per ERU for the years 2019 through 2022, and the annual percent change, is shown in Table 4-4.

**TABLE 4-4**

**2015 Consumption Goal Evaluation**

<b>Year</b>	<b>Average Consumption per ERU (gpd)</b>	<b>Change in Consumption over previous years</b>
2018	97	-
2019	99	1.6%
2020	100	1.1%
2021	99	-1.1%
2022	90	-8.3%
<b>Average</b>		<b>-1.7%</b>

Although some years since 2018 have seen an increase in consumption (notably peaking in 2020, a year where many people spent more time than usual at home due to the COVID-19 pandemic), the four-year average exceeds the District’s goal of a 1 percent decrease per year. Additionally, since the 2015 WSP, which reported the average day water use per connection to be 112.93 gpd in 2013, water use per connection has decreased by an average of 2.4 percent per year:

$$(F/P)^{1/N} - 1 = - 2.4\%$$

Where:

- F = 90.85 gpd
- P = 112.93 gpd
- N = 9 years

The District has succeeded in meeting and surpassing a 1 percent decrease in ERU volume per year since the goal was established.

## **REVISED GOALS**

Under the new WUE Rule, NBWD must outline new water use efficiency goals as part of the WSP update, adopt these goals through a public process, and measure progress towards these goals each year. These goals must include a measurable outcome and address water demands and supply characteristics. The District's two new goals are summarized below.

- Goal 1 (Supply) - Reduce Distribution System Leakage (DSL), to no more than 10 percent of net production.
- Goal 2 (Demand) – Maintain ERU<sub>ADD</sub> of 100 gpd.

## **WATER USE EFFICIENCY MEASURES**

The WUE Rule requires the evaluation or implementation of water use efficiency measures to help meet the WUE goals. The WUE Guidebook states several measures that must be implemented or evaluated and provides a list of measures that can be counted as supplemental measures in the WUE Program. WAC 246-290-810 identifies the minimum number of water use efficiency measures that must be evaluated based on system size. Because the District serves between 2,500 and 9,999 customers, a minimum of six water use efficiency measures must be implemented. As stated in the WUE Guidebook, any WUE measure implemented across multiple customer classes counts as one measure for each customer class to which it is applied.

The following sections describe both the mandatory and supplementary water use efficiency measures evaluated and indicate which have been or will be implemented by NBWD.

### **Implement Source and Service Metering and Meter Calibration (Mandatory)**

As stated previously, NBWD currently meters all existing customers and sources and plans to meter all new customers and sources. They will also continue to calibrate source meters as scheduled and service meters as requested. Additionally, the District has converted all water meters to radio read technology in order to reduce manpower requirements associated with meter reading.

### **Implement Water Loss Control Action Plan (Mandatory if DSL >10 Percent)**

NBWD's DSL rate was 12 percent based on a 3-year rolling average in 2022, which was close, but did not meet the DOH requirement of 10 percent. As a result, the District is required to implement a Water Loss Control Action Plan (WLCAP) to remain in compliance per WAC 246-290-820(4). The District's WLCAP is included at the end of this Chapter.

North Beach Water District has established measures to reduce the 3-year rolling average DSL to 10 percent or less. Some of these measures include leak detection, meter replacement and calibration, and replacement of old, aging, and undersized pipe segments.

**Customer Education (Mandatory)**

NBWD educates customers about efficient water use by providing inserts with utility bills on an annual basis, at minimum. The inserts inform the customers of ways to reduce their water demands and also educate customers about the ways the District is working to improve system efficiency. The District will continue to distribute water use efficiency information to its customers annually.

**Evaluate Conservation Rate Structure (Mandatory)**

NBWD currently does not have a conservation rate structure. Rate increases have historically been set in 3 to 6 year increments. Water rates are currently in place through the year 2025 with incremental increases each year. The District is in a fairly rural area and does not have any large industrial or agricultural customers. The District regularly conducts rate studies and a current study is in progress for the implementation of rates post-2025. A conservation rate structure will be evaluated for potential future implementation.

**Evaluate Reclamation Opportunities (Mandatory)**

Neither NBWD nor any other entity has a municipal wastewater collection, treatment or disposal system serving the NBWD service area. Therefore, the only opportunities for wastewater reclamation would have to be by individual water users or by use of reclaimed wastewater from a neighboring area. The nearest community with a wastewater collection and treatment system is the City of Long Beach, located approximately nine miles south of NBWD.

Due to lack of a central wastewater collection and treatment system, and the costs associated with implementing such system, NBWD will not be pursuing a water reuse project at this time.

**Bills Showing Consumption History (Supplementary)**

Water utility bills that show consumption history can help customers monitor their water consumption trends. These bills give feedback to customers on their own attempts to conserve and give a reference that helps in identifying leaks or changes in water usage that customers might otherwise not be aware of. NBWD currently presents a summary of past usage on all bills that go to both residential and commercial customers.

**Notifying Customers of Leaks (Supplementary)**

NBWD notifies customers who, based on water system meter reading data, appear to possibly have a leak on their side of the water service meter.

**Water Use Audits (Supplementary)**

NBWD provides water use audits upon customer request. The District provides technical assistance to find and repair leaks for customers who suspect that they may have a leak on their side of the water service meter.

**Summary of Measures**

The WUE Rule requires all municipal water systems with between 2,500 and 9,999 connections to implement five mandatory water use efficiency measures, to evaluate two mandatory measure, and to either implement or evaluate six additional measures. The District’s water use efficiency measures are listed in Table 4-5.

**TABLE 4-5**

**Water Use Efficiency Measures**

<b>Measure</b>	<b>Requirement</b>	<b>District Status</b>
Install Production Meters	Mandatory Implementation	In Compliance
Install Consumption Meters	Mandatory Implementation	In Compliance
Perform Meter Calibration	Mandatory Implementation	In Compliance
WLCAP if DSL >10%	Mandatory Implementation	In Compliance
Educate Customers about WUE Practices Once per Year	Mandatory Implementation	In Compliance
Conservation Rate Structure	Mandatory Evaluation	In Compliance
Reclaimed Water Use	Mandatory Evaluation	In Compliance
Bills Showing Consumption History	Supplementary Implementation	In Compliance, two additional WUE measures
Notifying Customers of Leaks	Supplementary Implementation	In Compliance, two additional WUE measures
Water Use Audits	Supplementary Implementation	In Compliance, two additional WUE measures



## **EVALUATING WATER USE EFFICIENCY EFFECTIVENESS**

NBWD plans to evaluate the effectiveness of its production side WUE efforts through an annual review of DSL. The District can then prioritize projects (such as waterline replacement and meter replacement) based on the DSL percentage trend. The District plans to evaluate the effectiveness of its consumption side WUE efforts through annual review of the residential per capita water use. This evaluation will determine if education efforts are having the desired effect.

## **PERFORMANCE REPORTING**

The District must submit a performance report to DOH by July 1 each year. This annual report must include:

- Total source production and customer consumption;
- Distribution system leakage in percentage and volume; and
- Description of current WUE goals, schedule and progress toward meeting goals.

DOH has developed an online reporting form that must be used by water systems to file their annual report. Previous year's WUE annual performance reports are available in Appendix H and on the DOH website.

## **WATER LOSS CONTROL ACTION PLAN**

In 2022, NBWD's DSL was 14 percent with a 3-year rolling average of 12 percent. Both values are above the DSL standard of 10 percent. As a result, the District must implement a Water Loss Control Action Plan (WLCAP). The following elements are included in the WLCAP:

- The water loss control methods include pipe replacement to reduce leakage and replacing fault water meters. NBWD plans to routinely replace service meters to maintain radio read capability and accuracy.
- NBWD has recently improved their data management system to more quickly recognize leaks in the system and address them as needed.
- NBWD's Capital Improvement Program, which is detailed in Chapter 8, outlines future continued meter replacement and pipe replacement programs. Aging and undersized pipes can be at increased risk of leakage and projects to replace these pipes are included in the District's CIP budget. A continuous meter replacement program will also keep the maximum meter age within an acceptable range. Meters showing signs of faulty readings will be replaced first.

- NBWD's Capital Improvement Program includes a system loop at the south end of the system (D-7) which would eliminate the current need to frequently flush the dead ends present there.
- There are no anticipated technical or financial concerns that could prevent NBWD from complying with the standard. The District's financial information can be found in Chapter 9.

**Contents**

**INTRODUCTION ..... 1**

**WATER USE EFFICIENCY PLANNING REQUIREMENTS ..... 1**

**WATER USE EFFICIENCY REQUIREMENTS..... 2**

**WATER METERING..... 2**

**DATA COLLECTION AND REPORTING..... 2**

**WATER USE EFFICIENCY PROGRAM ..... 3**

**PAST WATER USE EFFICIENCY PROGRAM ..... 4**

**DISTRIBUTION SYSTEM LEAKAGE..... 4**

**AVERAGE DAILY CONSUMPTION ..... 5**

**REVISED GOALS ..... 6**

**WATER USE EFFICIENCY MEASURES ..... 6**

**Implement Source and Service Metering and Meter Calibration (Mandatory). 6**

**Implement Water Loss Control Action Plan (Mandatory if DSL >10 Percent) . 6**

**Customer Education (Mandatory) ..... 7**

**Evaluate Conservation Rate Structure (Mandatory) ..... 7**

**Evaluate Reclamation Opportunities (Mandatory) ..... 7**

**Bills Showing Consumption History (Supplementary) ..... 7**

**Notifying Customers of Leaks (Supplementary)..... 8**

**Water Use Audits (Supplementary) ..... 8**

**Summary of Measures ..... 8**

**EVALUATING WATER USE EFFICIENCY EFFECTIVENESS..... 9**

**PERFORMANCE REPORTING..... 9**

**WATER LOSS CONTROL ACTION PLAN..... 9**

  

TABLE 4-1 Summary of WUE Requirements .....2

TABLE 4-2 Summary of Water Use Data Collection .....3

TABLE 4-3 Distribution System Leakage.....4

TABLE 4-4 2015 Consumption Goal Evaluation.....5

TABLE 4-5 Water Use Efficiency Measures .....8