Water Source and Water Use Efficiency

4

INTRODUCTION

The two basic objectives of a water system are to provide a sufficient quantity of water to meet customer usage demands and to provide high quality water. **Chapter 3** discusses the Lake Wenatchee Water District's (District) ability to supply a sufficient quantity of water and identifies future source requirements. This Chapter discusses the District's existing water sources, water rights and water use efficiency.

Overview

A water right is a legal authorization to use a specified amount of public water for specific beneficial purposes. The water right is most often expressed in terms of instantaneous diversion/withdrawal rate (cubic feet per second [cfs] or gallons per minute [gpm]) and annual volume (acre-feet per year [afy]). Washington State law requires users of public water to receive approval from the Washington State Department of Ecology (Ecology) prior to actual use of the water. This approval is granted in the form of a water right permit or certificate. Prior to the water codes, water right claims were filed to identify water use that the claimant believed existed and therefore represented vested rights.

EXISTING WATER RIGHTS AND CLAIMS

The District brings together what had been five independent systems (Lake Wenatchee Water Users Association, Mountain Park/Zufall, Brown Road Water Users Association, Lester Addition Water Company and Whispering Pines Water Users Association) that held six water rights from various sources of supply. The cumulative total of the water rights held by the District is 1.92 cfs (862.5 gpm) instantaneous rate and at least 113.76 afy annual volume as shown in **Table 4-1**. This includes water rights from three different well sources, one spring source and three Barnard Creek sources.

Table 4-1
Existing Water Rights

DOH Source No.[1]	Source Name	Water Right Number	Priority Date	Instantaneous (Qi) Primary (cfs)	Instantaneous (Qi) Primary (gpm)	Annual (Qa) Primary (acre-ft)	Annual (Qa) Primary (gpm)	Annual (Qa) Supplemental (acre-ft)
S02	Dickinson Well (Lake Wenatchee Users)	Claim 017516	6/14/1909	0.8	359.1	17.76	11.0	
S01	Zufall Well (Mountain Park)[2]	Claim 030577	6/20/1933	0.11	50	4.5	2.8	
S01 & S02	Barnard Creek & Brown Road Well (Brown Road)	SWC 8453	11/16/1961	0.2	89.8	55	34.1	
	Barnard Creek (Lester)[3]	SWC 9776	8/15/1963	0.1	44.9	6	3.7	
S01	Barnard Creek (Whispering Pines)[4]	S3-00959C	12/18/1969	0.6	269.3	18	11.2	
S02	Barnard Creek Spring (Whispering Pines)[5]	S4-26470C	10/26/1979	0.11	49.4	12.5	7.7	18
			TOTAL	**1.92**	**862.5**	**113.76**	**70.5**	**18**

1 = Since these were independent water systems, the originally assigned Source Number, if one was assigned, is shown here. New source numbers should be assigned for the District to avoid confusion.

2 = Nothing is noted for the annual volume claimed. For planning purposes, the annual right was estimated to be 4.5 acre-feet based on 0.5 acre-ft times the number of connections (9).

3 = No annual volume was indicated on the certificate. For planning purposes, the annual right was estimated to be 6 acre-feet based on 0.5 acre-ft times the number of connections (12).

4 = The lanugage on the report of examination indicated that "The total annual diversion for community domestic supply use authorized under permit for this application shall not exceed 18 acre-feet less any amount diverted for this use under other rights appurtenant to the same lands." At the time the ROE was written, there was another active permit (15951) that has since been cancelled.

5 = The language on the original report of examination and certificate indicated that "A total of 30.5 acre-feet shall be allowed for the purpose of community domestic supply, less any amount applied to these same lands under existing rights". Since both S3-00959C and S4-26470C are being used to supply water to the same lands, the total combined annual quantity that can be diverted under these two water rights is 30.5 afy. Of that 30.5 afy, up to 18 afy can be diverted under S3-00959C, or up to the full 30.5 afy can be diverted under S4-26470C.

Each individual water right, organized by the system that originally held it, is listed in **Table 4-1** and **Appendix C** and discussed below.

Lake Wenatchee Water Users Association

The Lake Wenatchee Water Users Association (Lake Wenatchee Users) held water right claim number 017516 to divert water from the Dickinson Well for community domestic residential use (0.8 cfs and 17.76 afy) with a claimed date of first use of June 14, 1909. Originally, the water right was just for diversion from Fall Creek. However, a change to this water right was processed by the Chelan County Water Conservancy Board and ultimately approved by Ecology with modifications on May 8, 2002. This change application also split the claim into a Record A, which was retained by the Lake Wenatchee Users and a Record B, which was retained by Don West, LLC. Only the Lake Wenatchee Users portion is available for use by the District and will be discussed here. The 2002 decision changed the approved point of diversion/withdrawal from Fall Creek to the Dickinson Well. However, the change approval listed the wrong legal description for the Dickinson Well. So, in June 2009, the Lake Wenatchee Users filed another change application (CS4-017516CL(A)@4) to correct this error, which is still pending as of the date of this Water System Plan (WSP). Water Right Claim 017516 is for municipal water supply purposes since the Lake Wenatchee Water Users Association system serves 15 or more residential service connections and/or provides residential water to a nonresidential population of 25 people for at least 60 days a year. The Lake Wenatchee Water Users Association is a municipal water supplier.

Mountain Park/Zufall

The Mountain Park/Zufall (Mountain Park) water system held water right claim number 030577 to withdraw water from a well for domestic use with a claimed date of first use of June 20, 1933. The name on the face of the water right claim is Mr. Ralph Zufall. This document indicates that he claimed 50 gpm but was only using 25 gpm when the claim was filed in 1973. It does not have any information related to the annual volume claimed or used at the time of filing. Water Right Claim 030577 is not for municipal water supply purposes since the system serves less than 15 residential service connections and does not provide residential water to a nonresidential population of 25 people for at least 60 days a year. Therefore, the Mountain Park/Zufall water system is not a municipal water supplier.

Brown Road Water Users Association

The Brown Road Water Users Association (Brown Road) held surface water certificate number SWC 8453 to divert water from Barnard Creek and withdraw water from a well for domestic use (0.2 cfs and 55 afy) with a priority date of November 16, 1961. Originally, the water right was just for diversion from Barnard Creek. However, a change to this water right (CS4-SWC8453@1) was processed by the Chelan County Water Conservancy Board and ultimately approved by Ecology with modifications on June 18, 2003. This change added a well as an additional point of withdrawal/diversion while retaining the original Barnard Creek diversion. Even though the Barnard Creek diversion was retained on SWC 8453 when the well was added as an approved point of withdrawal, the water system has been relying solely on the well as its source of supply since October 2003. SWC 8453 is for municipal water supply purposes since the Brown Road Water Association system serves 15 or more residential service connections and/or provides residential water to a nonresidential population of 25 people for at least 60 days a year. The Brown Road Water Association is a municipal water supplier.

Lester Addition Water Company

The Lester Addition Water Company (Lester) held surface water certificate number SWC 9776 to divert water from Barnard Creek for community domestic supply of 10 homes (0.1 cfs) with a priority date of August 15, 1963. Since issuance of the certificate on October 24, 1966, no requests have been made to change any attributes of this water right. As is common on older surface water rights, there is only an instantaneous rate listed with no mention of the authorized annual volume. Water Right SWC 9776 is not for municipal water supply purposes since the system serves less than 15 residential service connections and does not provide residential water to a nonresidential population of 25 people for at least 60 days a year. Therefore, the Lester Addition Water Company is not a municipal water supplier.

Whispering Pines Water Users Association

The Whispering Pines Water Users Association (Whispering Pines) held two water rights: 1) surface water certificate number S3-00959C to divert water from Barnard Creek for domestic use (0.6 cfs and 18 afy) with a priority date of December 18, 1969; and 2) surface water certificate number S4-26470C to divert water from a spring that is tributary to Barnard Creek for domestic use (0.11 cfs and a total of 30.5 afy) with a priority date of October 26, 1979. For S3-00959C, no changes have been processed on this water right certificate since its issuance. However, in November 2001, Whispering Pines submitted a change application to Ecology (CS3-00959C) that requests to change the point of diversion from Barnard Creek to a spring that is tributary to Barnard Creek. This is the same spring that is currently approved as the point of diversion under S4-26470C. This change application is still pending as of the date of this WSP. Originally, water right S4-26470C was just for diversion from Barnard Creek. However, a change to this water right (CS4-26470C) was processed and ultimately approved by Ecology on October 21, 1992. This change made the spring that is tributary to Barnard Creek the authorized point of diversion and removed authorization to use the original Barnard Creek point of diversion.

The two water rights held by Whispering Pines contain provisional language that has been interpreted by the District as described below. The original report of examination for S3-00959C contained a provision that stated "The total annual diversion for community domestic supply use authorized under permit for this application shall not exceed 18 acre-feet less any amount diverted for this use under other rights appurtenant to the same lands." At the time the report of examination was written there was another active permit (15951) for the project that has since been cancelled. Since the right that preceeded this right has been cancelled, this right should be considered primary.

For S4-26470C, the language on the original report of examination and certificate indicated that "A total of 30.5 acre-feet shall be allowed for the purpose of community domestic supply, less any amount applied to these same lands under existing rights." Since both S3-00959C and S4-26470C are being used to supply water to the same lands, the total combined annual quantity that can be diverted under these two water rights is 30.5 afy. Of that 30.5 afy, up to 18 afy can be diverted under S3-00959C, or up to the full 30.5 afy can be diverted under S4-26470C. Both S3-00959C and S4-26470C are for municipal water supply purposes since the Whispering Pines Water Association system serves 15 or more residential service connections and/or provides residential water to a nonresidential population of 25 people for at least 60 days a year. The Whipering Pines Water Association is a municipal water supplier.

WATER RIGHTS EVALUATION

An evaluation of the District's existing water rights was performed to determine the sufficiency of the water rights to meet both existing and future water demands. However, two of the water right documents do not contain information on what annual volume could be used. These two water rights are claim number 030577 and SWC 9776. For planning purposes, and lacking any metering data, it was assumed that the water use under these two water rights would be similar to the other water systems proposed for incorporation into the

District. During processing of the change application for the Lake Wenatchee Users in 2002, Ecology recognized an annual volume of approximately 0.5 acre-feet per year per connection. Multiplying 0.5 acre-feet per year per connection times the number of lots or the current number of approved connections for Mountain Park/Zufall (9 connections) and Lester (10 connections) produces an annual volume estimate of 4.5 afy and 5 afy, respectively. This adds 9.5 afy to the other water rights and results in an estimated total annual volume of 112.76 afy as shown in **Table 4-1** and the Water Right Self-Assessment in **Appendix C**.

Table 4-2 compares the maximum instantaneous water right rate with the maximum day demand of the system and the maximum annual water right volume with the average day demand of the system. As shown in the table, the District has sufficient water rights (both instantaneous and annual rates) to meet the demands of the existing customers.

Table 4-2 also summarizes the results of the future water rights evaluation, which compares the water rights of the existing sources with the system's future 6 and 20-year demand projections. The analysis considered future demand projections without additional water use reductions from planned conservation efforts. The results of the future water rights evaluation indicate the District has sufficient instantaneous and annual water rights to meet the projected maximum day and average day demands beyond 2029.

Table 4-2
Existing and Future Water Rights Evaluation

Description	Instantaneous Rights/ Maximum Day Demand (gpm)	Annual Rights/ Average Day Demand (acre-ft)	Annual Rights/ Average Day Demand (gpm)
Existing Year 2009			
Total Water Rights	862.5	113.76	71
Existing Water Demand	69	56.0	34
Surplus (or Deficient) Rights	793.7	57.76	36
Projected Year 2015			
Total Water Rights	862.5	113.76	71
Projected (2015) Water Demand	76	61.0	38
Surplus (or Deficient) Rights	786.5	52.76	33
Projected Year 2029			
Total Water Rights	862.5	113.76	71
Projected (2029) Water Demand	93	75.0	46
Surplus (or Deficient) Rights	769.9	38.76	24

Future Water Right Actions

Given the District's goal to reduce treatment, operations and maintenance costs for its surface sources, it is likely that change applications will be submitted in the future to change from surface water to groundwater sources. Prior to submitting change applications, it is recommended that the District meet and coordinate with Ecology on the proposed changes. Depending on the timeliness of processing, the District could either submit to Ecology or the Chelan County Water Conservancy Board. Since all of the water appropriated under these water rights would naturally flow into Lake Wenatchee, and past changes by Lake Wenatchee Users and Brown Road have allowed movement from surface to ground water, the likelihood of success should be high if sufficient quantities of groundwater are physically available at the desired well location.

When a change application is submitted to change the point of diversion/withdrawal, it is recommended that the District also request to change the purpose of use from what the most recent water right document currently says to municipal water supply purposes. When any change application is processed, a tentative determination will be made by Ecology as to the extent and validity of the right being transferred. The advantage of changing the purpose of use to municipal water supply purposes is that if the change is approved, the water right becomes protected from relinquishment and the place of use becomes the most recently approved service area in their Water System Plan. This can give the District more flexibility

on how to operate the system without fear of losing the ability to access those water rights in the future.

The District should pursue having either Ecology or the Chelan County Water Conservancy Board complete the processing of the two change applications that were filed by Lake Wenatchee Users (CS4-017516(A)@4) and Whispering Pines (CS3-00959C). The Lake Wenatchee Users change needs to be processed to correct an error on the legal description of the Dickinson Well that was approved as a point of withdrawal in a prior change decision. The Whispering Pines change needs to be processed to recognize the de facto change that has occurred with Whispering Pines utilizing both of its water rights from the spring source as opposed to just S4-26470C, whose point of diversion was moved to the spring through a water right change application in 1992.

RCW 90.54.020(8) states that development of water systems that provide water to the public generally in regional areas within the state shall be encouraged. The formation of the District and the proposed future incorporation of the five private water systems into the District represent an opportunity to fulfill the desire of the legislature.

One advantage of District ownership of the water rights is that the District would be viewed as a municipal water supplier , since it would hold municipal water supply water rights. As such, the authorized place of use of the municipal water supply water rights are automatically updated by approval of this Water System Plan to match the water service area shown in **Figure 1-1.** The District's proposed retail service area incorporates the original place of use of the six water rights that are currently providing the source of supply for the five water systems, as well as adjacent areas that do not have public water service. Additionally, the Department of Health (DOH) will be responsible for determining the approved number of connections. Regardless of water right ownership, the water rights for Mountain Park/Zufall and Lester will not be included as municipal water supply water rights since they do not serve enough residential connections. These two non-municipal water supply water rights will retain the place of use as indicated on the water right document and Lester will continue to be limited to no more than 10 connections, as prescribed in the original report of examination.

If the District decides to cease using any of the sources and associated water rights, it is recommended that the District consider transferring those water rights to a new point of diversion/withdrawal or into the Trust Water Rights Program on a temporary basis to protect them from relinquishment. Relinquishment occurs when there are five or more consecutive years of non-use without sufficient cause.

The District might also consider requesting that Ecology issue amended certificates (referred to as conforming documents) under RCW 90.03.560 to specifically state on the face of the documents that qualify under RCW 90.03.015 that the purpose of use is municipal water supply purposes. As long as the water use meets the definitions in RCW 90.03.015, the purpose of use will automatically be recognized as municipal water supply purposes, regardless of the language on the face of the water right document. Requesting conforming documents simply matches the language on the water right documents to the definition in the water code.

Based on the instream flow rule for the Wenatchee River Basin, Water Resource Inventory Area 45, Chapter 173-545 WAC, the District may qualify for a reservation of water for certain uses. However, it is unknown if the reservation quantity would be sufficient to satisfy all senior applicants in addition to any future demands that the District might have above its existing rights. Since the District may require additional water for full build-out beyond the twenty year planning horizon, it is recommended that the District pursue conversion of the six existing water rights to municipal status and consider other means of acquiring water rights such as purchase and transfer of existing rights and exempt well consolidation.

WATER USE EFFICIENCY PROGRAM ELEMENTS

INTRODUCTION

The District 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 District'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 Water Use Efficiency 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 Water Use Efficiency Rule to enhance the efficient use of water by the system and/or its consumers.

The Water Use Efficiency 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 and forecast demands;
- Evaluate WUE measures; and
- Implement a WUE program.

Water Use Efficiency Program Requirements

The *Water Use Efficiency Guidebook,* originally published by DOH in July 2007 and revised in January 2009, 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 WSP as required by DOH and is necessary to obtain water right

permits from Ecology. The *Water Use Efficiency Guidebook* defines the necessary components of a WUE program as four 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. For systems with less than 500 connections, the DSL standard may be increased to 20 percent if a request with supporting data is provided to DOH.
3. Goal setting to provide a benchmark for achievement and help define the success of the WUE program.
4. Annual performance reporting on progress towards meeting WUE goals.

WATER SUPPLY CHARACTERISTICS

The five existing water systems currently hold several water right claims and certificates for the supply facilities shown in **Table 4-3.** A summary of these water rights for these source facilities was previously presented in **Table 4-1**. Should the District be requested to assume operation and ownership of the individual water systems, the District will pursue acquisition of the water rights associated with each water system. Additional water rights information for each source may be found on the certificates, permits and water rights self-assessment, which are included in **Appendix C**.

Table 4-3
Water Supply Characteristics

Well	Source Location (2)	Source Description	Year developed / placed in Production	Existing Production Capacity (gpm)	Water Right Status (4)	Source Notes
Lk Wen Wtr Users Well	NESE S13T27NR16E	Groundwater	1993/2001	30	Claim	
Brown Road Well	NWSE S18T27NR17E	Groundwater	1993/2002	66	Certificate	
Whispering Pines Spring (1)	NWSW S18T27NR17E	Groundwater	1979	50	Certificate	(5)
Lester Intake (1)	NWSW S18T27NR17E	Surface	1963	34	Certificate	(5)
Mountain Park Well (1)	SENE S14T27NR16E	Unknown (3)	unknown	50	Claim	

1 - These sources are proposed to be upgraded, transferred or abandoned within the proposed 20 year plan;
2 - See Figure 1-4 for vicinity map of supply source locations
3 - Not classified but probably groundwater under the influence of Lake Wenatchee
4 - See Table 4-1 for additional information regarding the water rights for each of these sources
5 - No seasonal variation noted in capacity of surface source

The source of water for recharge of the groundwater supplies is primarily precipitation that occurs in the winter months. It is assumed that the primary location for the groundwater recharge area is north of the supply sources. Given that the recharge area is federally owned and will not be available for development, it does not appear that the aquifer recharge areas will be impacted by development within the District's proposed retail service area. Groundwater recharge to the existing sources of supply occurs within the Wenatchee River watershed (WRIA

45) and these sources are beneficially used within WRIA 45. WIRA 45 is one of the 16 fish-critical basins established by Ecology.

Based on review of the existing water rights, it appears that they are all senior to in-stream flow rule and not subject to limitation by stream flow in the Wenatchee River or its tributaries. The Wenatchee River Watershed is home to three federally listed fish species including endangered Upper Columbia River spring Chinook salmon, threatened Upper Columbia River steelhead, and threatened bull trout.

Environmental factors such as drought or climate change may affect recharge to the sources. Groundwater levels fluctuate seasonally but recover each spring to previous year levels. Some general declines in water levels during pumping are attributed to well inefficiency, which will be addressed within the 6-year planning period as part of the WSP CIP to rehabilitate existing wells or replace supply sources in the same body of groundwater.

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 District's water use data, demand forecasts and other planning requirements are contained in **Chapter 2**. The District'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 shall be evaluated and reestablished a minimum of every six years. A public hearing to present and discuss water efficiency goals will be held shortly after the acquisition of the first water system into the District. Background on the District's proposed WUE program, water supply characteristics, water demand forecasts and other elements will be made available two weeks prior to the public forum date. All comments received at the forum will be reviewed and considered by the District. The District's WUE goals will be subsequently adopted by the District. Following initial adoption, WUE goals will be evaluated and reestablished during the water system planning process, or, at minimum of every six years. The following WUE goals will be considered by the District.

- Reduce the average demand per equivalent residential unit (ERU) to 370 gpd per ERU by 2019 and to 359 gallons per day per ERU by 2029.
- Reduce the distribution system leakage to 10 percent or less by 2029.

Evaluation and Selection of Water Use Efficiency Measures

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

The District will serve less than 500 water service connections upon assumption of the 5 water systems. Based on the number of connections, at least one WUE measure must be evaluated or implemented. Measures that are mandatory cannot be credited towards the system's WUE measures. Since the District 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 District's sources except for the Mountain Park well and the Lester intake. If either of these two systems are acquired by the District, and these sources are retained for use, then source meters will be installed as part of initial capital improvements. 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. All service connections in the system will be fully metered within five years of assumption of the first water system. All future connections that are installed or activated will be equipped with a service meter prior to the availability of water. Service meters for residential users will be read on a monthly basis. The District will replace meters as soon as broken meters are identified.

Meter Calibration

The District must calibrate and maintain meters based on generally accepted industry standards and manufacturer information. Compliance will be maintained by the District by performing maintenance on the source and service meters every five to ten years at a minimum. Meter calibration is performed on an as-needed basis, typically when meter readings are inconsistent with customer consumption history.

Distribution System Leakage

The collection of service meter data is a significant element in obtaining water loss information and calculating DSL. Water service meters must be installed on all existing service meters per WAC 246-290-820(2)(a). The District will install water service meters on all existing and future water service connections. The annual WUE reports submitted to DOH will contain the District's progress on the installation of water meters on all connections and any actions taken to minimize leakage in the system.

Water systems with less than 500 connections are allowed up to 20 percent DSL if the system requests a higher percentage of leakage and the system submits the following items to DOH.

- Production volume.
- DSL volume.

- Leak detection survey completed in the last six years.
- Repair of all leaks found.
- No additional leaks found in the distribution system.
- Leak minimization efforts included in the WUE program.
- Technical, economical or water system characteristics justification of higher percentage level.

Since water service meters are not currently installed system wide, the existing DSL cannot be calculated. However, it has been reported that leakage in the system is relatively high. The District plans to replace leaking water mains and install service meters system wide to enable the calculation and reporting of DSL.

Customer Education

Annual customer education regarding the importance of using water efficiency is a required element of all WUE programs. Customer education will be provided in the District's annual Consumer Confidence Report (CCR) and will include 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 District's proposed utility rates will be designed to discourage excessive water use. The proposed rate structure will include both a base charge and a commodity charge component. The base charge will be calculated based on ERUs of consumption, as determined from the domestic demands referenced in **Chapter 2**. The commodity charge component is based on the cost to deliver the water to the customer and calculated on actual metered consumption. The District will adopt the proposed rate structure within 45 days of the assumption of the first water association and upon completion of the installation of the water service meters. The cost of implementing this measure will be included as part of the cost of purchasing and establishing the District's billing system and will not be directly funded by the WUE program. The plan for implementing this rate structure is discussed in more detail in **Chapter 9**.

Selected Measures

The District has chosen to implement one WUE measure in addition to those that are mandatory or required to be evaluated.

Outdoor Residential Conservation Measures

Irrigation water is provided through the domestic potable water system operated by the District. Customers are encouraged to reference landscape management and xeriscaping programs at http://www.chelanpud.org/conservation/water/xeriscape/index.htm, which is a website provided by Chelan County PUD with information on plants and landscaping

native to Chelan County.

Water Bill Showing Consumption History

The District does not currently have a utility billing system for the five water systems. A utility billing system will be put into place within one year after the assumption of the first water association. The cost of implementing this measure will be included as part of the cost of purchasing and establishing the District's billing system and will not be directly funded by the WUE program.

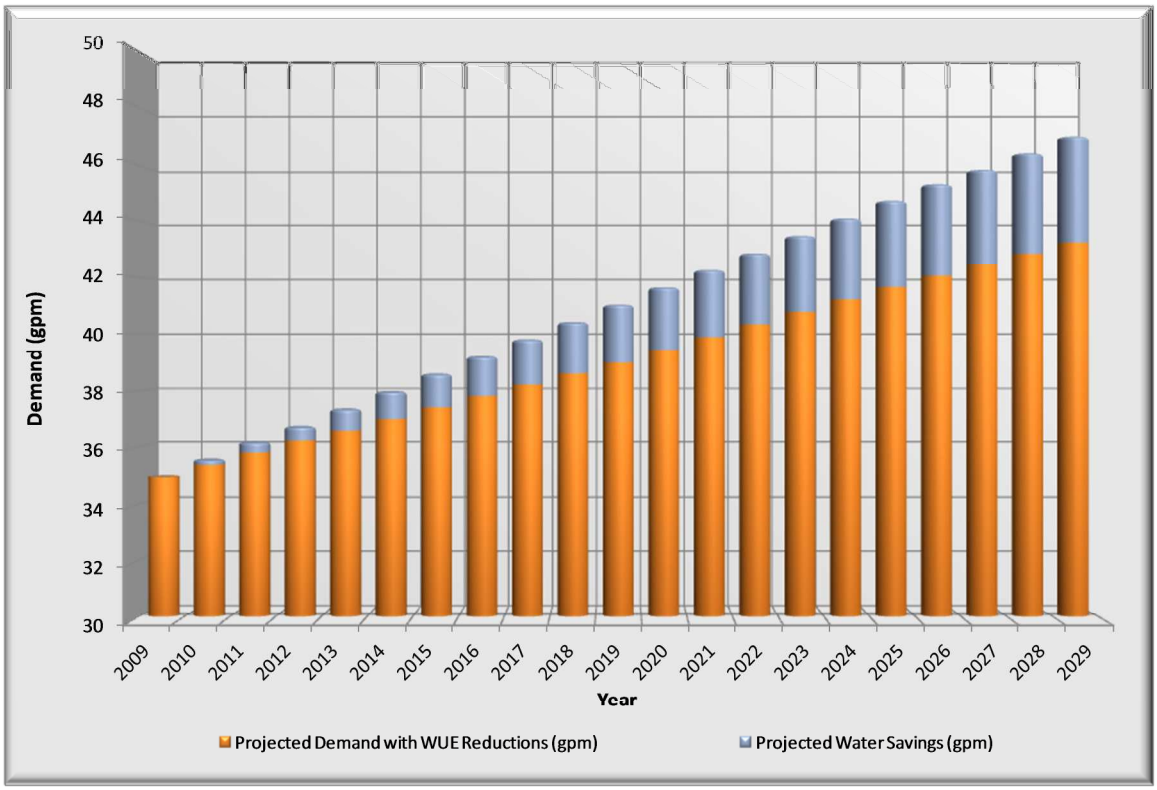
Water Use Efficiency Program Schedule and Budget

The WUE measures described above and selected for implementation by the District are summarized in **Table 4-3** with their corresponding schedule and budget. The successful implementation of this program is expected to achieve a 5 percent water use reduction by the year 2019 and an 8 percent water use reduction by the year 2029, as shown in **Chart 1**.

Table 4-3
WUE Program Schedule and Budget

Water Use Efficiency Measure	Schedule	Budget
Mandatory Measures		
Source Meters	Ongoing	O&M Funded
Service Meters	TBD	CIP Funded
Meter Calibration	Ongoing	O&M Funded
Customer Education - Annual Consumer Confidence Report	Ongoing	$500/yr
Measures That Must be Evaluated		
Rate Structure	30 days of assumption	$0
Selected Measures		
Outdoor Residential Conservation Measures	Ongoing	Chelan Co. PUD Funded
Bill Showing Consumption	1 year after assumption	$0

Chart 4-1
WUE Program Projected Water Savings



Water Use Efficiency Program Evaluation and Reporting

The District will evaluate overall demand per ERU water use and the amount of DSL on an annual basis. The District 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 District will provide annual WUE performance reports to its customers in its CCR, which will also detail the results of water use monitoring and progress towards achieving the system's WUE goals. A copy of the Whispering Pines 2006 CCR is included in **Appendix G**.

Source Protection

5

A sanitary survey of the well sites was completed in May 2009, July 2008 and April 2005 for the Lake Wenatchee Water Users Association, Whispering Pines Water Users Association, and Brown Road Water Users Association, respectively. The surveys are included in **Appendix L**.

Additional contingency and emergency response planning related to the water source is provided in **Chapter 6**.

Wellhead Protection Program

Introduction

A wellhead protection program is a proactive and ongoing effort of a water purveyor to protect the health of its customers by preventing contamination of the groundwater it supplies for drinking water. Sections 1428 of the 1986 Amendments to the Federal Safe Drinking Water Act (SDWA) mandate, that each state develop a wellhead protection program. In Washington State, the Department of Health (DOH) is the lead agency for the development and administration of the State's wellhead protection program. All federally defined Group A public water systems that use groundwater as their source are required to implement a wellhead protection program. All required elements of a local wellhead protection program must be documented and included in either the Comprehensive Water System Plan (applicable to the Lake Wenatchee Water District) or Small Water System Management Program document (not applicable). The State mandate for wellhead protection and the required elements of a wellhead protection program are contained in WAC 246-290-135, Source Protection, which became effective in July of 1994. The minimum required elements of a wellhead protection program for water systems in Washington State that rely on groundwater are as follows.

- A completed susceptibility assessment of each water source.
- Delineation of wellhead protection areas for each water source with the six-month, one, five and ten-year time of travel (TOT) boundaries marked using DOH or Environmental Protection Agency (EPA) guidance for delineation.
- An inventory of known and potential contaminant sources located within the defined wellhead protection areas, which shall be updated every two years.
- Documentation of the purveyor's notification to all owners/operators of known and potential sources of groundwater contamination within the defined wellhead protection areas.
- Documentation of the purveyor's notification to regulatory agencies and local governments of the defined boundaries of the wellhead protection areas and the findings of the contaminant source inventory.
- A contingency plan to ensure that customers have an adequate supply of water in the

event that contamination causes a temporary or permanent loss of the system's principal source of supply.

- Documentation of the purveyor's coordination with local emergency spill responders (including police, fire and health departments), including notification of wellhead protection area boundaries, and results of the susceptibility assessment, inventory findings and contingency plan.

SUSCEPTIBILITY ASSESSMENT

In 1994, DOH developed the Susceptibility Assessment Survey Form for water purveyors to complete to determine a drinking water source's potential for contamination. The results of the susceptibility assessment may provide monitoring waivers that allow reduced source water quality monitoring.

The three susceptibility ratings DOH assigns to sources are low, moderate and high. DOH assigned a high susceptibility rating to Whispering Pines. The Lake Wenatchee Users, Brown Road, and Mountain Park systems have not had susceptibility assessments and were therefore identified as Unknown/High susceptibility.

DELINEATION OF WELLHEAD PROTECTION AREAS

A wellhead protection area is the surface and subsurface area surrounding a well, well field, or springs, through which contaminants are likely to pass and eventually be transported into the drinking water system. This is the area around the source that must be managed to protect the water supply from contamination. Establishing or delineating the boundaries of the wellhead protection area for each source is most commonly accomplished using the estimated TOT rates of groundwater.

Wellhead Protection Area Zones

The first component of a wellhead protection area is the sanitary control area required by WAC 246-290-135. This protective area should already be tightly controlled by the purveyor to minimize direct contamination at the wellhead. The minimum sanitary control area for a well shall be a radius of 100 feet around the wellhead and 200 feet around springs. The construction, storage, disposal or application of known or potential contaminants is prohibited within this area unless permitted by DOH and the water purveyor.

Wellhead protection areas are based on six-month, one-year, five-year, and ten-year time of travel zones. For example, a one-year time of travel zone represents an area around the well or well field in which contaminants could reach the well within one year. Each zone has different management strategies based on the urgency of response and characteristics of risks to public health posed by contaminants within the zones. An additional zone, called the buffer zone, may also be established to provide an area of added protection outside the ten-year time of travel zone for the wellhead protection area.

Delineation Methods

There are several delineation methods that can be used to define wellhead protection areas, but the simplest approach is the Calculated Fixed Radius (CFR) method. This method requires the least technical data and is typically used for the initial delineation to identify

immediate threats to water quality. Data input includes the annual volume pumped by the well, the open interval or length of the well screen, the aquifer porosity and the travel time (typically six-month, one-year, five-year, and ten-year). The TOT data calculated from the CFR method is used to create circular boundaries around each of the wells or well fields representing the hypothetical distance that a contaminant will travel for the given length of time.

The major drawback of the CFR method is that groundwater rarely behaves this simply; therefore, additional study of the aquifer in question is recommended to determine more accurate protection zones. Other more complex (and probably more accurate) delineation methods utilize analytical models, hydrogeologic mapping and computer flow models. The District's wellhead protection TOT zones were based on the CFR method.

Delineation Results

The District utilized the CFR method and annual water rights quantity to establish the wellhead protection area boundaries. **Table 5-1** presents data for each of the District's active well sources and one spring source and the results of the CFR computations. The wellhead protection area boundaries for the six-month, one-year, five-year, and ten-year time of travel computations are presented in **Figure 5-1**.

Table 5-1
Well Data and Calculated Fixed Radius Values

Description	Brown Road	Whispering Pines	Lester	Mountain Park	Lake Wenatchee Users
Data					
Source No.	S02	S01	unknown	S01	S02
Sec-Twp-Rng	S18 T27N R17E	S18 T27N 17E	unknown	S14 T27N 16E	S13 T27N R16E
Year Constructed	1993	1993	unknown	1970	1993
Ground Elevation (ft)	2005	2900	unknown	unknown	2008
Well Depth (ft)	255	NA	unknown	20	137
Pump Intake Depth (ft)	235	NA	NA	unknown	80
Depth to Top of Screen (ft)	0	0	0	0	72
Depth to Bottom of Screen (ft)	0	0	0	0	76
Screened Open Interval (ft)	10	10	10	10	4
Static Water Depth (ft)	83.5	0	0	unknown	32.5
Pumping Water Depth (ft)	93	NA	NA	unknown	unknown
Current Pumping Rate (gpm)	89.8	49.4	44.9	50	30
Annual Volume Pumped (gal)	47,198,880	25,243,400	22,943,900	25,550,000	15,768,000
Aquifer Porosity (estimated)	0.22	0.22	0.22	0.22	0.22
Calculated Fixed Radius (CFR) Values					
6-Month Time of Travel (ft)	676	494	471	497	617
1-Year Time of Travel (ft)	955	699	666	703	873
5-Year Time of Travel (ft)	2,136	1,562	1,490	1,572	1,953
10-Year Time of Travel (ft)	3,021	2,210	2,107	2,223	2,761

Delineation Update Requirements

DOH recommends that water systems upgrade their initial delineation using a more sophisticated groundwater flow model approach within five years following the initial delineation. In addition, wellhead protection area boundaries should be reviewed and revised when new wells are brought on-line or when there is a change in the annual volume pumped from a well. DOH also recommends reevaluation of the wellhead protection area boundaries during the update of the Water System Plan, which occurs on a six-year schedule.

INVENTORY OF POTENTIAL CONTAMINANT SOURCES

An essential element of wellhead protection is an inventory of all potential sources of groundwater contamination throughout delineated wellhead protection areas. The purpose of the inventory is to identify past, present and proposed activities that may pose a threat to the source of water supply (i.e. the aquifer).

Inventory Approach

An inventory of potential sources of groundwater contamination was conducted by searching for known and potential contaminant sources. In databases maintained by the Washington State Department of Ecology (Ecology) and the US Environmental Protection Agency (EPA). In addition, the Washington State Department of Transportation (WSDOT)

was contacted regarding past automobile accidents in which hazardous materials were being transported through the Lake Wenatchee Water District service area along Lake Wenatchee Highway, a local extension of State Highway 207. The other roads in the service area are residential. The highway passes through the Brown Road Wells' ten-year time of travel zone and the six-month time of travel zones for the Lake Wenatchee Users Well and the Mountain Park Well. Aerial images of the four wellhead protection areas were surveyed during its susceptibility assessment for large yards and agricultural areas that could be sources of fertilizer, yard chemicals and pet/farm animal waste pollution.

Inventory Findings

The inventory efforts revealed several potential sources of contamination located within the District's wellhead protection areas. The approximate locations of the sites are shown in **Figure 5-1** and a list of the potential sources of contamination is shown in **Table 5-2**. Individual private wells mapped on **Figure 5-1** are represented by symbols at the center of each quarter-quad that contains a private well. The EPA Resource Conservation Recovery Act (RCRA) website revealed no additional potential contamination sources beyond those available from the Ecology databases within the wellhead TOT zones.

Other potential sources of contamination that are not specifically shown in **Figure 5-1** or listed in **Table 5-2** are discussed below.

Hazardous Spills on Highways and Roads – The Lake Wenatchee Highway passes through the ten-year TOT zone for the Brown Road Well and the six-month TOT zones for the Lake Wenatchee Users and Mountain Park wells. Vehicle accidents within this section of the highway could result in spills of gasoline or other transported hazardous materials that could threaten the aquifer which supplies water to the Brown Road, Lake Wenatchee Users, and Mountain Park wells. The remainder of the roads in the wellhead protection zones is residential and traveled by local residents and visitors, although spills could still occur on these roads. According to WSDOT, no accidents involving hazardous materials occurred between 1999 (the earliest date of their collection data) and 2009 (2009 data is preliminary). Although no accidents involving hazardous materials have been reported, spills could have occurred and are a concern given the wells' close proximity to the Lake Wenatchee Highway.

Pesticide and Herbicide Use Along Roads – The Chelan County Roads Department applies herbicides within two to three feet of the roadway to prevent the growth of vegetation in that zone. The Roads Department uses approved herbicides that do not travel through the soil. They do not apply the herbicides in areas that are wet or when snow is still present. There are areas along County roads that have signs that read "No Spray", where the adjacent land owner has signed a contract to control the weeds between the signs along the right of way. According to the Chelan County Noxious Weed Coordinator, most of these landowners prefer to use mechanical methods to remove vegetation instead of herbicides.

The U.S. Forest Service (USFS) has jurisdiction over the Wenatchee National Forest and applies herbicides and pesticides where needed. There was no available information about the history of herbicide and pesticide applications by USFS in the vicinity of the District's service area. Although the chemicals in pesticides and herbicides are a potential source of contamination to the District's water sources, the potential for contamination by USFS operations is low.

S.T.E.P. and Septic Systems – Chelan County PUD owns and operates a Septic Tank Effluent Pump (S.T.E.P.) collection system along the Northshore Road within the District retail service area. It is estimated that most of the customers of the Mountain Park and Lake Wenatchee Water Users are served by this wastewater collection system. There is no drainfield associated with a S.T.E.P. system. Not all residences with sewer availability are connected to the system and may continue to use traditional septic systems. The contamination risk to the District's groundwater sources is lower than if the region relied exclusively on traditional septic systems.

Home Oil Furnace Tanks – There may be some residents within the District's service area may be using oil furnaces to heat their homes. However, the number and location of these is assumed to be small given the availability of low cost electrical power to the area. Further the location of the District's supply sources being up gradient with respect to the residences, it is assumed that contamination from fuel oil to be low.

Hazardous Household Materials – Almost all households use hazardous materials for a variety of cleaning and maintenance. Some of these materials include cleaning solvents, paints, antifreeze and engine oil. Improper use or disposal of these may result in contamination of the District's groundwater sources. All of the wells and the springs have single-family residences located within their wellhead protection areas.

Private Wells – Poorly constructed private wells with inadequate seals and improperly abandoned wells may pose a threat to the District's groundwater sources. Poorly constructed private wells with insufficient seals provide a direct pathway for contaminants from stormwater runoff, rodents, insects and other pollutants to enter the same aquifer used by the District's wells.

Stormwater – Stormwater runoff can potentially contaminate the District's groundwater sources. Runoff from roadways can contain high levels of metals and hydrocarbons. Runoff from residential areas is typically high in nutrients, pesticides and metals. Stormwater is anticipated to infiltrate or generally flow towards Lake Wenatchee resulting in a low probability of contamination to the District's supply sources.

Creeks and Lake Wenatchee – Creeks located within wellhead protection areas can carry contaminants that may pose a threat to the City's groundwater sources. Fall Creek is a small creek that originates on the south flank of Dirtyface Mountain and flows into Lake Wenatchee, running adjacent to the Lake Wenatchee Users well. The creek flows through the Lake Wenatchee Users well's six-month TOT zone, and through the one-year TOT zone of the Whispering Pines spring source. Fall Creek and the Lake Wenatchee Users well are not hydraulically connected. Barnard Creek also originates on the south flank of Dirtyface Mountain and flows to Lake Wenatchee, through the five-year TOT zone of Whispering Pines spring and the one-year TOT zone for the Lake Wenatchee Users well. Whispering Pines spring is a groundwater source in hydraulic connection with surface water (Barnard Creek). An unnamed creek flows from the south flank of Dirtyface Mountain and Pole Ridge, through a large wetland complex and empties into Lake Wenatchee. The unnamed creek flows through the ten-year TOT zone of Brown Road well. A tributary to the unnamed creek flows through the Brown Road well's five-year TOT zone and into the unnamed creek in the ten-year TOT zone at their confluence.

No geotechnical information or studies as to groundwater flows or interaction with surface supplies are available for the District retail service area to determine the influence of Lake Wenatchee over the groundwater in the service area.

Lawn Care and Agricultural Practices – Farms and residences with large lawns, gardens or cleared areas within the wellhead protection areas can be a threat to the District's groundwater sources. Inadequate cleanup of animal waste is a potential source of fecal coliform contamination. Fertilizer runoff is a potentially dangerous source of nitrates (exposure to nitrates and nitrites causes cyanosis or "Blue Baby Syndrome" in infants). One residence is noted in **Table 5-2** as a potential contamination source because of a large lawn/cleared area.

Table 5-2
Potential Sources of Contamination

No.	Name	Address	Potential Source	WHPA Location
U-1	Chelan County Public Works	16744 N Shore Rd	Diesel	Lk. Wen. Users 10-year
L-1	Lake Wenatchee Maintenance Shop	T27 R16 Sec 14 SW 1/4 of NE 1/4, N Shore Dr	Diesel	Mt. Park 5-year
LO-1	Land Owner	22909 Brown Rd.	Potential fertilizer, yard	Brown Rd. Rd 6-month
W-1	B & J Timberlands Partnership	16617 Brown Rd.	Private Well	Lk. Wen. Users 5-year
W-2	Bakke, Knute	16629 Fir Rd	Private Well	Lk. Wen. Users 5-year
W-3	Ballinger, Francie	T27 R17 Sec 19 NE 1/4 of NW 1/4	Private Well	Brown Rd. 10-year
W-4	Bass, Dan	T27 R16 Sec 14 SE 1/4 of NE 1/4	Private Well	Mt. Park 10-year
W-5	Belcher, Donald and Judith	T27 R16 Sec 13 NW 1/4 of SE 1/4	Private Well	Lk. Wen. Users 5-year
W-6	Borgens, Leslie	T27 R17 Sec 18 SE 1/4 of SW 1/4	Private Well	Brown Rd. 5-year
W-7	Bradley, Carrie and Jeff	16700 N Shore Dr	Private Well	Lk. Wen. Users 10-year
W-8	Brucker, Thomas H.S. and Booth, T. WM.	T27 R17 Sec 18 SE 1/4 of SE 1/4	Private Well	Brown Rd. 10-year
W-9	Bulmor, Rosemary	T27 R16 Sec 13 NW 1/4 of SE 1/4	Private Well	Lk. Wen. Users 5-year
W-10	Burgess, Bill	22745 Brown Rd.	Private Well	Brown Rd. 5-year
W-11	Burgess, Brandon	22888 Brown Rd.	Private Well	Brown Rd. 5-year
W-12	Burgess, Jeff	22828 Brown Rd.	Private Well	Brown Rd. 5-year
W-13	Cade, L. & Sheahan, M.	22953 HWY 207	Private Well	Lk. Wen. Users 10-year
W-14	Carson, Craig	17215 N Shore Dr	Private Well	Lk. Wen. Users 5-year
W-15	Cape, Robert	17375 N Shore Dr	Private Well	Lk. Wen. Users 10-year
W-16	Danford, David	17065 N Shore Dr	Private Well	Lk. Wen. Users 5-year
W-17	Dickinson, Byron	17201 N Shore Dr	Private Well	Lk. Wen. Users 6-month
W-18	Dickinson, Kurt	22938 N Shore Dr	Private Well	Mt. Park 10-year
W-19	Dickinson, Mike and 3 Rivers Investments	23080 Lk Wenatchee HWY	Private Well	Mt. Park 10-year
W-20	Dickinson, R. Byron	17770 HWY 207	Private Well	Lk. Wen. Users 6-month
W-21	Farr, Jim	17683 N Shore Dr	Private Well	Mt. Park 10-year
W-22	Floyd, Dianne	23200 HWY 207	Private Well	Whispering Pines 10-year
W-23	Fredrickson, Stevan	22731 Brown Rd. Rd	Private Well	Brown Rd. 5-year
W-24	Friele, Robert	17884 N Shore Dr	Private Well	Mt. Park 10-year
W-25	Gilbertson, Dale	22748 Browd Rd	Private Well	Lk. Wen. Users 10-year
W-26	Gordon, Robert E.	16755 Fir Dr	Private Well	Lk. Wen. Users 5-year
W-27	Gouftoth, Davel	T27 R16 Sec 13 NE 1/4 of NE 1/4	Private Well	Whispering Pines 1-year
W-28	Graham, Doug	17590 N Shore Dr	Private Well	Mt. Park 1-year
W-29	Hannon, Gary	17601 N Shore Dr	Private Well	Mt. Park 1-year
W-30	Hart, Brian	16626 Fir Dr	Private Well	Lk. Wen. Users 5-year

Source of Information:
L = Ecology Leaking Underground Storage Tank List
U = Ecology Underground Storage Tank List
AI = Aerial Imagery
W = Ecology Well Log Database

Table 5-2
Potential Sources of Contamination Continued

No.	Name	Address	Potential Source	WHPA Location
W-31	Hashim, John	T27 R16 Sec 18 SW 1/4 of SE 1/4	Private Well	Brown Rd. 5-year
W-32	Hoenes, Glenn and Dejough, K.	17806 N Shore Dr	Private Well	Mt. Park 10-year
W-33	Hoyt, Ann K.	16181 N Shore Dr	Private Well	Lk. Wen. Users 10-year
W-34	Landin, Earl	22945 Lk Wenatchee HWY	Private Well	Lk. Wen. Users 5-year
W-35	Large, Ron and Livingston, Marny	17680 N Shore Dr	Private Well	Mt. Park 10-year
W-36	Lauritzen, Alan A.	22844 Lake Wenatchee HWY	Private Well	Lk. Wen. Users 5-year
W-37	Ledford, Don	18025 N Shore Dr	Private Well	Mt. Park 10-year
W-38	Leitch, Jerry	16425 N Shore Dr	Private Well	Lk. Wen. Users 10-year
W-39	Mastras, Dean	17325 N Shore Dr	Private Well	Lk. Wen. Users 5-year
W-40	McLeod, John	16403 HWY 207	Private Well	Brown Rd. 10-year
W-41	Morse, John W.	17679 N Shore Dr	Private Well	Mt. Park 10-year
W-42	MRJ Construction LLC	16438 N Shore Dr	Private Well	Brown Rd. 10-year
W-43	Nelson, Mike	17691 N Shore Dr	Private Well	Mt. Park 10-year
W-44	Norris, Lee	17229 N Shore Dr	Private Well	Lk. Wen. Users 10-year
W-45	Okanogan-Wenatchee National Forest	near 22976 HWY 207	Private Well	Mt. Park 10-year
W-46	Paton, Kenneth W.	16594 HWY 207	Private Well	Lk. Wen. Users 10-year
W-47	Peterson, Joseph	17379 N Shore Dr	Private Well	Lk. Wen. Users 10-year
W-48	Pflugrath, Lauren	17389 N Shore Dr	Private Well	Lk. Wen. Users 10-year
W-49	Puentes, Jorge (Oscar)	near 22450 HWY 207	Private Well	Brown Rd. 10-year
W-50	Radach, Mr. and Mrs Jonathan	T27 R16 Sec 14 SE 1/4 of NE 1/4	Private Well	Mt. Park 10-year
W-51	Rose, Timothy	22515 Lk Wenatchee HWY	Private Well	Brown Rd. 10-year
W-52	Steinborn, Sydney	17369 N Shore Dr	Private Well	Lk. Wen. Users 5-year
W-53	Strahm, Frank	17695 N Shore Dr	Private Well	Mt. Park 10-year
W-54	Tabor, Steve and Alexandra	17640 N Shore Dr	Private Well	Mt. Park 10-year
W-55	Two Rivers Inc.	22750 HWY 207	Private Well	Brown Rd. 5-year
W-56	U.S. Dept. of Aquiculture	T27 R16 Sec 13 NW 1/4 of SW 1/4	Private Well	Mt. Park 10-year
W-57	Wanner, Alex	17217 Coulter Creek Rd	Private Well	Whispering Pines10-year
W-58	Wendell Scott Development Inc.	22800 Brown Rd. Rd	Private Well	Brown Rd. Rd. 5-year
W-59	Werth, Robert	T27 R17 Sec 18 NE 1/4 of SE 1/4	Private Well	Brown Rd. 10-year
W-60	Wieneke, Richard and Karen	16430 HWY 207	Private Well	Brown Rd. 10-year
W-61	Willard, Glenn and Liz	17830 N Shore Dr	Private Well	Mt. Park 10-year
W-62	Worley Funding Company	T27 R16 Sec 13 SW 1/4 of SE 1/4	Private Well	Lk. Wen. Users 5-year
W-63	Yaskus, Michael	23210 HWY 207	Private Well	Mt. Park 10-year

Source of Information:
L = Ecology Leaking Underground Storage Tank List
U = Ecology Underground Storage Tank List
AI = Aerial Imagery
W = Ecology Well Log Database

Inventory Update Requirements

In accordance with WAC 246-290-135, the inventory list of actual and potential groundwater contaminant sources located within the delineated wellhead protection areas must be updated every two years. Inventory updates should be scheduled such that every third update is accomplished at the same time as the reevaluation of the wellhead protection area boundaries, which is required during each six-year Water System Plan update.

NOTIFICATION OF INVENTORY FINDINGS

Owners and operators of known and potential sources of groundwater contamination are required to be notified that they are located within the delineated wellhead protection areas. In addition, all water customers are required to be notified (via a billing insert) of the District's active water sources, its Wellhead Protection Program and the importance of protecting the District's sources. Regulatory agencies, local governments and emergency response agencies will also be notified of the location of the wellhead protection areas, contaminant source inventory findings, contingency plans and emergency response procedures. **Table 3** lists all of the notification recipients.

A copy of the notification letter that will be sent to owners and operators of known and potential sources of groundwater contamination located within the wellhead protection areas can be found in **Appendix O**.

Table 5-3
Notification Recipients

Agency, Business, Residence	Contact Person	Mailing Address	City, State Zip
Potential Contaminant Sources within Wellhead Protection Area			
Chelan County Public Works	Jason Detamore	316 Washington St. Ste 402	Wenatchee, Wa 98801
Land Owner	Karen Dickinson	22909 Brown Rd	Leavenworth WA 98826
B & J Timberlands Partnership	Private Well Owner	PO Box 269	Leavenworth WA 98826
Bakke, Knute	Private Well Owner	8974 East Leavenworth Rd	Leavenworth, WA 98826
Ballinger, Francie	Private Well Owner	16601 N Shore Dr	Leavenworth, WA 98826
Bass, Dan	Private Well Owner	4359 Anna Lane	Wenatchee, Wa 98801
Belcher, Donald and Judith	Private Well Owner	3819 100th Pl NE	Marysville, WA 98270
Borgens, Leslie	Private Well Owner	18416 62nd PL West	Lynnwood, WA 98057-7204
Bradley, Carrie and Jeff	Private Well Owner	6522 240th Way NE	Redmond, WA 98053
Brucker, Thomas H.S. and Booth, T. WM.	Private Well Owner	9111 SE 44th	Mercer Island, 98040
Bulmor, Rosemary	Private Well Owner	1419 Saddle Rock Dr	Wenatchee, Wa 98801
Burgess, Bill	Private Well Owner	22745 Brown Rd	Leavenworth WA 98826
Burgess, Brandon	Private Well Owner	22888 Brown Rd	Leavenworth WA 98826
Burgess, Jeff	Private Well Owner	22828 Brown Rd	Leavenworth WA 98826
Cade, L. & Sheahan, M.	Private Well Owner	625 Hillside Dr E	Seattle, WA 98112
Carson, Craig	Private Well Owner	PO Box 578	Peshastin, WA 98847
Cape, Robert	Private Well Owner	22977 SE 42nd Ct	Issaquah, WA 98029-6275
Danford, David	Private Well Owner	1211 East Boston St	Seattle, WA 98102
Dickinson, Byron	Private Well Owner	17201 N Shore Dr	Leavenworth, WA 98826
Dickinson, Kurt	Private Well Owner	22938 HWY 207	Leavenworth, WA 98826
Dickinson, Mike and 3 Rivers Investments	Private Well Owner	16925 Brown Rd	Leavenworth, WA 98826
Farr, Jim	Private Well Owner	524 205th NE	Redmond, WA 98053
Floyd, Dianne	Private Well Owner	23200 HWY 207	Leavenworth, WA 98826
Fredrickson, Stevan	Private Well Owner	22731 Brown Rd	Leavenworth, WA 98826
Friele, Robert	Private Well Owner	4283 Shore Club Dr	Mercer Island, WA 98040
Gilbertson, Dale	Private Well Owner	16541 159th Place NE	Woodinville, WA 98072
Gordon, Robert E.	Private Well Owner	14277 209th Ave NE	Woodinville, WA 98072
Gouftoth, Davel	Private Well Owner	PO Box 664	Cashmere, WA 98815
Graham, Doug	Private Well Owner	17590 N Shore Dr	Leavenworth, WA 98826
Hannon, Gary	Private Well Owner	351 19th NE	East Wenatchee, WA 98802
Hashim, John	Private Well Owner	206 Rose Point Ln	Kirkland, WA 98033
Hart, Brian	Private Well Owner	4526 47th Ave NE	Seattle, WA 98105
Hoenes, Glenn and Dejough, K.	Private Well Owner	1656 21st Ave E	Seattle, WA 98112
Hoyt, Ann K.	Private Well Owner	16181 N Shore Dr	Leavenworth, WA 98826
Landin, Earl	Private Well Owner	17515 N Shore Dr	Leavenworth, WA 98826
Large, Ron and Livingston, Marny	Private Well Owner	17680 N Shore Dr	Leavenworth, WA 98826
Lauritzen, Alan A.	Private Well Owner	19012 88th W	Edmonds, WA 98020
Ledford, Don	Private Well Owner	14107 SE 83rd St	New Castle, WA 98059

Table 5-3
Notification Recipients Continued

Agency, Business, Residence	Contact Person	Mailing Address	City, State Zip
Potential Contaminant Sources within Wellhead Protection Area			
Leitch, Jerry	Private Well Owner	7117 35th Ave NW	Seattle, WA 98117
Mastras, Dean	Private Well Owner	17325 N Shore Dr	Leavenworth, WA 98826
McLeod, John	Private Well Owner	2426 9th Ave W	Seattle, WA 98119
Morse, John W.	Private Well Owner	17679 N Shore Dr	Leavenworth, WA 98826
MRJ Construction LLC	Private Well Owner	1400 Airport Way S	Seattle, WA 98134
Nelson, Mike	Private Well Owner	17691 N Shore Dr	Leavenworth, WA 98826
Norris, Lee	Private Well Owner	3245 126th Ave NE	Bellevue, WA 98005
Okanogan-Wenatchee National Forest	Private Well Owner	215 Melody Lane	Wenatchee, Wa 98801
Paton, Kenneth W.	Private Well Owner	6385 Pioneer Ave	Cashmere, WA 98815
Peterson, Joseph	Private Well Owner	17379 N Shore Dr	Leavenworth, WA 98826
Pflugrath, Lauren	Private Well Owner	17389 N Shore Dr	Leavenworth, WA 98826
Puentes, Jorge (Oscar)	Private Well Owner	2608 W Fulton St	Seattle, WA 98199
Radach, Mr. and Mrs Jonathan	Private Well Owner	321 Peshastin St	Cashmere, WA 98815
Rose, Timothy	Private Well Owner	22515 Lk Wenatchee HWY	Leavenworth, WA 98826
Steinborn, Sydney	Private Well Owner	7936-B Seward Park Ave S	Seattle, WA 98118
Strahm, Frank	Private Well Owner	PO Box 880	Snohomish, WA 98290
Tabor, Steve and Alexandra	Private Well Owner	17640 N Shore Dr	Leavenworth, WA 98826
Two Rivers Inc.	Private Well Owner	22750 HWY 207	Leavenworth, WA 98826
U.S. Dept. of Aquiculture	Private Well Owner	301 Yakima St PO Box 811	Wenatchee, Wa 98801
Wanner, Alex	Private Well Owner	15247 Densmore Ave N	Seattle, WA 98133
Wendell Scott Development Inc.	Private Well Owner	22800 Brown Rd.	Leavenworth, WA 98826
Wieneke, Richard and Karen	Private Well Owner	13235 NE 55th Pl	Bellevue, WA 98005
Willard, Glenn and Liz	Private Well Owner	4408 30th Ave W	Seattle, WA 98199
Worley Funding Company	Private Well Owner	3032 Riviera Blvd	Malaga, WA 98828
Yaskus, Michael	Private Well Owner	1920 243rd Pl SW	Bothell, WA 98021
Regulatory Agencies and Local Governments			
U.S. Forest Service: Wenatchee River District	Vaughan Marable	600 Sherbourne	Leavenworth, WA 98826
WA State Dept. of Health	Heather Cannon	16201 E Indiana Avenue, Ste 1500	Spokane Valley, WA 99216
WA State Dept. of Ecology	Mike Schuppe	15 W Yakima Ave, Ste 200	Yakima, WA 98902-3452
Chelan Douglas Health District	Marc Marquis	200 Valley Mall Parkway	East Wenatchee, WA 98802
Chelan County Current Planning	Karen Peele	316 Washington Street, Ste 301	Wenatchee, WA 98801
Chelan County Long Range Planning	Graham Simon	316 Washington Street, Ste 301	Wenatchee, WA 98801
Emergency Response Agencies			
Chelan County Fire Protection District 9	Fire Chief	21696 Lake Wenatchee HWY	Leavenworth, WA 98826
Chelan County Sheriff	Sheriff	401 Washington St, Lower Level 1	Wenatchee, WA 98801
Lake Wenatchee Water District Customers			
All Water Customers	Varies	Varies	Varies

CONTINGENCY PLANNING

The District has developed an Emergency Response Plan for the water system. The Emergency Response Plan includes a contingency operation plan for the wells, spring and other water system facilities. The plan is included in **Chapter 6**.

PROGRAM IMPLEMENTATION AND RECOMMENDATIONS

The District's Wellhead Protection Program is an ongoing effort that requires staffing and resources to ensure its effectiveness in protecting the source of the drinking water that is supplied to its customers. As discussed previously in this document, regulations require that the District perform an inventory of all potential sources of groundwater contamination throughout the delineated wellhead protection areas every two years. In addition, DOH recommends that water systems upgrade their initial delineation using a more sophisticated groundwater flow model approach within five years of the initial delineation. At a minimum, the District must reevaluate the wellhead protection area boundaries during the Water System Plan update process, which occurs every six years.

The following tasks will be pursued as part of the District's Wellhead Protection Program.

- The District will adopt a wellhead protection ordinance that addresses permitted uses and performance standards for properties located within designated wellhead protection areas.
- Perform a more accurate delineation of the wellhead protection area boundaries utilizing analytical models, hydrogeologic mapping and computer flow models.
- Perform a more detailed inventory of potential sources of groundwater contamination.
- Confirm the locations, conditions and proper closure of abandoned private wells, especially those within one-year time of travel zones.
- Distribute the required notifications resulting from updated delineations and inventory findings.
- Develop and distribute public education materials within the wellhead protection areas to address groundwater protection and household, landscape and gardening practices that could affect groundwater quality utilizing existing information developed by DOH.
- In coordination with Chelan County, restrict land uses in the one-year time of travel zones that pose a high risk to groundwater, including gas stations, oil recycling, dry cleaners, fuel storage facilities, high-density animal keeping, high-density septic systems and golf courses.
- Develop signage at the perimeter of and at strategic locations around the wellhead protection areas to inform people that they are entering an area that contains the District's drinking water source and is vulnerable to surface activities.