

# 1. WATER USE EFFICIENCY PROGRAM

## 1.1. EFFICIENCY PROGRAM

### Water Use Efficiency Measures

The water use efficiency rule was promulgated as part of the 2003 Municipal Water Law. The rule requires that purveyors implement a specified number of water use efficiency measures, based on the number of connections served by the water system. The District is required to implement six water use efficiency measures.

There are two basic criteria that must be met to establish the eligibility of a measure. (1) The measure must focus on encouraging customers to use water efficiently, and (2) The measures must not be mandatory; i.e. must not be required by WAC 246-290.

### Existing Program

Chelan County PUD's existing water use efficiency program consists of several water use efficiency measures. Many of these measures were first implemented between 2000 and 2002. These measures, and their eligibility as water use efficiency measures are discussed below.

**Conservation rates:** Rates are one of the most important and effective water-use efficiency measures at Chelan County PUD. Rates are structured in tiers; as use increases, so do costs. Current monthly rates for the Wenatchee area system are as follows:

First 3,000 gallons – \$1.94 per 1,000 gallons  
3,001 to 10,000 gallons – \$2.70 per 1,000 gallons  
Over 10,000 gallons – \$3.46 per 1,000 gallons  
5/8" Meter basic charge – \$22.70

The conservation rate structure meets both eligibility criteria and is therefore a viable water use efficiency measure.

**System-wide automated meter reading and individual meter monitoring:** In a \$1.4 million upgrade, Chelan County PUD converted water meters to an automated meter reading (AMR) system in fall 2006. In the past, water consumption had been estimated for nearly all customers during the winter because snow made it hard to reach the underground vaults where water meters are located. Automated meter reading eliminated the need for estimates. The new meters are more accurate than the meters they replaced, some of which were 10 years old or older. Automated meter reading is improving the District's ability to detect leaks early. If an excessive amount of water flows through a meter, an alarm alerts system operators to a potential problem. The District mails customers a notice informing them of the potential leak, with a list of potential causes for the customers to investigate.

As part of the AMR conversion, the PUD purchased water meter monitors for customers' use. Customers can borrow or buy a monitor and track water use from inside their homes.

The monitor attaches with a magnet to a customer's refrigerator (or any location in the home), and captures signals from the transmitter on the water meter. The monitor displays the current reading on the water meter and can display water use during intervals defined by the customer, such as for one day, or for when a lawn is being watered. The PUD supplies a worksheet to help consumers understand and compare their consumption.

Finally, the District also purchased data recorders as part of the AMR conversion. The data recorders can be programmed to record the customer's meter reading at defined intervals (every minute, hourly, etc.). The recorder can store over 20,000 data points. These recorders can be installed near the customer's meter to collect usage data. Software provided from the AMR vendor is used to extract and display the data in graphical format. The graph illustrates customer usage during the specific dates and times the recorder was installed. The data recorders can be an invaluable tool for educating customers about their water use.

The ability to detect and advise customers of leaks in their plumbing, the water meter monitors, and the water data recorders each meet both eligibility criteria and are therefore each viable water use efficiency measures. Therefore, installation and implementation of the AMR system fulfills three water use efficiency measures.

**Radio and print advertising:** The Communications department maintains a monthly schedule of customer advertising. At least one month per year, water conservation is emphasized in print and radio ads, lobby posters and bill stuffers.

This measure is in place to provide consumer education of water conservation. The water use efficiency rule requires each purveyor provide general education as part of its water use efficiency program. For this reason, this measure can not be included as one of the six measures required by the water use efficiency rule.

**Xeriscape:** Chelan County PUD's peak water use occurs during the summer irrigation season. To reduce reliance on domestic water for landscape irrigation, the PUD promotes Xeriscape, or drought-tolerant landscaping. Programs include:

1. Riverfront Demonstration Garden - In cooperation with Washington State University/Chelan County Master Gardeners, the District maintains a demonstration garden that consists of more than 50 different drought-tolerant plants and grasses. The garden is located along the popular Apple Capital Loop Trail which fronts the Columbia River.
2. PUD Headquarters Xeriscape Garden – Customers visiting District headquarters in Wenatchee are treated to a small-scale garden with landscaping featuring 20 drought-tolerant plants and grasses.
3. KPQ Home and Garden Show – Xeriscape and water conservation are the themes promoted by the PUD at the annual Home and Garden Show the second weekend in March. For the past four years the District has sponsored a popular, free presentation by gardening expert Ciscoe Morris of Seattle, with emphasis on drought-tolerant plantings.
4. Workshops – The District sponsors at least one public workshop each year on various aspects of water conservation, including irrigation practices and Xeriscape.
5. Web site – The PUD's Web site includes extensive information on Xeriscape gardening, with full-color photos of 53 plants and grasses.

The xeriscaping program meets both eligibility criteria and is therefore a viable water use efficiency measure.

**Quarterly newsletter and direct-mail outreach:** Since April 2003, Chelan County PUD has published and mailed the quarterly Water Ways newsletter to water customers. The newsletter provides tips on how to conserve and informs customers about District programs. (To see a sample, visit <http://www.chelanpud.org/water-ways.html>.)

In July 2003, 970 letters were sent to third-tier (high consumption) water customers comparing their water use to that of the average PUD customer and advising them of conservation opportunities and assistance. The District also developed a "welcome letter" and water information packet that is now sent to all new water customers informing them of available services and conservation practices.

The District's quarterly newsletter and direct mail outreach provides advanced consumer education to complement the general education required by the rule. For this reason, it shall be considered a viable water use efficiency measure.

**Comprehensive Web site:** The District's Web site (<http://www.chelanpud.org/water-conservation.html>) includes detailed water conservation information on the following subjects:

1. [Xeriscape](#)
2. [Lawn Tips](#)
3. [Outdoor Water Audit](#)
4. [Natural Landscaping](#)
5. [Hardscape](#)
6. [Hot Tub and Pool Tips](#)
7. [Water - Use it Wisely](#)
8. [Indoor Water Conservation](#)
9. [Water Trivia](#)
10. ["Water Conservation A to Z"](#)
11. [Water Conservation Links](#)

Note that the "Water - Use It Wisely" link directs consumers to a national Web site on water conservation. Chelan County PUD is a partner in the award-winning Water - Use It Wisely campaign, which gives the District access to professional marketing tools.

The District's comprehensive website provides advanced consumer education to complement the general education required by the rule. For this reason, the District's comprehensive web site is a viable water use efficiency measure.

**Outdoor water audits:** In summer 2004, the PUD developed a pilot program to perform 25 residential outdoor water audits for high-use customers. A consultant was hired to conduct these first audits. Later, water department staff took over the responsibility of offering these audits on an as-requested basis.

The water audit program meets both eligibility criteria and is therefore a viable water use efficiency measure.

**Summary:** The District's existing water use efficiency program includes the following seven viable measures:

1. Conservation Rates
2. Customer leak detection and notification
3. Customer water meter monitoring
4. Customer water meter data recording and reporting
5. Xeriscaping program
6. Quarterly newsletter & direct mail outreach
7. Comprehensive website

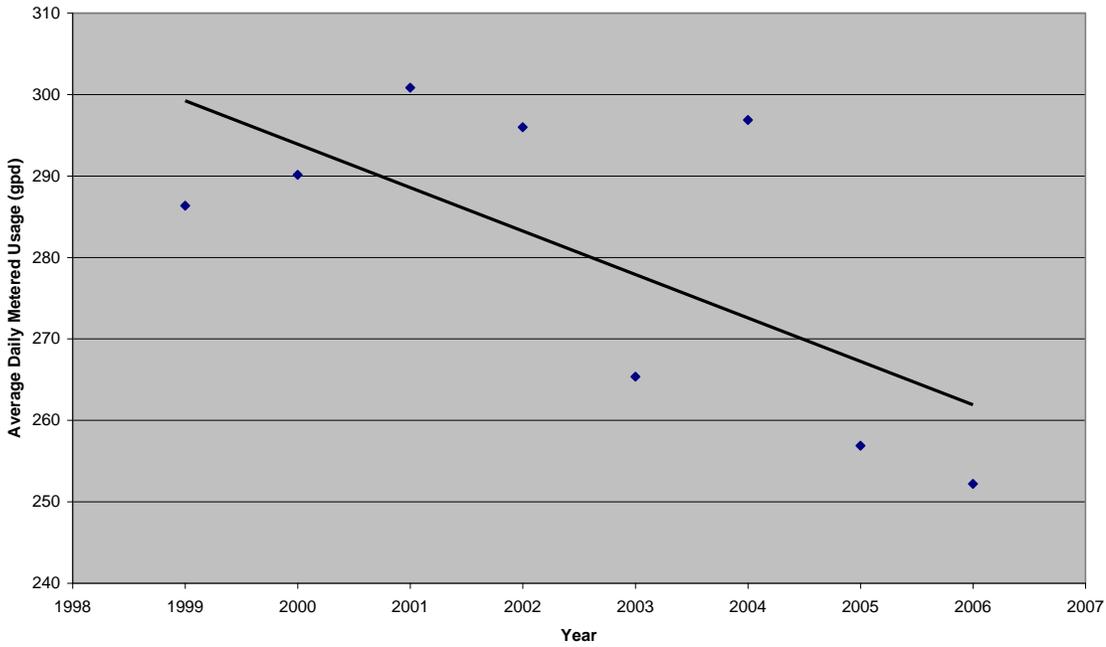
## **Past Water Savings**

Past water savings was estimated by comparing water use before implementation of efficiency measures to water use today. The historical residential and commercial water use is illustrated in Figures 4-1 and 4-2, respectively.

The average consumption per residential connection decreased from about 300 gallons per capita-day (gpcd) in 2001 to 250 gpcd, a 17 percent reduction. Similarly, the average consumption per commercial/industrial connection decreased from 2,250 gpd in 1999 to 1,800 gpd, a 20 percent reduction. Total estimated water saved from 2001 through 2006 is 477 million gallons.

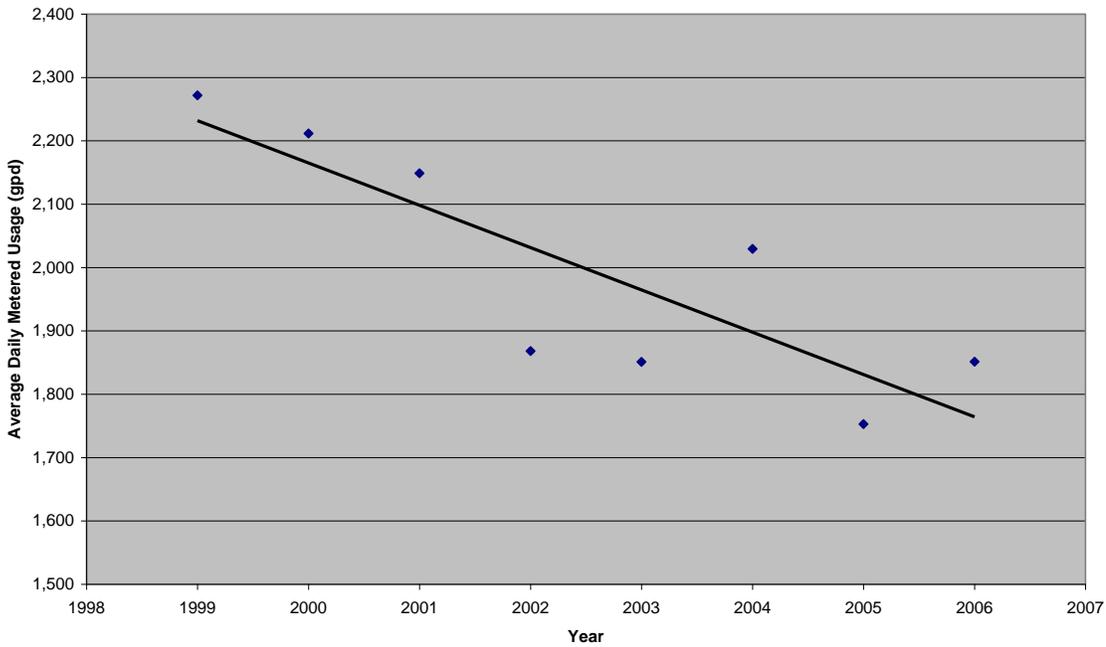
**Figure 4.1 Average Residential Customer Usage**

**Figure 4-1  
Average Residential Customer Usage**



**Figure 4.2 Average Commercial Customer Usage**

**Figure 4-2  
Average Commercial Customer Usage**



The current average annual residential consumption (approximately 260 gpd per ERU) is considerably less compared to other eastern Washington communities. The major reason is the availability of completely separate irrigation systems to many residences. The District's past conservation efforts and programs also contribute to the relatively low residential water use.

## Water Use Efficiency Goals

Chelan County PUD has selected two water use efficiency goals that include measurable outcomes in terms of water production or consumption. The selection of these goals considered the water system's forecasted demand and water supply characteristics. These goals are:

1. Reduce distribution system leakage from 15.2 percent (2006) to less than 12.5 percent by the end of the six-year comprehensive planning period (2013).
2. Reduce third-tier water consumption per equivalent residential unit (ERU) by 5 percent by the end of the six-year comprehensive planning period (2013).

These goals were established using a public process in accordance with Chapter 246-290-830 WAC. The District adopted these goals and this Water Use Efficiency Program in Resolution No. 07-13134 approved by the Board of Commissioners on July 9, 2007.

## New Water Use Efficiency Measures

New water use efficiency measures are discussed below. The symbols in brackets ( ) indicate the water use category supported by the respective measure (I = indoor; O = outdoor; ICI = industrial/commercial/institutional; A = all)

**Correct Large Meter Installations (ICI):** This measure upgraded existing large meter installations to conform to manufacturer's installation criteria for optimum meter accuracy. During implementation of the automatic meter reading (AMR) system, the District discovered several large (2-inch and larger) meters that were not installed according to manufacturer's recommendations. Common deficiencies include inadequate lengths of straight pipe prior to and following the meter and no strainer preceding the meter. The District dedicated the labor, materials and equipment and corrected problems with large meter installations by the end of 2007.

**Meter Tracking and Calibration (A):** This measure will establish a program to test and/or calibrate water meters on a regular basis. The District has not historically tracked the performance of its water meters. While planning the AMR system, the District discovered approximately 400 meters that were more than 25 years old. Several were over 40 years old. A random sample of these were tested and found to be registering approximately 30 percent of actual water flow.

The District will develop and implement a program to test and calibrate or replace water meters. A potential testing/replacement schedule would be as follows:

<u>Meter Size</u>	<u>Testing/Replacement Criteria</u>
5/8"	15 years or 2,500,000 gallons
1"	15 years or 3,250,000 gallons
1 1/2"	10 years or 5,600,000 gallons
2" & larger	10 years or 10,400,000 gallons

The District is scheduled to complete a computerized maintenance management system for its water systems by the end of 2008. This system will query meter data, and generate work orders for meters that need to be tested and calibrated. The District's existing staff will complete the work. Costs to implement this measure will be covered by the District's existing O&M budget. Increased revenue generated by accurate meters is anticipated to exceed costs to implement this measure.

## **Existing Water Use Efficiency Measures**

The District will continue to update and implement the following water use efficiency measures discussed previously. The symbols in brackets ( ) indicate the water use category supported by the respective measure (I = indoor; O = outdoor; ICI = industrial/commercial/institutional, A = All)

1. Conservation Rates (I.O)
2. Customer leak detection and notification (A)
3. Customer water meter monitoring (A)
4. Customer water meter data recording and reporting (A)
5. Xeriscaping program (O)
6. Quarterly newsletter & direct mail outreach (A)
7. Comprehensive website (A)

These measures will be administered by the District's Energy Services group. The group estimates \$6,500 is required per year to maintain these measures. This amount will continue to be included in the District's annual budget.

## **Evaluation**

The small cost to administer the existing water use efficiency measures is insignificant compared to the water utility's annual budget.

The new measure to correct large meter installations is a subcomponent of the District's system-wide automatic meter reading (AMR) project. The District performed an economic justification analysis that revealed the payback period for this project is less than one-half the estimated project life.

The new measure to implement a meter tracking and calibration program will be completed by District staff using existing software. There will be no cost to implement this measure.

The importance of conservation cannot be overstated. Reducing water consumption will extend the life of infrastructure from the source to the highest reservoir.

The District believes the qualitative benefits to society outweigh the costs of any conservation measure outlined here. Chelan PUD serves a rapidly growing area with increasing demands for utilities and services.

Conservation of resources helps preserve a quality of life in the county that includes safe drinking water and water for agriculture, power generation and fish.

The marginal cost to produce water is currently unknown. However, the feasibility of developing a new water source is being evaluated by the Regional Facility, and will be considered in future years.

## **Schedule and Budget**

The new measures are scheduled for completion and implementation by January 2008. Anticipated ongoing cost to maintain the existing measures is \$6,500. These costs will be included in the District's annual budget.

## **Consumer Education**

Chelan County PUD uses a variety of communication tools to inform customers of water-conservation practices and options. Methods include:

1. Print advertising (usually May of each year)
2. Radio advertising (usually May of each year)

3. Direct mail (letters and bill stuffers, approx. 3 times per year)
4. A quarterly conservation newsletter
5. Lobby signage (usually May of each year)
6. Comprehensive Web site (ongoing)
7. Public presentations and workshops (usually May and/or October)

## **Projected Water Savings**

Water saved due to implementation of the water use efficiency measures will include reduced third-tier consumption. It is anticipated that maintaining accurate water meters will reduce the calculated value for distribution system leakage. However, no true water savings (i.e. reduction in demand) will result from meter maintenance.

A 5 percent reduction in third-tier water use is estimated to save 51 million gallons (approximately 0.9 percent) over the six-year planning period.

## **Program Evaluation**

This water use efficiency program will be evaluated in the annual water use efficiency report. It is anticipated that progress will be made each year. The program will be reevaluated annually and modified, if needed, to meet the selected water use efficiency goals.

## **Distribution System Leakage**

Distribution system leakage was determined using the formula identified in Chapter 246-290-820 WAC. Calculated leakage for 2005 and 2006 was 18.3 percent and 15.2 percent respectively. Values calculated prior to 2005 are not reliable due to flow meter error at the two source pumping stations. The Regional Facility calibrated these meters in November 2004.

In September 2006, the District began installation of new water meters as part of its automated meter reading project. Installation was 90 percent complete by October 2006. The reduction in calculated distribution system leakage between 2005 and 2006 is attributed, in part, to new meter accuracy.

# **1.2. WATER LOSS CONTROL ACTION PLAN**

## **General**

Chapter 246-290-820 WAC requires that water systems with greater than 10 percent distribution system leakage prepare a water loss control action plan. The calculated leakage for 2005 and 2006 was 18.3 percent and 15.2 percent respectively.

This plan evaluates the data used to calculate leakage and establishes the methods, schedule and budget to reduce leakage to 10 percent or less.

## **Data Accuracy and Collection**

The leakage calculation is based on the formula provided in Chapter 246-290-820 WAC as follows:

$$DSL = [(TP-AC)/(TP)] \times 100$$

Where: DSL = percent distribution system leakage  
TP = total water produced and purchased  
AC = authorized consumption

Total water produced is obtained from invoices from the Regional Facility for both source pump stations (Hawley and Euclid). The flow meters supplying these stations were calibrated in 2004.

Authorized consumption includes:

1. Metered water sales from residential, commercial and industrial accounts. These quantities are obtained from the District's billing system.
2. Hydrant meter sales. These quantities are obtained from the District's billing system.
3. Estimated water used in the District's flushing program. The District flushes approximately 100 points per year for 15 minutes each at an average rate of 500 gpm. The total annual volume is 0.75 MG.
4. Estimated water used for construction. This volume is calculated based on newly installed water main volume, newly constructed reservoir volume (filling, flushing), etc.
5. Estimated water flowed from hydrants by the local fire districts. Based on discussions with the fire districts, this amount is relatively minor, and is estimated as 0.25 MG annually.
6. Estimated water used in fire fighting. The District estimates this amount by observing pumping rates and reservoir drawdown rates obtained from its telemetry system during the time of the fire(s). Water used in the hours or days following the major fire event for cleanup is estimated.

The following example from 2005 illustrates a typical DSL calculation:

Authorized Consumption:

Metered water sales	646.5 MG
Hydrant meter sales	7.3 MG
Flushing program	0.75 MG
Construction water	2.4 MG
Fire Dept. flushing	0.25 MG
Fire fighting	7.2 MG
Mtn. Brooke main break	.025 MG
Upper School PRV failure	0.83 MG
AC (2005)	665.25 MG
TP (2005)	814.4 MG

$$\text{DSL} = [(814.4 - 665.25) / 814.4] \times 100 = 18.3 \text{ percent}$$

The estimated quantities do not substantially impact the DSL calculation. Increasing or decreasing these estimates by 50 percent results in a calculated DSL between 17.6 and 19.0 percent. The change in calculated DSL is approximately 0.7 percent.

The District's customer water meters have been a past source of error. The District recently completed an automated meter reading project, which included replacement of most of its meters. Approximately 800 of the existing meters were over 20 years old and 2,300 were over 10 years old. The District anticipates a considerable decrease in calculated DSL with the new, accurate meters in place.

Hydrant meters are inspected and tested annually.

The final potential source of error in the calculation results from the intervals in which the water production and meter consumption data is collected. Historically, the water meters have been read in 23 routes over one month's time. Thus, a two-month period is required to collect one month of meter data. The error is reduced as

the data interval is increased. For example, if the calculated DSL based on one month of meter data, the error is substantial. However, if the DSL is based on one year of data, the percent error is significantly reduced. Using this method, the error is most likely held to 1 percent of calculated DSL or less.

The District is attempting to implement an algorithm that will more accurately estimate meter data near the beginning and end of the DSL calculation interval. The District anticipates error will be less than ½ percent using this new calculation method.

## **Control Methods**

Methods anticipated to reduce DSL are listed and discussed below.

**Data Collection and Analysis:** The District has made a significant change to its distribution system recently with the replacement of customer water meters. This change is expected to significantly reduce the calculated DSL. Thus, prior to implementing a leak detection program, the District will continue to collect DSL data.

**Distribution System Compartmentalization:** Many of the District's pump stations are outfitted with flow metering, allowing the District to measure water pumped into and out of individual pressure zones. The District will use this data to calculate DSL within smaller areas. This may uncover a specific area with significantly higher DSL compared to the overall system average. The District will consider implementing a leak detection program if the DSL within a specific area exceeds 20 percent on an average annual basis.

**Install Additional Metering:** In the event the above three methods do not reduce DSL below 10 percent, the District will install additional metering to allow for further compartmentalization of the distribution system. Metering stations would be installed or upgraded at the following locations: PS/RES1, Lester Rd BPS, S. Wenatchee Reservoir, Circle St. Reservoir, Sleepy Hollow BPS, Lower Skyline BPS.

**Feasibility Report:** In the event the above control methods do not reduce DSL to below 10 percent, the District will prepare a feasibility report. The feasibility report will evaluate the cost to perform leak detection and make repairs to reduce leakage. The report will identify any technical or economic concerns which may affect the system's ability to comply with the distribution leakage standard as per Chapter 246-290-820(4)(d) WAC.

## **Implementation Schedule**

The implementation schedule for each control method is listed below.

**Data Collection & Analysis:** 2007-ongoing

**Distribution System Compartmentalization:** 2007-2008

**Install Additional Metering:** 2010

**Feasibility Report:** 2011

## **Budget**

The budget for each control method is summarized below.

**Data Collection & Analysis:** Will be completed by District staff. No additional budget is required.

**Distribution System Compartmentalization:** Will be completed by District staff. No additional budget is required.

**Install Additional Metering:** Up to \$100,000 will be included in the District's capital budget to fund this project.

**Feasibility Report:** Will be completed by District staff. No additional budget is required.

### **1.3. SOURCE WATER**

#### **Water Quality**

The District's source water is obtained solely from the Regional Facility. The Regional Facility well field provides water from four wells. The well field is located 1,400 feet north of the Rocky Reach Dam and approximately 800 feet from the east bank of the Columbia River. The wells pull water from the Rocky Reach aquifer, at a depth of approximately 225 feet. The aquifer is bounded to the south by a grout wall constructed in the east abutment of the Rocky Reach Dam. The aquifer is bounded to the east by bedrock and to the west and north by the Columbia River.

The aquifer is a saturated stratum of unconsolidated deposits that allow water to move to the wells. Most of the water flows into the aquifer from the Columbia River. The recharge area is considered to lie north of the Rocky Reach Dam.

Water quality is considered excellent, particularly compared to other groundwater sources in North Central Washington. Year 2006 water quality, collected for the District's consumer confidence report, is summarized in Table 4-1

**Table 4-1 2006 Water Quality Analysis**

<b>SUBSTANCE</b>	<b>HIGHEST LEVEL ALLOWED ( MCL*)</b>	<b>HIGHEST LEVEL DETECTED</b>	<b>VIOLATION (YES / NO)</b>	<b>POTENTIAL SOURCES</b>
Barium (ppm)	2	ND		Erosion of natural deposits
Fluoride (ppm)	4	0.12	No	Erosion of natural deposits; discharge from fertilizer and aluminum factories
Nitrate (ppm)	10	0.19	No	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Chloride (ppm)	250	ND	No	Variable and dependent on chemical composition of water
Sulfate (ppm)	250	ND	No	Erosion of natural deposits; mine drainage wastes
Conductivity (umhos/cm 25 deg.)	700 umhos/cm 25 deg.	161 umhos/cm 25 deg.	No	Presence of ions; on their total concentration, mobility and on the temperature of measurement
Total Dissolved Solid (ppm)	500	ND	No	Matter suspended or dissolved in water
Hardness (mg/l)	Not Regulated	90 (mg/l)	Not Regulated	High concentration of calcium and magnesium ions.
Total Trihalomethanes (TTHM)	80	7.1	No	By-products of drinking water chlorination
Total Haloacetic acid (HAA5)	60	3.0	No	By-products of drinking water chlorination

## **Water Rights**

The Regional Facility shares the aquifer with the Eastbank Hatchery. The maximum day demand of the current hatchery operations is 48 cfs. The water right for the hatchery is 52 cfs. The water right is non-consumptive since all the water drawn from the aquifer is discharged to the Columbia River.

A water rights and source capacity analysis for the municipal water system was performed in the City of Wenatchee Comprehensive Water System Plan Volume 2 – Regional Service Area and Facilities. This plan was submitted to and approved by Health in 2004. The analysis in the regional plan concluded adequate source capacity and water rights to serve the regional partners through 2025. A copy of the water rights analysis and water rights self assessment for the regional system is included in Appendix L.

Since development of the Regional Plan, the District together with the Chelan County Natural Resources Department updated the water demand forecast for the Wenatchee region. As part of this analysis, the growth estimates from the Regional Comprehensive Water Plan were updated with more recent growth projections for the East Wenatchee Water District service area from the East Wenatchee Water District 2005 Comprehensive Water System Plan. This updated water rights analysis estimated that the current regional water rights would become fully utilized by the city of Wenatchee, East Wenatchee Water District, and Chelan PUD in the year 2019.

In response to these updated estimates and Chelan PUD's concerns, the Regional Facility prepared the Hydrogeologic Evaluation for the Wenatchee Regional Water Supply – Malaga – Alcoa Area, RH2 Engineering, December 2006. This document evaluated the hydrogeologic characteristics of the area

approximately between the Rock Island Dam and Malaga. The study identified five aquifer sites with the potential to provide 8,000 to 15,000 gpm of potable water.

The Regional Facility is responsible for the source of supply analysis, water rights evaluation, water supply reliability analysis, and interties pertaining to the regional water source. An update to the Regional Comprehensive Water Plan is due to the Department of Health in 2010. It is anticipated that a detailed analysis of the Eastbank aquifer and the alternative aquifers, and a revised water rights assessment will be provided in the future Regional Facility comprehensive water plan.

It is important to recognize that the District does not hold any individual water rights for its Wenatchee water system. Water rights are held by the Regional Facility for common use by Chelan PUD, the East Wenatchee Water District, and the city of Wenatchee. Therefore, it is not possible to perform a water rights self assessment exclusively for the District's individual water system.

However, the last analysis completed as part of the Regional comprehensive plan in 2004 documented adequate water rights through the year 2025. The more recent analysis (although not part of an approved water system plan) estimated adequate water rights would be available through the year 2019. Based on these analyses, adequate water rights are available for the District's current (2008) needs and 6-year (2014) needs.

## **Reliability Analysis**

The District's source water is derived from the Eastbank Aquifer, which is managed by the Regional Facility. Water is pumped from the aquifer by four large well pumps. Currently, only two of the four pumps operate simultaneously to meet peak demands of the PUD, East Wenatchee Water District, and City of Wenatchee systems. The Eastbank aquifer is situated directly adjacent to Rocky Reach Dam, and the electrical substation which provides the necessary electrical power. The reliability of the electrical system is extremely high.

In the event the Regional Facility must be removed from service, the District's source pumping stations (Euclid & Hawley) withdraw water from the City of Wenatchee's storage reservoirs, with a combined volume of 12 million gallons. The District can also utilize its own reservoirs. Upper pressure zones are configured to supply lower pressure zones through pressure reducing valve. Thus, water can be transferred from upper reservoirs to lower reservoirs as needed in the event of an extended source outage. The current combined volume of the District's reservoirs is 8.5 million gallons. Improvements planned over the next six years will increase this amount to over 10 million gallons. In comparison, the anticipated average day demand at the end of the six year planning period (2013) is approximately 2.6 million gallons.

Each of the District's booster pumping stations are configured to supply the maximum day demand plus fireflow replenishment over a 72-hour period with the largest pump out of service. This is accomplished by providing one complete redundant pumping unit in each booster station.

## **1.4. RECLAIMED / NON-POTABLE WATER ANALYSIS**

There are two potential activities that could reduce the demand on the Regional aquifer. These include reuse of water reclaimed from public sewage and water conservation or recycling at the Eastbank Hatchery. These activities both have the potential to reduce the demand on the Eastbank Aquifer. Each of these alternatives is discussed below.

### **Reuse of Reclaimed Water**

Reuse of reclaimed water is administered by the Washington departments of Health and Ecology through the Water Reclamation and Reuse Standards (September 1997). Reclaimed water is wastewater treated to varying

levels based on the intended use. The treatment levels range from Class A to Class D with Class A being the highest quality.

Typical uses of reclaimed water include irrigation, impoundments, groundwater recharge by surface percolation, commercial and industrial uses, and stream flow augmentation. The required level of treatment for each reclaimed water use is based primarily on the risk of human exposure to pathogenic microorganisms.

Several of the approved uses of reclaimed water could theoretically be implemented in Wenatchee. The first step would be upgrade of the City's wastewater treatment plant to produce reclaimed water. The City's treatment plant currently discharges approximately 3.5 million gallons per day of treated wastewater to the Columbia River.

The City is evaluating the use of reclaimed water in preparation of its General Sewer Plan. Two potential uses have been identified. These include irrigation of District parks along the Wenatchee Waterfront and melting snow that is collected and stockpiled on City property. Discussions with the City regarding the use of reclaimed water for park irrigation are ongoing.

A thorough reclaimed water analysis will continue to be performed in future editions of the Regional Facility comprehensive water plan.

## **Recycled Water**

The Eastbank Hatchery operations currently draw between 20 and 48 cubic feet per second (cfs) from the Eastbank aquifer. The Chelan PUD is preparing to study options for recycling water within the Eastbank Hatchery. Recycling could significantly reduce the instantaneous demand on the Eastbank aquifer. It is anticipated the outcome of this study will be available for analysis in the next edition of the Regional Facility comprehensive water plan.