

# ***WATERSHED PROTECTION PLAN***



**Olympic View Water & Sewer District**  
8128 228th Street SW  
Edmonds, Washington 98026  
Water System ID #63600

Revised April 2023  
Original 2018

Prepared By:

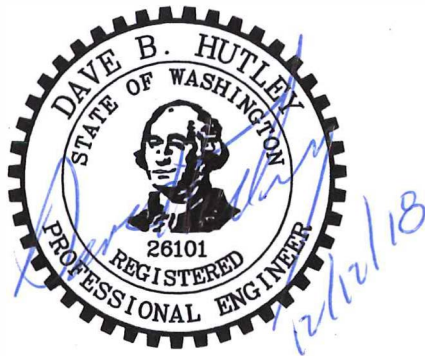


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## PROJECT CERTIFICATION

The technical material and data contained in this report was prepared by PACE Engineers, Inc., under the supervision of the below listed individuals. Those responsible staff members who are registered professional engineers are licensed in the State of Washington.



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## 1.0 EXECUTIVE SUMMARY

The Olympic View Water & Sewer District (District) is located in southwestern Snohomish County in the State of Washington and encompasses portions of the City of Edmonds, the Town of Woodway and unincorporated Snohomish County, including the communities of Esperance, Westgate, and Firdale Village.

Deer Creek, Willow Creek, Chase Lake and Chase Lake Pond, located within the District, are considered critical habitat for aquatic life and recreational use. Currently, Deer Creek is the District's surface water source. The 228th Street SW Well Field is the District's new aquifer water source and consists of two wells; one well was dug in 2014, and a second well was dug in 2016. Both wells are scheduled to begin treatment and use in 2019.

The purpose of this Watershed Protection Plan is to develop and document a program for protecting, maintaining, and improving the quality and quantity of the District's drinking water sources.

The District's current Watershed Protection Plan was completed and approved by the Washington Department of Health (DOH) in 2002 and is on file at the District. This update to the District's watershed plan is expected to supersede the 2002 plan in 2019 and is necessary due to adopted changes in land use and regulations requiring improved stormwater planning, and as part of the Deer Creek Evaluation and 228th Street SW Well projects.

The plan update also addresses the District's new well field, which the District plans to bring online in 2020. The plan update discusses the new well field source and provides a more current assessment of the Deer Creek Spring source. Robinson Noble, Inc., provided a delineation of the District's wellhead protection areas (WHPAs) for the 228th Street SW Well Field and updated the delineation and WHPAs for the Deer Creek source. The updated delineation shows that some potential contamination sources are located outside of the District's service area. This protection plan update also determines how those areas will be addressed. The Robinson Noble report is provided in Appendix B. Information provided in the delineation report is summarized in this plan update.

## 1.1 OVERVIEW

This Plan has been prepared in accordance with State Department of Health requirements (DOH 331-148) and the 1996 Safe Drinking Water Act Amendments, and incorporates elements of source water protection regulations which are outlined in WAC 246-290 Parts 2 and Part 6, Subparts A, B, C, and D. Copies of the pertinent codes are provided in Appendix A. This Plan represents a hybrid program combining the key elements of both wellhead and watershed protection planning. The reason for this approach to watershed protection is that the nature of the supply facilities and locations within an urbanized area could increase the vulnerability of the source either from surface activities or through aquifer contamination.

## 1.2 AUTHORIZATION

The Board of Commissioners of Olympic View Water & Sewer District authorized PACE Engineers, Inc., and Robinson Noble, Inc., to complete this study update as outlined in the scope of work and cost estimate. Authorization and notice to proceed were received in February 2018. This Plan update has been accomplished in accordance with the scope of work to meet the specific needs of the District and in accordance with current DOH regulations. PACE Engineers was responsible for overall coordination of the study and development of a protection program while Robinson Noble was responsible for hydrogeologic modeling and delineation of wellhead protection zones.

## 1.3 OBJECTIVES AND METHODOLOGY

In order to develop an effective program for protecting and enhancing the Deer Creek Springs and 228th Street SW Well Field, expected to be online in 2020, supply sources, the zone of contribution, and wellhead protection areas for one-, five-, and ten-year capture zones were first identified by Robinson Noble, as documented later in this report and in their full report provided in the appendices. Once the zone of contribution for both sources was identified, an inventory of land uses and potential contaminants within the zones was prepared and compared with District billing records for verification. The inventory of potential contaminants is provided in Table 2, Section 5 of this plan. After determining the types of activities and potential threats to water quality, a program for the protection of both water sources was identified. This program includes recommended capital improvement projects that may be appropriate for protection of the source supplies, as well as precautionary measures which might be implemented by agencies responsible for land use code enforcement within the area of influence. A last step in developing this Plan was to formulate a contingency plan in the event of source water contamination and provide recommendations regarding continued coordination with the Town of Woodway, City of Edmonds, the City of Shoreline and Snohomish County for the long-term protection and enhancement of the District's water supply.



## 2.0 WATER SYSTEM OVERVIEW

Although a complete inventory of the Olympic View Water & Sewer District water system is provided in the District's 2016 Water System Plan, the following summary is intended to provide the reader with a general understanding of how the water system works, especially the significance of the Deer Creek source and 228th Street SW Well Field source, in the District's overall objective of providing high quality, safe, and reliable domestic water and fire protection service to its customers<sup>1</sup>.

### 2.1 SERVICE AREA

Olympic View Water & Sewer District's water service area is located in the Cedar-Sammamish Watershed, also known as Water Resource Inventory Area 8 (WRIA 8) and includes approximately 2,430 acres of land in the southwestern corner of Snohomish County. The service area is generally bounded on the south by the King/Snohomish County line at 244th Street SW, on the north by 220th Street SW, on the east by Highway 99, and on the west by the Puget Sound. Water service is provided to approximately 15,000 people through approximately 4,787 water service connections (6,530 Equivalent Residential Units or ERUs) within the Town of Woodway, a portion of the City of Edmonds, and some areas within unincorporated Snohomish County. The service area is primarily single-family residential and associated facilities, with multi-family and commercial uses concentrated along major thoroughfares such as Highway 99 and Edmonds Way (SR 104). The former Chevron petroleum storage facility located in the southwestern corner of the District at Point Wells is the only major industrial facility within the District's service area.

### 2.2 WATER SYSTEM DEMANDS

The majority of the water use in the District is for single-family land use (about 65 percent) with commercial and industrial use and multi-family use of about 30 percent. The average day demand over the past five years (2013 – 2017) was approximately 1.24 MGD, while the highest peak day demand over a three-day period was approximately 6.65 MGD. Average use per single-family residence is approximately 294 gallons per day. A mixed-use development referred to as "BSRE Point Wells" is proposed for the 61-acre Point Wells parcel. Permits are currently under review at Snohomish County. The proposed development would add up to 3,000 residential units, 250,000 square feet of commercial/retail space, and 800 jobs to the area. This type and scale of development would have an impact on the District's water system.

### 2.3 WATER SYSTEM FACILITIES

Olympic View Water & Sewer District's water system consists of three primary pressure zones and secondary or "sub-zones." The District maintains two separate sources of continuous supply, four emergency intertie connections, three reservoirs, three booster pump stations, and

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<sup>1</sup> Source: Olympic View Water & Sewer District 2016 Water System Plan

several pressure control stations to control pressures and allow for inerties between pressure zones. An overview of primary system facilities is provided below and shown on Figure 2.

### 2.3.1 Source of Supply

Olympic View Water & Sewer District's water supply has traditionally been obtained from a combination of sources including District-owned and operated water source facilities and water purchased from the City of Seattle's regional water supply system. A summary of these facilities is presented below:

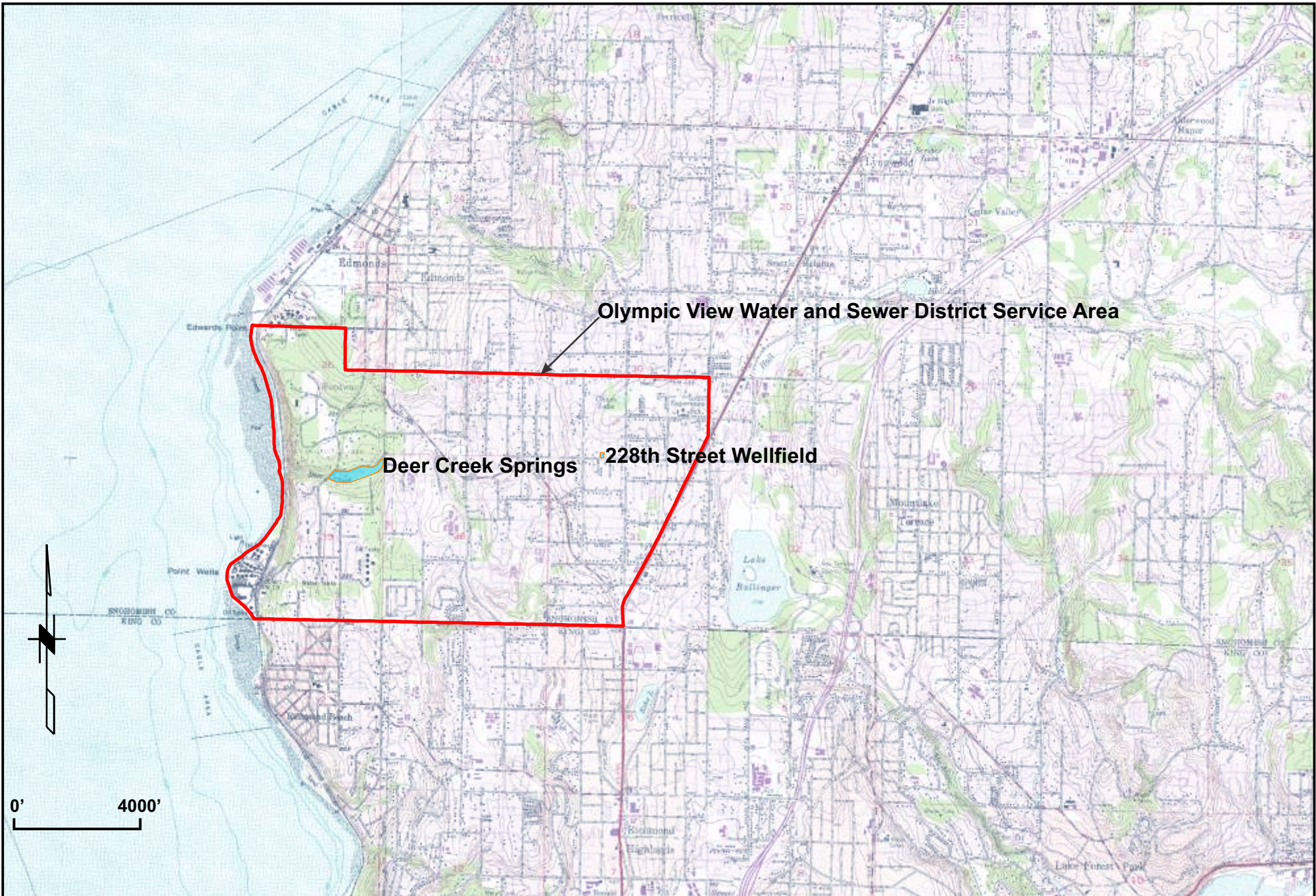
#### Deer Creek Springs Source

The Deer Creek source is a spring-fed stream source, classified as a surface water source, located in the western portion of the District that produces about 40 percent of the District's water supply. Although the Deer Creek source has been active for a number of years, a new 700-gpm direct filtration water treatment facility was constructed in 1998 with the intention of producing approximately 1 mgd (million gallons per day). An average annual production of 0.52 mgd is currently drawn from this source. Clearwell pumps provide transmission of the treated source water to the Woodway Reservoir.

The District has conducted an evaluation of the treatment plant and Woodway Tank. It has been 20 years since the plant was built and many components are nearing the end of their useful lives. The District plans to replace the pumps with variable frequency drive pumps to increase efficiencies and decrease power costs. All chemical feed systems are being evaluated and replaced with more efficient pumps and storage systems. The Woodway Tank is being updated with new electrical systems to support the current needs. Some safety issues, such as location of electrical controls and access to support systems are being evaluated and updated as needed. A new roof and supporting electrical systems may also be updated as needed based on evaluations at the time of construction.

Typically, the Deer Creek source supplies all of the Woodway Zone in the western portion of the District. Each year the Deer Creek plant is shut down for cleaning and maintenance purposes. During this time the Woodway Zone receives supply from the south through Seattle Public Utilities (SPU) source meters. Under normal operating conditions, Deer Creek water is transferred to the District's Low Zone through the Woodway Booster Station.

The Deer Creek Watershed area consists of approximately 20 acres of land located in a ravine near the western edge of the District. The watershed area is owned by the District and completely fenced for security, and District staff are on call 24 hours a day for response to any type of emergency conditions at the water treatment facility or within the watershed. Aside from water supply facilities, the watershed area remains in a natural wooded state for protection.



Olympic View Water and Sewer District Service Area

Deer Creek Springs 228th Street Wellfield



Note: Basemap from  
USGS Edmonds  
West and East  
Quadrangles

PM: MTW  
August 2018  
1686-007A

Snohomish County  
T 27 N/R 3,4 E  
Scale 1" = 4000'

Figure 1

Vicinity Map with Service Area

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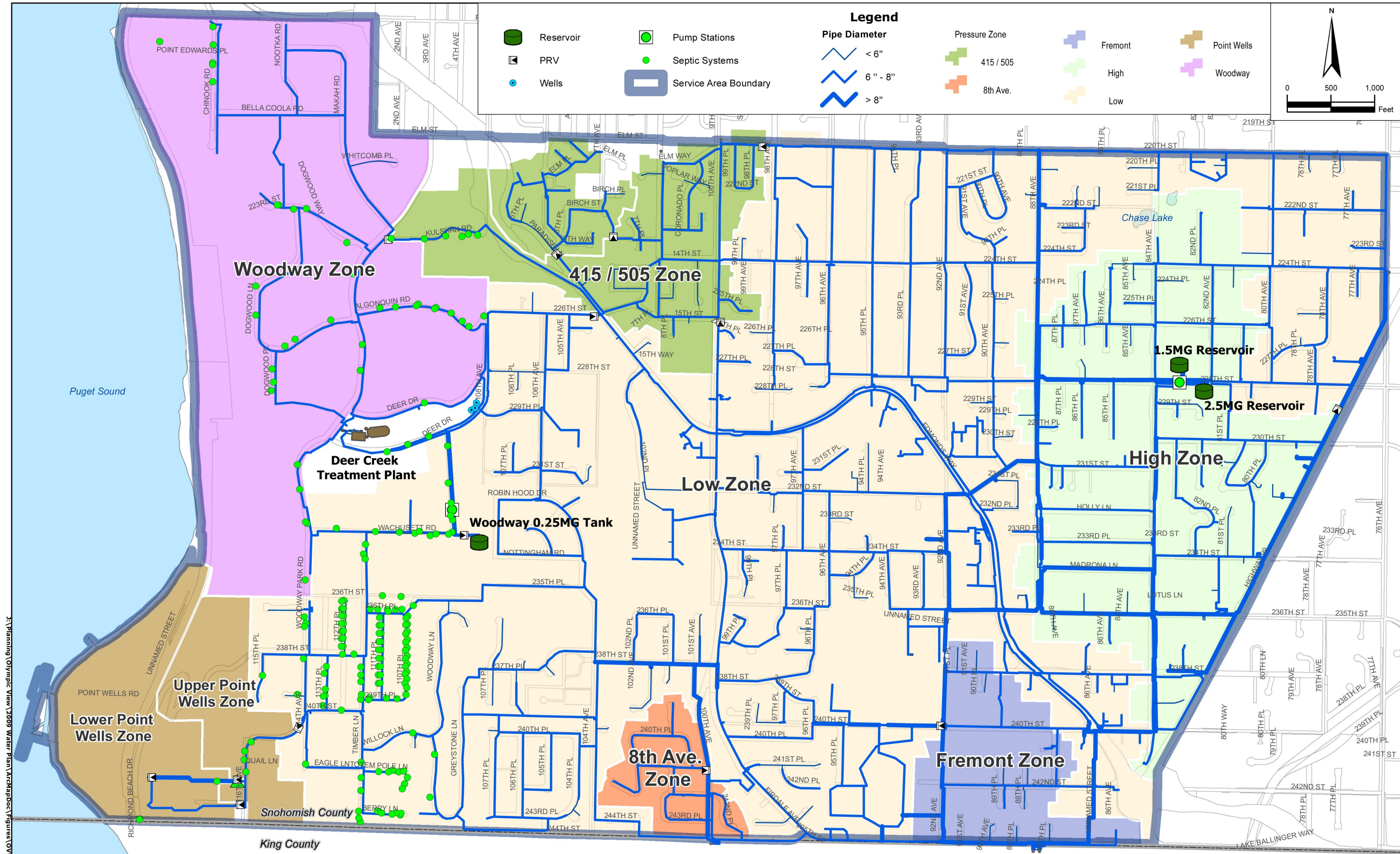


Figure 2  
Existing Water System Map

J:\Planning\Olympic View\2009 Water Plan\ArchAppDoc\Figures\OVWD Figure 3-1.MXD



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#### City of Seattle Public Utilities (SPU) Source

The District purchases the majority of its water supply (approximately 60 percent) from SPU through three separate metered connections along the southern boundary of the District. All three meters from the Seattle system are from Seattle's 580 Zone, are equipped with flow controllers, and flow into the District's Low Zone (540 hydraulic grade line) to supply the District's 1.5-million-gallon reservoir by gravity.

Water is conveyed from the SPU system to the District's supply metering stations through 24-inch and 20-inch transmission mains. Two supply metering facilities are located on North 205th Street, one near the intersection of 8th Avenue North which supplies the 8th Ave Zone (590 hydraulic grade line), and one located near Fremont Avenue North, which supplies the District's Fremont Zone and the Low Zone (540 hydraulic grade line). These two metering stations have a combined theoretical capacity of approximately 4,500 gpm and are equipped with flow controllers.

The third SPU supply metering station is located further west, also near the southern District Boundary, and backs up supply to existing customers of the Woodway Zone and potential future customers of the southwestern portion of the District. The 8-inch meter was installed in 2011 and has a theoretical supply capacity of 2,500 gpm; however, actual capacity would be more on the order of 2,000 gpm, based on the hydraulic conditions of SPU's supply system in that area.

All three SPU supply stations are monitored and controlled by the District's Supervisory Control and Data Acquisition system (SCADA).

The City of Seattle source is capable of meeting the needs of the entire District in the event that the Deer Creek source is out of service or unavailable.

#### 228th Street SW Well Field

In 2014 the District began drilling and testing for a new well located at 8605 228th Street SW. The original test well indicated the presence of ammonia at a level of 600 feet. Therefore, the lower section of the well was sealed and better quality water was located in the shallower aquifer at 290 feet. Production was tested at just over 100 gpm. After evaluation of the options, it was determined that a second well could be placed on the same site, thereby increasing the production to 150 gpm. In 2017 a second well was successfully drilled and tested, with production being 250 gpm at a depth of 290 feet. The total projected supply from the well field is 350 gpm. The District is proceeding with the design and construction of a water treatment plant at the site. Treatment and use of the well is scheduled for 2020.

#### Emergency Interties

Four emergency supply interties with the City of Edmonds provide the District with a backup supply in the event of an interruption in the Seattle supply. Three of these interties are able to supply water from Edmonds to the District. One is a metered connection that was constructed for the sole purpose of delivering Everett water to the District via the Alderwood Water and Wastewater District and City of Edmonds water

systems. Although it is possible for the District to serve the majority of its service area through this intertie with Edmonds, no formal intertie agreements exist.

### Storage Facilities

There are three storage reservoirs in the District system: the 0.25 million-gallon Woodway Tank which serves the Woodway Zone; the 1.5-million-gallon reservoir used to transfer water received to the High and Low Zones; and the 2.5-million-gallon reservoir which provides direct service to the Low Zone. Water from any of the facilities has the capability of reaching any other reservoir. This interconnection between pressure zones provides a safety measure in the event of an extremely high demand in one zone and allows the District flexibility in maximizing the use of its sources.

### **2.3.2 Pump Stations**

There are four separate pump station facilities serving the District that transfer water from the existing sources of supply and throughout the District's pressure zones. Water supply from the Seattle meters flows by gravity into the District's Low Zone (hydraulic grade 540 feet) and to the 1.5-million-gallon storage tank (overflow elevation 520 feet). Water is pumped from the 1.5-million-gallon tank through the 228th Street Booster Station to the 2.5-million-gallon standpipe (overflow elevation 586 feet). Water from this reservoir can either flow through a pressure-reducing valve back into the Low Zone or be pumped through the High Zone Booster Pumps to supply the High Zone at its hydraulic grade elevation of approximately 612 feet. This interconnection of pressure zones and storage reservoirs allows flexibility in zone supply and provides backup storage between the High and Low Zones.

Water is pumped from the Deer Creek supply source into the Woodway storage tank (overflow elevation 353 feet) and provides the Woodway Zone with its primary source of supply. Water from the Low Zone can also flow through pressure-reducing valves into the Woodway Zone to substitute Seattle water as an alternate source. Water can also be pumped through the Woodway Booster Station to transfer Deer Creek water to the Low and High Zones. Table 1 summarizes the pump station locations. Detailed information is available in the District's 2016 Water System Plan.



<b>Table 1: Water System Pump Stations</b>			
<b>Station</b>	<b>Locations</b>	<b>Last Pump Upgrade</b>	<b>Zone Served</b>
High Zone Boosters	8303 228th Street SW Pumphouse	1994	High Zone
Transfer Pumps	8303 228th Street SW	1988	Low Zone
Woodway Boosters	23315 Wachusett Road (200' east of bend in Wachusett Road)	1984	Woodway to Low Zone
Deer Creek Clearwell Pumps	Deer Creek Treatment Plant Clearwell	1998	Woodway Tank

### 2.3.3 Transmission and Distribution System

The Olympic View Water & Sewer District system consists of a network of approximately 50 miles of pipe ranging from 2- to 12-inches in diameter within three primary pressure zones (High, Low, and Woodway), and four secondary pressure zones (405-515, Upper/Lower Point Wells, Fremont, and 8th Avenue) that maintain pressures in the desired range of 40 to 90 psi.

Once developed, the Point Wells property will also require an additional pressure zone because of its low elevation in relation to the rest of the District. Pressure reduction and control throughout the District is maintained by a series of pressure-reducing, pressure-sustaining, and flow control valves.

Under very specific and rare circumstances, SPU well water could potentially enter into the District distribution system. This occurrence would require that the Tolt source be out of service, in which case the District would receive water from the SPU Cedar River source. This occurrence would also require that the SPU Highline Well Field be online supplementing the Cedar River source.

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### **3.0 SOURCE SUSCEPTIBILITY ASSESSMENT**

This section provides information on the source susceptibility for both water sources. DOH reviews Source Susceptibility Assessment Forms for the establishment of testing programs for water systems.

#### **3.1 DEER CREEK SOURCE**

The State Department of Health reviewed the Source Susceptibility Assessment Form for the Deer Creek Springs source in 1996. The susceptibility analysis included review of a variety of geologic and land use factors which combine to indicate the vulnerability of and potential severity of certain pollutants entering the water source. The purpose of the assessment was to determine the appropriate level of testing required to ensure that the water source remains free of contaminants. Once reviewed, DOH assigned the Deer Creek source a high susceptibility rating and established a testing program appropriate to the source characteristics. The testing program remains unchanged and requires testing that includes periodic analysis for Volatile Organic Compounds (VOCs). Based on the Susceptibility Assessment and regional conditions, the District received a waiver for Synthetic Organic Compound (SOC) monitoring. The waiver is still valid.

#### **3.2 228TH STREET SW WELL FIELD**

A Source Susceptibility Assessment Form will be completed and sent to the State Department of Health for review once the 228th Street SW Well Field source is online and operational.

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## 4.0 WELLHEAD PROTECTION AREAS (WHPAS)

The WHPAs for both the Deer Creek Springs and the 228th Street SW Well Field sources were delineated using a numerical groundwater model that was specifically developed for the study area. That information was used to develop the protection plan and is summarized below. Because there was a reasonably sufficient amount of geologic and hydrogeologic data available for the study area, a modeling approach for WHPA delineation was deemed to be a more accurate and more appropriate approach.

DOH requires that each source have three designated WHPAs, labeled Zone 1, Zone 2, and Zone 3, based respectively on the one-year, five-year, and ten-year time-of-travel capture zones. Per DOH guidance (DOH, 2010), Zone 1 (the one-year capture zone) should also include a six-month capture zone to focus greater protection on potential viral and microbial contamination that may pose a higher risk to the drinking water supply. As described in the Robinson Noble report, buffer zones which incorporate the entirety of the defined capture zones for both the 228th SW Well Field and Deer Creek Spring sources are included with the WHPAs for each source. Model development and calibration and WHPA delineation are described in detail in Section 2 of the Robinson Noble Report provided in Appendix B.

The approximate study area for the Deer Creek source was the District service area and a portion of the surrounding area extending east to Hall Creek. The zone of potential contamination extends outside of the District's service area and into the City of Shoreline to the southeast and the City of Edmonds to the northeast.

### 4.1 DEER CREEK SOURCE

As documented in Appendix B of this plan, Robinson Noble, Inc., completed a detailed and thorough analysis of the Deer Creek source in July 2018 to identify wellhead protection areas. First, an analysis of geologic and hydrogeologic data for the region was conducted. Second, Robinson Noble developed a conceptual model of the hydrogeologic system from which the spring produces water. Third, the data analysis and conceptual model were combined with flow data from the springs and field verification of conditions to develop a numeric model which reflects the recharge and flow characteristics of the shallow groundwater system model. Using the numeric model, wellhead protection zones based on groundwater travel rates were developed.

### 4.2 228TH STREET SW WELL FIELD

Also documented in the Robinson Noble report provided in Appendix B is a detailed and thorough analysis of the District's new 228th Street SW groundwater well, scheduled to go online in 2019. The analysis also includes collection and analysis of geologic and hydrogeologic data for the region. Similar to the Deer Creek source, the zone of potential contamination for the well field extends outside of the District's service area into the City of Edmonds in a northeasterly direction. See Figure 4.

Robinson Noble also developed a conceptual model of the hydrogeologic system from which the well produces water. As with the Deer Creek source, the data analysis and conceptual model were combined with flow data from the well and field verification of conditions to develop a numeric model which reflects the recharge and flow characteristics of the shallow groundwater system model. Using the numeric model, wellhead protection zones based on groundwater travel rates were developed.

A summary of each of the steps taken for analysis of both sources is provided below while detailed information is provided in the Robinson Noble report contained in Appendix B.

### **4.3 DATA COLLECTION AND DATABASE DEVELOPMENT**

In addition to pertinent studies performed for other geologic and hydrogeologic projects in the vicinity of the District's water sources, Robinson Noble researched well records within the study area to create a water well database. Robinson Noble estimate that the Ecology database contains approximately 1,200 well reports (well logs) for the study area. These logs were first screened for reliability, and then reliable logs were utilized for a variety of model input information (i.e., aquifer elevation, water levels for calibration, etc.). In addition, information from test holes and observation wells in and around the watershed area and other information from Robinson Noble files was included in the database.

Robinson Noble also utilized several other miscellaneous sources to support model development. Between 2004 and 2010, in conjunction with the Brightwater sewer tunnel construction, Robinson Noble conducted extensive groundwater monitoring at both the Deer Creek Springs site and the original shop well (located near the current 228th Street SW Well Field). Hydrographs created during this monitoring were used for final model calibration, and precipitation data collected during the monitoring effort were used to evaluate the modeled recharge values.

### **4.4 CONCEPTUAL MODEL**

Development of a conceptual model is an important step in developing an overall understanding of groundwater flow in an area and for organizing field data for further analysis. Development of the conceptual model for the District's water sources included delineation of boundaries for the model, identification of hydrostratigraphic units within the established boundaries and determination of the general groundwater flow characteristics. The model boundaries are generally limited to physical and hydraulic features which impede the flow of groundwater.

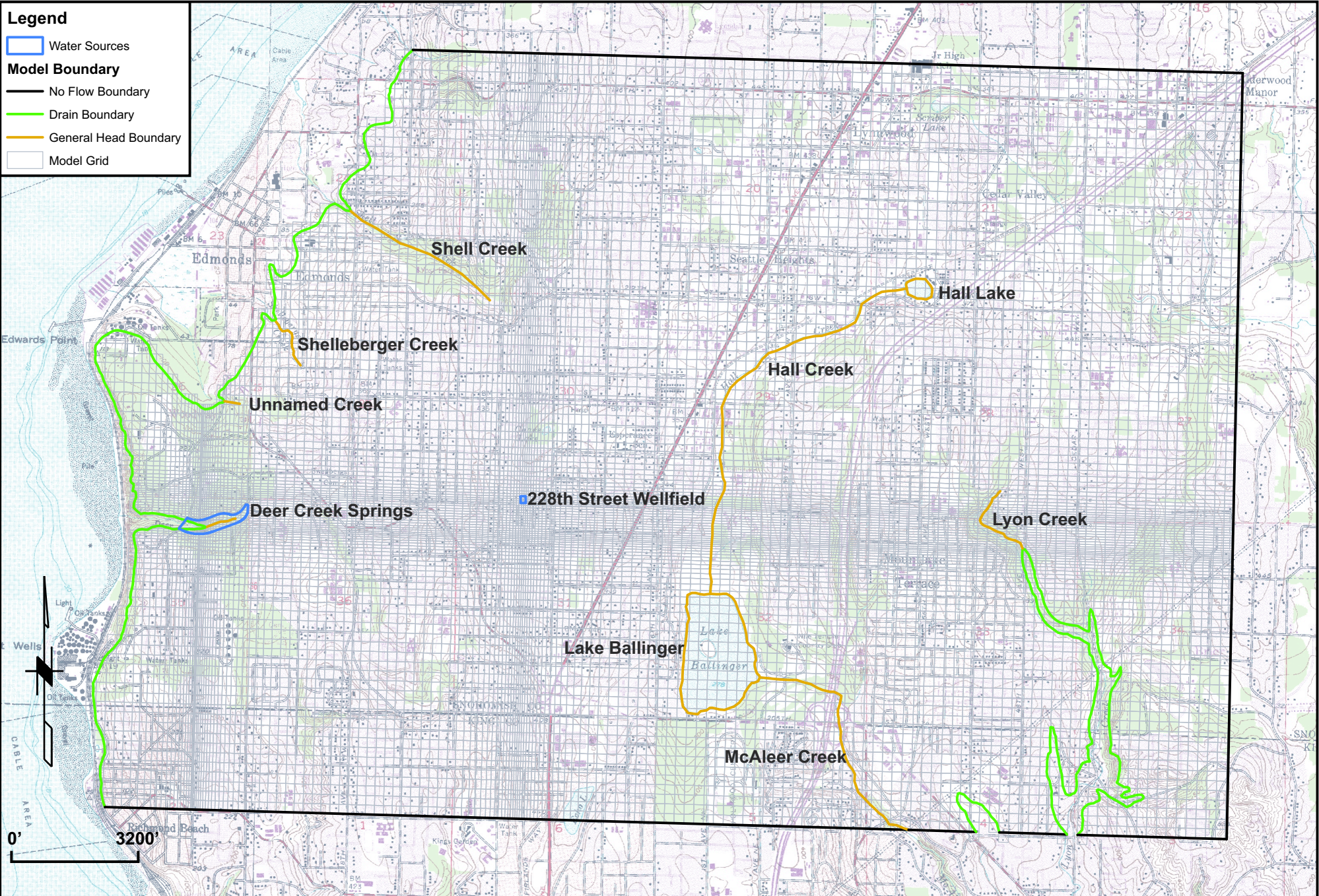
The boundaries outlined for the study area are the bluff overlooking the Puget Sound on the west and a groundwater divide located approximately one-half mile west of Lake Ballinger in the eastern portion of the study area (See Figure 3<sup>2</sup>). No groundwater influence is believed to be present from the north or south of the Deer Creek Springs or well field. Additional information on the model boundaries is provided in the Robinson Noble Report in Appendix B.

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<sup>2</sup> Robinson Noble 2018 Wellhead Protection Areas, Figure 4 Model Boundaries

**Legend**

- Water Sources
- Model Boundary**
- No Flow Boundary
- Drain Boundary
- General Head Boundary
- Model Grid



Note: Basemap from  
USGS Edmonds  
West and East  
Quadrangles

PM: MTW  
August 2018  
1686-007A

Snohomish County  
T 27 N/R 3,4 E  
Scale 1" = 3200'

Figure 3  
Model Boundaries

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Definition of hydrostratigraphic units was accomplished in part by identifying surficial geology, which in the vicinity of the watershed are in general conformance. A complete discussion of these factors is provided in the Robinson Noble report in Appendix B. Primary hydrostratigraphic units in the study area include Vashon Till on the surface, underlain by Vashon Advance Aquifer System and Pre-Vashon transitional beds underlying the advance aquifer system.

The final and most important element of the conceptual model is identifying the general flow patterns or how groundwater moves through the study area and discharges from the springs. Identification of this element requires analysis of a variety of information including precipitation and recharge data, head and hydrograph data, well production data and other pertinent hydrogeologic data. This analysis found that the general flow of groundwater in the area of the Deer Creek Springs is from east to west and is rapid due to the relative high permeability of Vashon advance outwash sediments and low permeability of the underlying silt and clay transition systems on which the aquifer system rests. The conceptual model indicates that the source of recharge for the groundwater system is direct recharge from precipitation and where streams lose water through infiltration into the ground. Discharge from the groundwater system is through the bluff over the Puget Sound but is particularly focused at the ravine in which the Deer Creek Springs are located.

#### **4.5 CAPTURE ZONES**

Delineation of capture zones is required prior to determination of Wellhead Protection Areas (WHPAs).

The capture zones for both the 228th Street SW Well Field and the Deer Creek Springs sources were delineated using a steady state numerical groundwater model that was specifically developed for the study area. Because there is a reasonably sufficient amount of geologic and hydrogeologic data available for the study area, Robinson Noble used a modeling approach for delineation, which is deemed to be more accurate (and more appropriate) than the standard calculated-fixed radius (CFR) method. Model development and calibration and capture zone/WHPA delineation are described in Section 2 of the Robinson Noble report provided in Appendix B.

Time related capture zones (WHPAs) are determined by calculating the velocity of water flowing through the groundwater system. As stated in the Robinson Noble Report contained in Appendix B, the travel time identified for each time-related capture zone (6 months, 1-year, 5-year, 10-year) represents the time it takes for a particle of water to move along the flow paths. It is noted that the time for a particle of contaminant to travel through the same flow path may significantly differ from the estimated time that it takes for a particle of water to travel the same course. Through numeric modeling, Robinson Noble has identified travel time capture zones for the Deer Creek source, which are reflected in Figure 4.

#### 4.6 WELLHEAD PROTECTION AREAS (WHPAS)

Determination of WHPAs, in accordance with State Department of Health requirements, requires consideration of the following five zones in the development of a wellhead protection zone: Sanitary control area (defined protection radius around a wellhead or spring; typically 100 foot radius); Zone 1 (one-year horizontal time of travel zone with an additional six-month time of travel zone); Zone 2 (five-year horizontal time of travel zone); Zone 3 (ten-year horizontal time of travel zone); and an additional buffer zone. These zones correspond with the time of travel zones established by numeric modeling as shown in Figure 4.

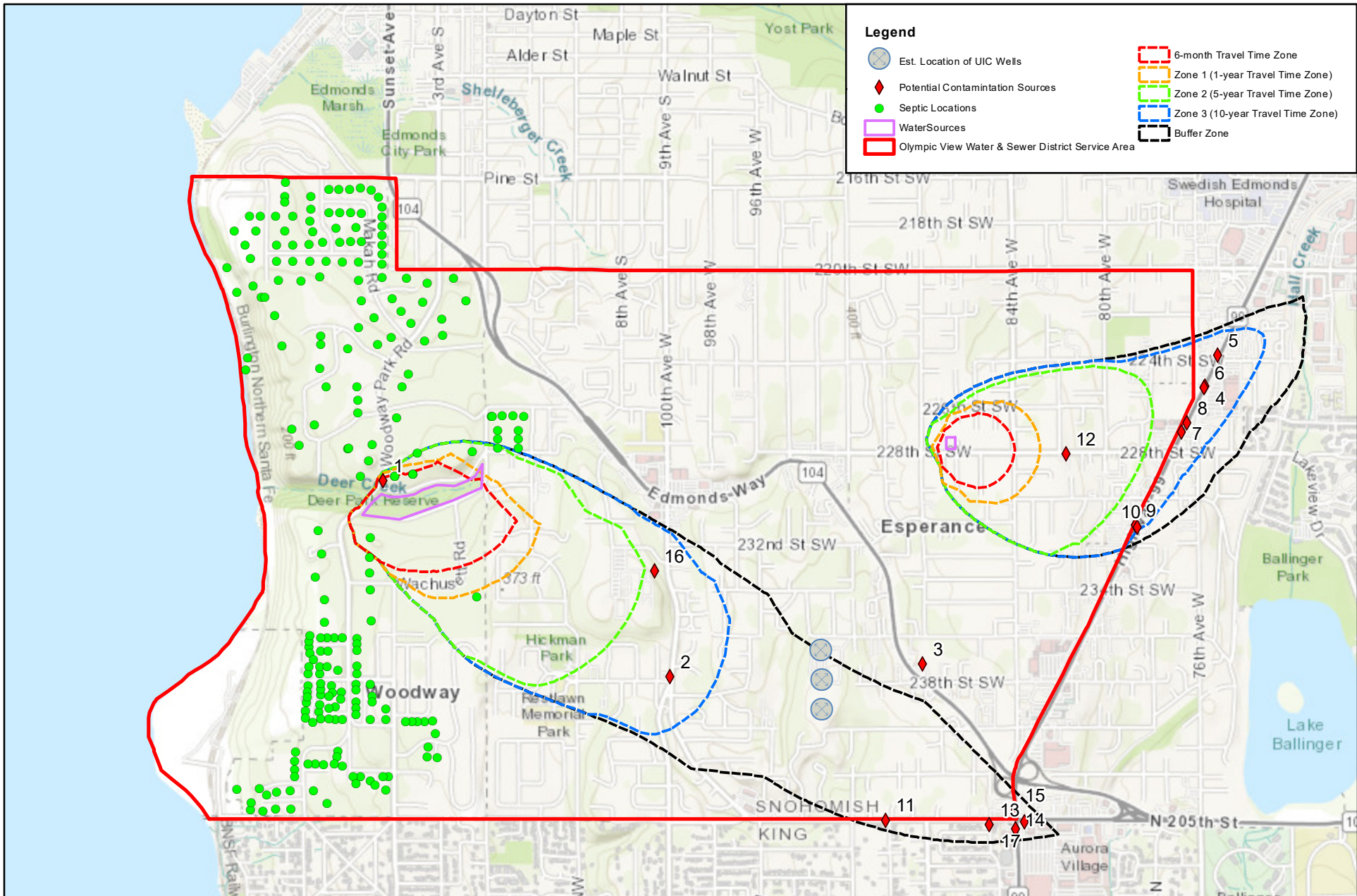
The first four of these zones are required components of a protection plan and define areas requiring differing levels of response to a contamination event based on the expected time of travel to a given groundwater source. The buffer zone is considered optional but is often vital in planning for comprehensive protection of the supply sources (DOH, 2010). These specific WHPAs, including buffer zones, were delineated by Robinson Noble for the 228th Street SW Well Field and the Deer Creek Springs sources and are presented in Figure 7 of the report in Appendix B.

The Wellhead Protection Areas for the Deer Creek and well field sources were determined by using a calibrated groundwater model. WHPAs were delineated for the 228th Street SW Well Field and Deer Creek Springs sources using a particle-tracking post-processing program.

The WHPAs for the 228th Street SW Well Field were delineated using a simulated withdrawal rate of 500 gallons per minute (gpm), which is the full instantaneous quantity allocated by the District's current water right. The current allocated annual quantity for the water right is 560-acre feet/year, so the well field can feasibly only be pumped at a maximum continuous rate of 347 gpm without exceeding the allocated annual quantity. However, there are only minimal differences between the WHPAs delineated using a rate of 347 gpm and those delineated using a rate of 500 gpm. Delineation at the higher rate results in slightly larger, more conservative WHPAs for the well field, which is intended to cover all conceivable pumping conditions.

Particles were introduced at the 228th Street SW Well Field and Deer Creek Springs, and then tracked up-gradient for specified time intervals. Particle tracking at both sources was conducted for six-month, one-year, five-year, and ten-year intervals. Additional particle tracking was also conducted using the "to beginning" option in the program to track the particles to their ultimate origin within the model. This allowed delineation of the entire zone of contribution for the two sources. The program was then used to convert the particle tracks to specific time-of-travel capture zones (see Section 2.1 of the Robinson Noble report) for the two sources. Figure 7 in Appendix B presents the time-of-travel capture zones (WHPAs) that were delineated for the two sources. In addition to the standard six-month, one-year, five-year, and ten-year WHPAs, the capture zones that were calculated for the entire zone of contribution for each of the two sources were used to define the recommended buffer zones.

An additional buffer zone has been recommended to account for the relatively shallow nature of the groundwater system and includes the entire zone of contribution for the Springs.



## Wellhead Protection Areas Map

Figure 4

0 0.125 0.25 0.5 Miles



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## 5.0 CONTAMINANT SOURCE INVENTORY

In an attempt to identify the susceptibility of the source to potential contaminants, a survey of land uses in the area of contribution has been accomplished. This effort was completed using District billing records as well as land use maps and other information from the City of Edmonds, Snohomish County and Town of Woodway, within which Olympic View Water & Sewer District serves. This inventory is essential in identifying known potential risks to the watershed area. It is the intent of this Plan that the list of potential contaminants be provided to local regulatory agencies in order to assist in long term protection of the watershed by appropriate environmental protection legislation. Table 2 and Figure 4 in this section outline the identified potential contaminants within the Wellhead Protection Areas according to location within each time capture zone for each source.

Figure 4 also provides a general map of known on-site sewage disposal systems in the vicinity of the watershed area, although the names and addresses of individual property owners have not been identified as part of this study. The Plan was, however, distributed to local agencies, Woodway, Edmonds, and Snohomish County for use in consideration of future activities related to the existing septic systems. In addition, implementation of this Plan includes notification of all property owners within the capture and buffer zones to inform them of their role and responsibilities in protection of the watershed. Figure 5 indicates general land use within the District to provide an overview of which areas of the District have the potential to support activities which might include hazardous materials.

An additional area of concern in the immediate vicinity of the watershed is the storm drainage system which surrounds the watershed itself. Although adequate storm facilities exist on the east and south sides of the watershed, improvements are needed along the northern edge of the area. Catch basin relocation and installation of curb and gutter are anticipated and will be coordinated with the Town of Woodway for protection of the area from runoff from the pavement above the watershed.

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**TABLE 2 - POTENTIAL CONTAMINANT INVENTORY**

	Facility Name/Address	Type of Use	Priority	Reason	Capture Zone	Contact Address/Phone
1	Deer Creek Water Treatment Plant 23003 Woodway Park Rd (In watershed)	Water Treatment Facility	Low Downstream of source	Potassium Permanganate Calcium Hypochlorite Sodium Hypochlorite Aluminum Sulfate	1 Year	8128 228th St. SW, Edmonds, WA (425) 774-7769
2	Woodway Gas & Mart 23726 100th Ave W, Edmonds, WA	Gas Station/Closed	Moderate	Fuel USTs	Buffer	701 5th Ave, Ste. 7100, Seattle, WA
3	Olympic View Water and Sewer District 23725 Edmonds Way	Stormwater, Oil & Water Separator	Moderate	USTs	Buffer	8128 228th St. SW, Edmonds, WA (425) 774-7769
4	Kmart 4208 22511 Hwy 99, Edmonds, WA	Sales	High	Emergency/Haz Chem Rpt Tier 2	10 Year	15015 Main St., Ste 203 Bellevue, WA (866) 562-7848
5	Gasoline Alley 174 22324 HWY 99, Edmonds, WA	Service Station	High	Gasoline Underground Storage	10 Year	11115 Kulshan Rd, Woodway, WA (425) 778-4304
6	Rite Aid #5183 22515 HWY 99, Edmonds, WA	Drug Store	High	Hazardous Waste Generator	10 Year	22515 HWY 99, Edmonds, WA (425) 670-2667
7	Kenyon Printing Company 22618 HWY 99, Edmonds, WA	Printing	High	UST/Toxics	10 Year	3882 Steilacoom Blvd, Lakewood, WA (253) 582-4400
8	Edmonds Usave Mini Mart 22625 HWY 99, W, Edmonds, WA	Fuel Sales	High	UST/Toxics, LUST, State Cleanup Site/Toxics	10 Year	7180 Koll Center Pky, Pleasanton, CA (925) 884-0800
9	Dollar Rent a Car 23122 HWY 99, Edmonds, WA	Car Rental	High	UST/Toxics	10 Year	23122 HWY 99, Edmonds, WA
10	99 Body Shop 23125A HWY 99, Edmonds, WA	Car Repair	High	UST/Toxics, LUST/Toxics	10 Year	914 9th Ave N, Edmonds, WA
11	Snohomish County PUD 1 Richmond Park Substation 9005 244th St SW, Edmonds, WA	Electric Utility	High	Emergency/Haz Chem Rpt Tier 2	Buffer	2320 California, Everett, WA (425) 783-1000
12	Olympic View Water and Sewer District, Headquarters Project	Utilities	High	Emergency/Haz Chem Rpt TIER 2	5 year	8128 228th St. SW, Edmonds, WA (425) 774-7769
13	Foushee Associates 20408 Whitman Ave N, Shoreline, WA		Moderate	Haz Waste Management Activity	Buffer	3260 118th Ave SE, Bellevue, WA (425) 746-1000
14	Aurora Village 76 20409 Aurora Ave N, Seattle, WA	Gas Station	Moderate	State Cleanup Site/Toxics	Buffer	20409 Aurora Ave N, Seattle, WA (206) 542-1250
15	Campbell Nelson VW SAAB 24329 HWY 99, Edmonds, WA	Car Sales	Moderate	UST, Emergency/Haz Chem Rpt TIER 2	Buffer	24329 HWY 99, Edmonds, WA (425) 778-1131
16	Madrona School 23200 100th St. W Edmonds, WA	School	High	UICs	Buffer	23200 100th St. SW, Edmonds, WA (425) 431-7000
17	Home Depot 4707 1335 N 205th St	Sales	High	Hazardous Waste Generator	Buffer	1335 N 205th St, Shoreline, WA

**NOTE: Potential Contaminants are indicated on Figure 4 and correlated with numbering shown above.**

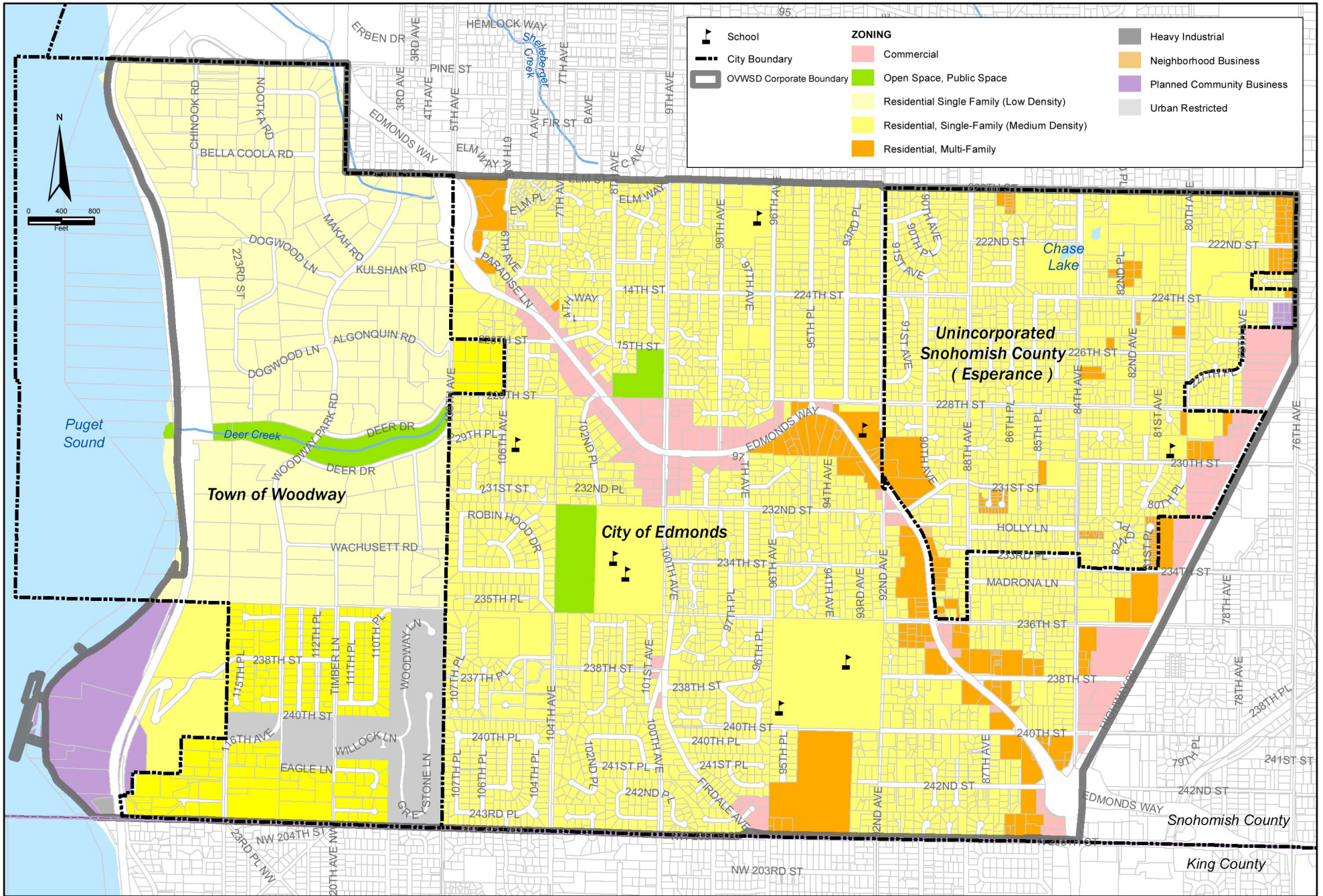


Figure 5  
Zoning



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## 6.0 CONCLUSIONS AND IMPLEMENTATION

Based on the hydrogeologic and land use analyses developed as part of this Watershed Protection Plan, it is concluded that the District's Deer Creek and well field sources are generally well protected from potential contamination and that a very high level of source reliability is provided by the District's multiple sources of water. However, as discussed previously, there are a variety of potential contaminant sources within the identified capture zones and a specific program for long term protection of the Deer Creek source is required. The District's program should include the below listed elements, each of which is discussed in further detail later in this Section.

- Establish Watershed Protection Guidelines (Appendix C)
- Capital Improvements for increased protection of watershed
- Coordination with local Emergency Response Teams and Police
- Coordination with Local Land Use Authorities (Town of Woodway, City of Edmonds, Snohomish County)
- Notification of potential contaminant sources
- General Public Awareness program
- Continued monitoring

### 6.1 ESTABLISH WATERSHED PROTECTION GUIDELINES

Water Supply Protection Guidelines, as presented in Appendix C are key to all other aspects of the Watershed Protection Plan. They provide the District and other agencies with a summary of the kinds of activities which could have a short or long-term impact on the Deer Creek Watershed and subsequently impact how The District maintains high quality drinking water service to its customers.

### 6.2 CAPITAL IMPROVEMENTS

Certain capital improvements are or may be required for continued protection of the watershed. At this time, modification of stormwater facilities on the north side of the watershed will be included as a Capital Improvement project and will be added to the Water System Plan as needed, to insure that stormwater flows are properly intercepted and are not allowed to flow into the watershed area. It is recommended that the District proceed with a design of storm water system improvements. Additional capital improvements projects, which may be required for watershed protection, will be identified and accomplished as required and included in the District's periodic water system planning efforts.

### **6.3 OTHER EMERGENCY RESPONSE PROGRAMS**

Olympic View Water & Sewer District operates within the limits of Edmonds, Woodway, and Snohomish County. As such, any of these agencies may become aware of activities or situations which could impact the watershed prior to The District's knowledge. Continued coordination with these agencies and maintenance of notification procedures is required and will be accomplished by District representatives remaining in close contact with these agencies.

### **6.4 COOPERATION WITH LOCAL LAND USE AUTHORITIES**

Implementation of the Supply Source Protection Plan requires cooperation with other agencies as well as notification of the owners and operators of facilities or operations which pose a potential threat to the integrity of the watershed. Initial coordination with the Town of Woodway, the City of Edmonds, and Snohomish County has been accomplished by providing a copy of this Plan and the District's Water Supply Protection Guidelines (Appendix C) for comment and review.

Continued cooperation with land use agencies (Town of Woodway, City of Edmonds, and Snohomish County) will be required for the long-term protection of the watershed. Copies of this document and maps indicating Capture Zones were provided to land use authorities and for incorporation into environmental protection legislation as appropriate.

Additional long-term protection of the water sources can be achieved by the District by being included in the permitting process for applications associated with activities which might involve use of potential contaminants. Appropriate forums for regulating activities which may impact the watershed, include Building Codes, Design Standards, Site Plan Review Procedures, and Subdivision and Zoning Regulations should include input from the District. The District has requested that each of the agencies listed above maintain a watershed protection area overlay indicating capture zone locations and keep a current copy of their Water Source Protection Plan on file for consideration in determining the suitability of development applications. Additional cooperative efforts are discussed in further detail in Appendix C.

Periodic meetings with the appropriate agencies is recommended as a means of ongoing coordination with those agencies. Topics for consideration might include minimum design standards within the identified Capture Zones, Emergency Response Coordination, and public notification programs which might be implemented to raise public awareness of the importance of watershed protection.

### **6.5 NOTIFICATION OF POTENTIAL CONTAMINANT SOURCES**

Notification of businesses within the source protection Capture Zones identified in this Plan is imperative to public awareness and long-term protection. Initial contact as well as periodic data and information distribution is recommended. Identified potential sources of contaminants identified in Table 2 have been notified by letter. Sample letters are included in Plan Appendix D.

All property owners within the Capture and Buffer zones surrounding the source protection areas have been notified by direct mailing to indicate the importance of taking care to protect the environment in close proximity to Deer Creek Springs and the 228th Street SW Well Field. As documented in Appendix D, general information regarding use of chemicals, fertilizers and potential contaminants will be provided. Additional information regarding the importance of proper septic tank operation and maintenance will be accomplished through District newsletters and in cooperation with other agencies.

## **6.6 GENERAL PUBLIC AWARENESS PROGRAM**

In addition to coordinating with appropriate regulatory agencies and notifying potential point source contaminant property owners, the District maintains a pro-active approach to encouraging all of its customers to participate in watershed protection. Those customers within the identified Capture Zones will receive periodic mailings regarding their direct and indirect roles in protecting the watershed. These notices will include statements regarding the importance of maintaining a safe water supply as well as specific information pertaining to the use of potential contaminants and proper maintenance of on-site sewage disposal systems.

In addition, the District will continue to include information on water source protection in its annual Water Quality Report, and periodic newsletters, and utilize other public forums for educating the public about this important subject. Preprinted brochures and other educational information from national organizations such as the American Water Works Association, as well as information from the Environmental Protection Agency and State Departments of Health and Ecology should be made available to the District's customers as appropriate.

## **6.7 CONTINUED MONITORING**

Continued groundwater monitoring is required as a means of maintaining a long-term water quality history within the watershed and identifying any potential changes in water quality and required changes in treatment of the water obtained from the source.

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## 7.0 CONTINGENCY PLAN

As indicated earlier in this Plan, Olympic View Water & Sewer District has four separate sources of supply available to it: the Deer Creek Source, the 228th Street SW Well Field, as well as supply from the City of Seattle to the south and emergency interties with the City of Edmonds, which could provide Everett regional supply water from the north. In accordance with the District's established emergency response program, any compromise or interruption of the Deer Creek or 228th Street SW Well Field supply would most likely be compensated for by increasing the amount of water obtained from the regular Seattle supply. This could be accomplished by opening and closing valves within the system and no capital improvements would be required. The interties with Edmonds could also be activated if additional supply was needed to augment the Seattle source for any reason.

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## 8.0 OLYMPIC VIEW WATER & SEWER DISTRICT WATERSHED PROTECTION GUIDELINES

It is the intent of this document to provide guidelines for use by the Olympic View Water & Sewer District staff, the agencies having jurisdiction over land use within the District, and the general public as appropriate, for the long-term protection of the District's Deer Creek Watershed, 228<sup>th</sup> Street Wellfield, and public water supply facilities. As noted previously, the zone of potential contamination extends outside of the District's service area. The following key elements have been identified as critical features of a successful Water Source Protection Plan.

### 8.1 REGULATORY CONTROL

Although the District does not maintain any authority over land use regulations and requirements, the District is charged with protecting the water resources it relies on to supply public drinking supply within its service area. As these resources are finite and limited, the District will work with development and regulatory agencies with authority through participation in the development of land use regulations and review of proposed development applications in areas that could affect the District's water sources. Input from the District is especially important in those areas where potential sources of contamination extend outside of the District's service area. Specifically, within Snohomish County and the cities of Shoreline and Edmonds. The following regulatory measures should be used by land use agencies as a means of minimizing the potential for contamination of, and participation in the long-term protection of, the District's water supply:

- Identify the watershed and wellhead protection areas, in all appropriate Critical Area regulations and mapping by adopting the District delineated Wellhead Protection and Watershed Control Areas and associated buffers where possible;
- Prohibit new onsite sewage disposal systems within the watershed and wellhead protection areas;
- Prohibit potential pollutants and any other known sources of contaminants within the watershed and wellhead protection areas.
- Prohibit landfills, including hazardous or dangerous waste, municipal solids, special waste, wood waste, and inert and demolition waste, landfills within the watershed and wellhead protection areas;
- Prohibit mining of metals and hard rock within the watershed and wellhead protection areas;
- Prohibit wood treatment facilities occurring over permeable surfaces (natural or manmade) within the watershed and wellhead protection areas;
- Prohibit facilities that store, process, or dispose of radioactive substances within the watershed and wellhead protection areas;
- Require that oil-based and detergent based waste materials are treated by the



- sanitary sewer system within the watershed and wellhead protection areas;
- Require storm drainage facilities designed to prevent pollutants from entering groundwater within the watershed and wellhead protection areas in accordance with WAC 173-200 and all other applicable laws and regulations;
  - Prohibit the use of underground injection (UIC) wells within the watershed and wellhead protection areas;
  - Prohibit the use of reclaimed water for groundwater recharge or other uses which may contaminate drinking water within the watershed or wellhead protection areas;
  - Prohibit pervious pavement, tire crumb rubber, PFAS generating, and other pollutant generating surfaces within the watershed and wellhead protection areas;
  - Provide early notice and allow the District to review any proposed development or activity that could adversely impact the watershed or wellhead protection areas;
  - Require the completion of hydrogeologic impact reports, prepared and submitted by a Washington licensed hydrogeologist, for any proposed development or activities within the watershed or wellhead protection areas;
  - Adopt regulations to condition or restrict allowed development in order to prevent adverse impacts to the watershed or wellhead protection areas in accordance with WAC 173-200, RCW 90.48 and all other applicable laws and regulations; and
  - Work with adjacent jurisdictions; Snohomish County, City of Edmonds, City of Shoreline, Town of Woodway, Mountlake Terrace, Lynnwood, on regulations to ensure water source quality for those areas outside of the District's service area.

## 8.2 PROTECTION ACTIVITIES

Long-term cooperation with the various land use and emergency response agencies has been identified as another key element in the protection of the District's water sources. This will likely include the following activities:

Consideration of the potential impacts on the watershed should be made in reviewing development proposals. Are there contaminants that could affect the District's water sources, what is the source, what is the location of the source, is treatment needed, are changes to current treatments needed. The District may be able to assist in this determination if necessary to evaluate unique or questionable proposals.

Notification of any potential threat to the water supply system is also a critical element of the long-term success of this program. Cooperation between all emergency response participants is required to ensure that proper notifications of spills, septic tank failures, or other threats to the water source are made.

Remedial activities and planned mitigation measures associated with the watershed should be coordinated with the District.

In addition, because the aquifer is a relatively shallow system which is directly exposed at the surface in many places within the watershed, extra protection is recommended. As such, the District has incorporated buffer zones as part of the WHPAs for both sources. These buffer zones, which incorporate the entire zone of contribution up-gradient of Zone 3 for both sources, are shown on Figure 7 in Appendix B.

Within the WHPAs presented on Figure 7 (appendix B), there is cause for additional concern in the areas where the aquifer material (Qva outwash) is mapped as the surficial geologic unit. Figure 8 in Appendix A of the Robinson Noble report presents a composite map that identifies these specific areas. The Qva aquifer has no natural geologic protection in these locations and is highly vulnerable to impact from various activities that may occur within these areas. As such, additional precautions are warranted for these specific areas.

Additionally, the buffer zone (zone of contribution) for the 228th Street wellfield reaches Hall Creek (see Figure 8, Appendix B). This indicates that water from Hall Creek directly recharges a portion of the aquifer that supplies water to the wellfield. Based on current modeling, water from the creek will reach the wellfield within an estimated period of about 18 years. The District urges local land use authorities to reference and adopt these maps where possible for Critical Areas Ordinance protections and periodic updates.

Based on this, the District will work with any agencies or entities monitoring water quality along this portion of the creek and request that the Department of Ecology and Snohomish County Environmental Health inform the District of any reported or suspected spills or contamination of soils or groundwater events that may occur in this reach of Hall Creek.

### **8.3 PROGRAM PROMOTION**

Protection of the District's water source is a community responsibility that should be shared by public agencies, private citizens, and businesses. Program promotion through public education is critical to the overall effectiveness of protecting the water source. The following general activities should be considered as a means of promoting protection of the watershed and water supply.

1. Septic Tank and Drain field Maintenance program promotion. The District is to be notified in the event of a suspected septic tank failure and any surfacing sewage.
2. Use of chemical fertilizers and pesticides/herbicides by parks departments, businesses and residences in the capture zones is discouraged.
3. Protection of surface water bodies and groundwater wells through public awareness and integration of drinking water protection into stormwater and pollution prevention outreach.
4. Oil-based and detergent-based waste materials are to be treated by the sanitary sewer system.

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Olympic View Water & Sewer District  
Watershed Protection Plan  
Edmonds, Washington

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## Appendix A

### Pertinent Washington Administrative Codes

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[Complete Chapter](#) | [Show Dispositions](#)

## Chapter 246-290 WAC

Last Update: 12/14/16

### GROUP A PUBLIC WATER SUPPLIES

#### WAC Sections

#### PART 1. GENERAL PROVISIONS

- 246-290-001** Purpose and scope.
- 246-290-002** Guidance.
- 246-290-010** Definitions, abbreviations, and acronyms.
- 246-290-020** Applicability.
- 246-290-025** Adoption by reference.
- 246-290-030** General administration.
- 246-290-035** Water system ownership.
- 246-290-040** Engineering requirements.
- 246-290-050** Enforcement.
- 246-290-060** Variances, exemptions, and waivers.

#### PART 2. PLANNING AND ENGINEERING DOCUMENTS

- 246-290-100** Water system plan.
- 246-290-105** Small water system management program.
- 246-290-106** Duty to provide service.
- 246-290-107** Place of use expansion.
- 246-290-108** Consistency with local plans and regulations.
- 246-290-110** Project report.
- 246-290-120** Construction documents.
- 246-290-125** Project report and construction document submittal exceptions.
- 246-290-130** Source approval.
- 246-290-131** Emergency sources and supplies.
- 246-290-132** Interties.
- 246-290-135** Source water protection.
- 246-290-140** Existing system as-built approval.

PART 6.  
SURFACE WATER TREATMENT

Subpart A - Introduction and General Requirements

- 246-290-601** Purpose of surface water treatment.
- 246-290-620** Applicability of surface water treatment requirements.
- 246-290-630** General requirements.
- 246-290-632** Treatment technique violations.
- 246-290-634** Follow-up to treatment technique violations.
- 246-290-636** Determination of disinfectant contact time (T).
- 246-290-638** Analytical requirements.
- 246-290-639** SWTR records.
- 246-290-640** Determination of GWI sources.

Subpart B - Requirements for Filtered Systems

- 246-290-650** Compliance requirements for filtered systems.
- 246-290-652** Filtration technology and design criteria for existing filtered systems.
- 246-290-654** Treatment criteria for filtered systems.
- 246-290-660** Filtration.
- 246-290-662** Disinfection for filtered systems.
- 246-290-664** Monitoring for filtered systems.
- 246-290-666** Reporting for filtered systems.
- 246-290-668** Watershed control.

Subpart C - Requirements for Systems Installing Filtration Facilities

- 246-290-670** Compliance requirements for existing unfiltered systems installing filtration.
- 246-290-672** Interim treatment requirements.
- 246-290-674** Interim monitoring and reporting.
- 246-290-676** Filtration technology and design criteria.
- 246-290-678** Reliability for filtered systems.

Subpart D - Requirements for Other Unfiltered Systems

- 246-290-686** Compliance requirements for unfiltered systems.
- 246-290-690** Criteria to remain unfiltered.
- 246-290-691** Criteria for unfiltered systems with a "limited alternative to filtration" to remain
- 246-290-692** Disinfection for unfiltered systems.
- 246-290-694** Monitoring for unfiltered systems.
- 246-290-696** Reporting for unfiltered systems.

**PART 1.**  
**GENERAL PROVISIONS**

**WAC 246-290-001****Purpose and scope.**

(1) The purpose of this chapter is to define basic regulatory requirements and to protect the health of consumers using public drinking water supplies.

(2) The rules of this chapter are specifically designed to ensure:

(a) Adequate design, construction, sampling, management, maintenance, and operation practices; and

(b) Provision of safe and high quality drinking water in a reliable manner and in a quantity suitable for intended use.

(3) Purveyors shall be responsible for complying with the regulatory requirements of this chapter.

(4) These rules are intended to conform with Public Law 93-523, the Federal Safe Drinking Water Act of 1974, and Public Law 99-339, the Safe Drinking Water Act Amendments of 1986, and certain provisions of Public Law 104-182, the Safe Drinking Water Act Amendments of 1996.

(5) The rules set forth are adopted under chapter **43.20** RCW. Other statutes relating to this chapter are:

(a) RCW **43.20B.020**, Fees for services—Department of health and department of social and health services;

(b) Chapter **43.70** RCW, Department of health;

(c) Chapter **70.05** RCW, Local health department, boards, officers—Regulations;

(d) Chapter **70.116** RCW, Public Water System Coordination Act of 1977;

(e) Chapter **70.119** RCW, Public water supply systems—Operators;

(f) Chapter **70.119A** RCW, Public water systems—Penalties and compliance; and

(g) Chapter **70.142** RCW, Chemical contaminants and water quality.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-001, filed 12/14/16, effective 1/14/17. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-001, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 93-08-011 (Order 352B), § 246-290-001, filed 3/25/93, effective 4/25/93; WSR 91-02-051 (Order 124B), recodified as § 246-290-001, filed 12/27/90, effective 1/31/91. Statutory Authority: P.L. 99-339. WSR 89-21-020 (Order 336), § 248-54-005, filed 10/10/89, effective 11/10/89. Statutory Authority: RCW **34.04.045**. WSR 88-05-057 (Order 307), § 248-54-005, filed 2/17/88. Statutory Authority: RCW **43.20.050**. WSR 83-19-002 (Order 266), § 248-54-005, filed 9/8/83.]



## WAC 246-290-002

### Guidance.

(1) The department has numerous guidance documents available to help purveyors comply with state and federal rules regarding drinking water. These include documents on the following subjects:

- (a) Compliance;
- (b) Consumer and public education;
- (c) Contaminants;
- (d) Cross-connection control and backflow prevention;
- (e) Emergency response and drinking water security;
- (f) Engineering design and water treatment;
- (g) Financial assistance and state revolving fund (SRF);
- (h) General information;
- (i) Groundwater protection;
- (j) Growth management;
- (k) Operations and maintenance;
- (l) Operator certification;
- (m) Planning and financial viability;
- (n) Regulations;
- (o) Small water systems;
- (p) System approval;
- (q) Water quality monitoring and source protection;
- (r) Water system planning; and
- (s) Water use efficiency.

(2) The department's guidance documents are available online at <https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm> or through U.S. mail at P.O. Box 47822, Olympia, Washington 98504-7822.

(3) Federal guidance documents are available from the Environmental Protection Agency (EPA) for a wide range of topics. These are available from the EPA Office of Ground Water and Drinking Water web site at <http://water.epa.gov/drink.index.cfm>.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-002, filed 12/14/16, effective 1/14/17; WSR 10-20-068, § 246-290-002, filed 9/29/10, effective 11/1/10. Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-002, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **43.20.050** (2) and (3) and **70.119A.080**. WSR 03-08-037, § 246-290-002, filed 3/27/03, effective 4/27/03. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-002, filed 3/9/99, effective 4/9/99.]

## WAC 246-290-010

### Definitions, abbreviations, and acronyms.

The definitions in this section apply throughout this chapter unless the context clearly indicates otherwise.

- (1) **"Acute"** means posing an immediate risk to human health.
- (2) **"ADD"** means an average day demand.
- (3) **"AG"** means an air gap.
- (4) **"Alternative filtration technology"** means a filtration process for substantial removal of particulates (generally > 2-log *Giardia lamblia* cysts and  $\geq$  2-log removal of *Cryptosporidium* oocysts) by other than conventional, direct, diatomaceous earth, or slow sand filtration processes.
- (5) **"Analogous treatment system"** means an existing water treatment system that has unit processes and source water quality characteristics that are similar to a proposed treatment system.
- (6) **"ANSI"** means the American National Standards Institute.
- (7) **"Approved air gap"** means a physical separation between the free-flowing end of a potable water supply pipeline and the overflow rim of an open or nonpressurized receiving vessel.

To be an air gap approved by the department, the separation must be at least:

  - (a) Twice the diameter of the supply piping measured vertically from the overflow rim of the receiving vessel, and in no case be less than one inch, when unaffected by vertical surfaces (sidewalls); and
  - (b) Three times the diameter of the supply piping, if the horizontal distance between the supply pipe and a vertical surface (sidewall) is less than or equal to three times the diameter of the supply pipe, or if the horizontal distance between the supply pipe and intersecting vertical surfaces (sidewalls) is less than or equal to four times the diameter of the supply pipe and in no case less than one and one-half inches.
- (8) **"Approved atmospheric vacuum breaker (AVB)"** means an AVB of make, model, and size that is approved by the department. AVBs that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or that are listed or approved by other nationally recognized testing agencies (such as IAPMO, ANSI, or UL) acceptable to the authority having jurisdiction are considered approved by the department.
- (9) **"Approved backflow preventer"** means an approved air gap, an approved backflow prevention assembly, or an approved AVB. The terms "approved backflow preventer," "approved air gap," or "approved backflow prevention assembly" refer only to those approved backflow preventers relied upon by the purveyor for the protection of the public water system. The requirements of WAC 246-290-490 do not apply to backflow preventers installed for other purposes.
- (10) **"Approved backflow prevention assembly"** means an RPBA, RPDA, DCVA, DCDA, PVBA, or SVBA of make, model, and size that is approved by the department. Assemblies that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or other entity acceptable to the department are considered approved by the department.

(11) **"As-built drawing"** means the drawing created by an engineer from the collection of the original design plans, including changes made to the design or to the system, that reflects the actual constructed condition of the water system.

(12) **"Assessment source water monitoring"** means an evaluation of groundwater sources that may be at risk for fecal contamination. Assessment source water monitoring involves the collection of source water samples at regular intervals and analysis of those samples for fecal indicators as directed by the department.

(13) **"Authority having jurisdiction"** (formerly known as local administrative authority) means the local official, board, department, or agency authorized to administer and enforce the provisions of the Uniform Plumbing Code as adopted under chapter 19.27 RCW.

(14) **"Authorized agent"** means any person who:

- (a) Makes decisions regarding the operation and management of a public water system whether or not he or she is engaged in the physical operation of the system;
- (b) Makes decisions whether to improve, expand, purchase, or sell the system; or
- (c) Has discretion over the finances of the system.

(15) **"Authorized consumption"** means the volume of metered and unmetered water used for municipal water supply purposes by consumers, the purveyor, and others authorized to do so by the purveyor, including, but not limited to, fire fighting and training, flushing of mains and sewers, street cleaning, and watering of parks and landscapes. These volumes may be billed or unbilled.

(16) **"AVB"** means an atmospheric vacuum breaker.

(17) **"Average day demand (ADD)"** means the total quantity of water use from all sources of supply as measured or estimated over a calendar year divided by three hundred sixty-five. ADD is typically expressed as gallons per day (gpd) per equivalent residential unit (ERU).

(18) **"AWWA"** means the American Water Works Association.

(19) **"Backflow"** means the undesirable reversal of flow of water or other substances through a cross-connection into the public water system or consumer's potable water system.

(20) **"Backflow assembly tester"** means a person holding a valid BAT certificate issued under chapter 246-292 WAC.

(21) **"Backpressure"** means a pressure (caused by a pump, elevated tank or piping, boiler, or other means) on the consumer's side of the service connection that is greater than the pressure provided by the public water system and which may cause backflow.

(22) **"Backsiphonage"** means backflow due to a reduction in system pressure in the purveyor's distribution system and/or consumer's water system.

(23) **"Bag filter"** means a pressure-driven separation device that removes particulate matter larger than 1 micrometer using an engineered porous filtration media. They are typically constructed of a nonrigid, fabric filtration media housed in a pressure vessel in which the direction of flow is from the inside of the bag to outside.

(24) **"Bank filtration"** means a water treatment process that uses a well to recover surface water that has naturally infiltrated into groundwater through a river bed or bank(s). Infiltration is typically enhanced by the hydraulic gradient imposed by a nearby pumping water supply or other well(s).

(25) **"BAT"** means a backflow assembly tester.

(26) **"Best available technology"** means the best technology, treatment techniques, or other means that EPA finds, after examination for efficacy under field conditions, are available, taking cost into consideration.

(27) **"Blended sample"** means a sample collected from two or more individual sources at a point downstream of the confluence of the individual sources and prior to the first connection.

(28) **"C"** means the residual disinfectant concentration in mg/L at a point before or at the first consumer.

(29) **"Cartridge filter"** means a pressure-driven separation device that removes particulate matter larger than 1 micrometer using an engineered porous filtration media. They are typically constructed as rigid or semi-rigid, self-supporting filter elements housed in pressure vessels in which flow is from the outside of the cartridge to the inside.

(30) **"Category red operating permit"** means an operating permit identified under chapter **246-294** WAC. Placement in this category results in permit issuance with conditions and a determination that the system is inadequate.

(31) **"CCP"** means composite correction program.

(32) **"CCS"** means a cross-connection control specialist.

(33) **"C.F.R."** means the Code of Federal Regulations.

(34) **"Chemical contaminant treatment facility"** means a treatment facility specifically used for the purpose of removing chemical contaminants.

(35) **"Clarification"** means a treatment process that uses gravity (sedimentation) or dissolved air (flotation) to remove flocculated particles.

(36) **"Clean compliance history"** means a record of:

(a) No *E. coli* MCL violations;

(b) No monitoring violations under WAC **246-290-300**(3); and

(c) No coliform treatment technique trigger exceedances or treatment technique violations under WAC **246-290-320**(2) or **246-290-415**.

(37) **"Closed system"** means any water system or portion of a water system in which water is transferred to a higher pressure zone closed to the atmosphere, such as when no gravity storage is present.

(38) **"Coagulant"** means a chemical used in water treatment to destabilize particulates and accelerate the rate at which they aggregate into larger particles.

(39) **"Coagulation"** means a process using coagulant chemicals and rapid mixing to destabilize colloidal and suspended particles and agglomerate them into flocs.

(40) **"Combination fire protection system"** means a fire sprinkler system that:

(a) Is supplied only by the purveyor's water;

(b) Does not have a fire department pumper connection; and

(c) Is constructed of approved potable water piping and materials that serve both the fire sprinkler system and the consumer's potable water system.

(41) **"Combined distribution system"** means the interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water.

(42) **"Completely treated water"** means water from a surface water source, or a groundwater source under the direct influence of surface water (GWI) source that receives filtration or disinfection treatment that fully complies with the treatment technique requirements of Part 6 of this chapter as determined by the department.

(43) **"Composite correction program (CCP)"** means a program that consists of two elements - a comprehensive performance evaluation (CPE) and comprehensive technical assistance (CTA).

(44) **"Composite sample"** means a sample in which more than one source is sampled individually by the water system and then composited by a certified laboratory by mixing equal parts of water from each source (up to five different sources) and then analyzed as a single sample.

(45) **"Comprehensive monitoring plan"** means a schedule that describes both the frequency and appropriate locations for sampling of drinking water contaminants as required by state and federal rules.

(46) **"Comprehensive performance evaluation (CPE)"** means a thorough review and analysis of a treatment plant's performance-based capabilities and associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant's capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements.

The comprehensive performance evaluation must consist of at least the following components:

- (a) Assessment of plant performance;
- (b) Evaluation of major unit processes;
- (c) Identification and prioritization of performance limiting factors;
- (d) Assessment of the applicability of comprehensive technical assistance; and
- (e) Preparation of a CPE report.

(47) **"Comprehensive technical assistance (CTA)"** means the performance improvement phase that is implemented if the CPE results indicate improved performance potential. The system must identify and systematically address plant-specific factors. The CTA is a combination of using CPE results as a basis for follow-up, implementing process control priority-setting techniques, and maintaining long-term involvement to systematically train staff and administrators.

(48) **"Confirmation"** means to demonstrate the accuracy of results of a sample by analyzing another sample from the same location within a reasonable period of time, generally not to exceed two weeks. Confirmation is when analysis results fall within plus or minus thirty percent of the original sample results.

(49) **"Confluent growth"** means a continuous bacterial growth covering a portion or the entire filtration area of a membrane filter in which bacterial colonies are not discrete.

(50) **"Consecutive system"** means a public water system that receives some or all of its finished water from one or more wholesale systems. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

(51) **"Construction completion report"** means a form provided by the department and completed for each specific construction project to document:

- (a) Project construction in accordance with this chapter and general standards of engineering practice;
- (b) Physical capacity changes; and
- (c) Satisfactory test results.

The completed form must be stamped with an engineer's seal, and signed and dated by a professional engineer.

(52) **"Consumer"** means any person receiving water from a public water system from either the meter, or the point where the service line connects with the distribution system if no meter is present. For purposes of cross-connection control, "consumer" means the owner or operator of a water system connected to a public water system through a service connection.

(53) "**Consumer's water system**," as used in WAC **246-290-490**, means any potable or industrial water system that begins at the point of delivery from the public water system and is located on the consumer's premises. The consumer's water system includes all auxiliary sources of supply, storage, treatment, and distribution facilities, piping, plumbing, and fixtures under the control of the consumer.

(54) "**Contaminant**" means a substance present in drinking water that may adversely affect the health of the consumer or the aesthetic qualities of the water.

(55) "**Contingency plan**" means that portion of the wellhead protection program section of the water system plan or small water system management program that addresses the replacement of the major well(s) or wellfield in the event of loss due to groundwater contamination.

(56) "**Continuous monitoring**" means determining water quality with automatic recording analyzers that operate without interruption twenty-four hours per day.

(57) "**Conventional filtration treatment**" means a series of processes including coagulation, flocculation, clarification, and filtration that together result in substantial particulate removal in compliance with Part 6 of this chapter.

(58) "**Corrective action plan**" means specific written actions and deadlines developed by the water system or the department that the system must follow as a result of either the identification of significant deficiencies during a sanitary survey or the determination of a fecal indicator-positive sample in source water monitoring.

(59) "**Cost-effective**" means the benefits exceed the costs.

(60) "**Council**" means the Washington state building code council under WAC **51-04-015(2)**.

(61) "**CPE**" means a comprehensive performance evaluation.

(62) "**Critical water supply service area (CWSSA)**" means a geographical area which is characterized by a proliferation of small, inadequate water systems, or by water supply problems which threaten the present or future water quality or reliability of service in a manner that efficient and orderly development may best be achieved through coordinated planning by the water utilities in the area as set forth by the Public Water System Coordination Act, chapter **70.116** RCW and chapter **246-293** WAC.

(63) "**Cross-connection**" means any actual or potential physical connection between a public water system or the consumer's water system and any source of nonpotable liquid, solid, or gas that could contaminate the potable water supply by backflow.

(64) "**Cross-connection control program**" means the administrative and technical procedures the purveyor implements to protect the public water system from contamination via cross-connections as required in WAC **246-290-490**.

(65) "**Cross-connection control specialist**" means a person holding a valid CCS certificate issued under chapter **246-292** WAC.

(66) "**Cross-connection control summary report**" means the annual report that describes the status of the purveyor's cross-connection control program.

(67) "**CT**" or "**CTcalc**" means the product of "residual disinfectant concentration" (C) and the corresponding "disinfectant contact time" (T) i.e., "C" x "T."

(68) "**CT<sub>99.9</sub>**" means the CT value required for 99.9 percent (3-log) inactivation of *Giardia lamblia* cysts.

(69) "**CTA**" means comprehensive technical assistance.

(70) **"CTreq"** means the CT value a system shall provide to achieve a specific percent inactivation of *Giardia lamblia* cysts or other pathogenic organisms of health concern as directed by the department.

(71) **"Curtailement"** means short-term, infrequent actions by a purveyor and its consumers to reduce their water use during or in anticipation of a water shortage.

(72) **"CWSSA"** means a critical water supply service area.

(73) **"DBPs"** means disinfection byproducts.

(74) **"DCDA"** means a double check detector assembly.

(75) **"DCVA"** means a double check valve assembly.

(76) **"Dead storage"** means the volume of stored water not available to all consumers at the minimum design pressure under WAC 246-290-230 (5) and (6).

(77) **"Demand forecast"** means an estimate of future water system water supply needs assuming historically normal weather conditions and calculated using numerous parameters, including population, historic water use, local land use plans, water rates and their impacts on consumption, employment, projected water use efficiency savings from implementation of a water use efficiency program, and other appropriate factors.

(78) **"Department"** means the Washington state department of health or health officer as identified in a joint plan of responsibility under WAC 246-290-030(1).

(79) **"Design and construction standards"** means department design guidance and other peer reviewed documents generally accepted by the engineering profession as containing fundamental criteria for design and construction of water facility projects. Design and construction standards are comprised of performance and sizing criteria and reference general construction materials and methods.

(80) **"Detectable residual disinfectant concentration"** means 0.2 mg/L free chlorine, total chlorine, combined chlorine, or chlorine dioxide.

(81) **"Diatomaceous earth filtration"** means a filtration process for substantial removal of particulates (> 2-log *Giardia lamblia* cysts) in which:

(a) A precoat cake of graded diatomaceous earth filter media is deposited on a support membrane (septum); and

(b) Water is passed through the cake on the septum while additional filter media, known as body feed, is continuously added to the feed water to maintain the permeability of the filter cake.

(82) **"Direct filtration"** means a series of processes including coagulation, flocculation, and filtration (but excluding sedimentation) that together result in substantial particulate removal in compliance with Part 6 of this chapter.

(83) **"Direct service connection"** means a service hookup to a property that is contiguous to a water distribution main and where additional distribution mains or extensions are not needed to provide service.

(84) **"Disinfectant contact time (T in CT)"** means:

(a) When measuring the first or only C, the time in minutes it takes water to move from the point of disinfectant application to a point where the C is measured; and

(b) For subsequent measurements of C, the time in minutes it takes water to move from one C measurement point to the C measurement point for which the particular T is being calculated.

(85) **"Disinfection"** means the use of chlorine or other agent or process the department approves for killing or inactivating microbiological organisms, including pathogenic and indicator organisms.

(86) **"Disinfection profile"** means a summary of *Giardia lamblia* inactivation through a surface water treatment plant.

(87) **"Distribution coliform sample"** means a sample of water collected from a representative location in the distribution system at or after the first service and analyzed for coliform presence in compliance with this chapter.

(88) **"Distribution-related projects"** means distribution projects such as storage tanks, booster pump facilities, transmission mains, pipe linings, and tank coating. It does not mean source of supply (including interties) or water quality treatment projects.

(89) **"Distribution system"** means all piping components of a public water system that serve to convey water from transmission mains linked to source, storage and treatment facilities to the consumer excluding individual services.

(90) **"Domestic or other nondistribution system plumbing problem"** means contamination of a system having more than one service connection with the contamination limited to the specific service connection from which the sample was taken.

(91) **"Dual sample set"** means a set of two samples collected at the same time and same location, with one sample analyzed for TTHM and the other sample analyzed for HAA5. Dual sample sets are collected for the purposes of conducting an IDSE under WAC 246-290-300 (6)(b)(i)(F) and determining compliance with the TTHM and HAA5 MCLs under WAC 246-290-310(4).

(92) **"Duplicate (verification) sample"** means a second sample collected at the same time and location as the first sample and used for verification.

(93) **"DVGW"** means Deutsche Vereinigung des Gas und Wasserfaches.

(94) **"Elected governing board"** means the elected officers with ultimate legal responsibility for operational, technical, managerial, and financial decisions for a public water system.

(95) **"Emergency"** means an unforeseen event that causes damage or disrupts normal operations and requires immediate action to protect public health and safety.

(96) **"Emergency source"** means any source that a purveyor intends to use for emergency purposes only and not used for routine or seasonal water demands.

(97) **"Engineering design review report"** means a form provided by the department and completed for a specific distribution-related project to document:

(a) Engineering review of a project report and/or construction documents under the submittal exception process in WAC 246-290-125(3); and

(b) Design in accordance with this chapter and general standards of engineering practice.

(c) The completed form must be stamped with engineer's seal, and signed and dated by a professional engineer.

(98) **"EPA"** means the U.S. Environmental Protection Agency.

(99) **"Equalizing storage"** means the volume of storage needed to supplement supply to consumers when the peak hourly demand exceeds the total source pumping capacity.

(100) **"Equivalent residential unit (ERU)"** means a system-specific unit of measure used to express the amount of water consumed by a typical full-time single family residence.

(101) **"ERU"** means an equivalent residential unit.

(102) **"Expanding public water system"** means a public water system that increases the geographical area where direct service connections are available or increases the approved number of service connections.



(103) **"Filter profile"** means a graphical representation of individual filter performance in a direct or conventional surface water filtration plant, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.

(104) **"Filtration"** means a process for removal of particulate matter from water by passage through porous media.

(105) **"Financial viability"** means the capability of a water system to obtain sufficient funds to construct, operate, maintain, and manage a public water system, on a continuing basis, in full compliance with federal, state, and local requirements.

(106) **"Finished water"** means water introduced into a public water system's distribution system and is intended for distribution and consumption without further treatment, except as treatment necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals).

(107) **"Finished water storage facility"** means a water storage structure that is integrated with a water system's distribution network to provide for variable system demands including, but not limited to, daily equalizing storage, standby storage, or fire reserves, or to provide for disinfectant contact time.

(108) **"Fire flow"** means the maximum rate and duration of water flow needed to suppress a fire under WAC **246-293-640** or as required under local fire protection authority standards.

(109) **"Fire suppression storage"** means the volume of stored water available during fire suppression activities to satisfy minimum pressure requirements per WAC **246-290-230**.

(110) **"First consumer"** means the first service connection associated with any source (i.e., the point where water is first withdrawn for human consumption, excluding connections where water is delivered to another water system covered by these regulations).

(111) **"Flocculation"** means a process enhancing agglomeration and collection of colloidal and suspended particles into larger, more easily settleable or filterable particles by gentle stirring.

(112) **"Flowing stream"** means a course of running water flowing in a definite channel.

(113) **"Flow-through fire protection system"** means a fire sprinkler system that:

- (a) Is supplied only by the purveyor's water;
- (b) Does not have a fire department pumper connection;
- (c) Is constructed of approved potable water piping and materials to which sprinkler heads are attached; and
- (d) Terminates at a connection to a toilet or other plumbing fixture to prevent stagnant water.

(114) **"Forecasted demand characteristics"** means the factors that may affect a public water system's projected water needs.

(115) **"Future service area"** means a specific area a water system in a CWSSA plans to provide water service as determined by a written agreement between purveyors under chapter **70.116** RCW and chapter **246-293** WAC.

(116) **"GAC"** means granular activated carbon.

(117) **"GAC10"** means granular activated carbon filter beds with an empty-bed contact time of ten minutes based on average daily flow and a carbon reactivation frequency of every one hundred eighty days, except that the reactivation frequency for GAC10 used as a best

available technology for compliance with MCLs under WAC **246-290-310(4)** shall be one hundred twenty days.

(118) "**GAC20**" means granular activated carbon filter beds with an empty-bed contact time of twenty minutes based on average daily flow and a carbon reactivation frequency of every two hundred forty days.

(119) "**Governing body**" means the individual or group of individuals with ultimate legal responsibility for operational, technical, managerial, and financial decisions for a public water system.

(120) "**gph**" means gallons per hour.

(121) "**gpm**" means gallons per minute.

(122) "**Grab sample**" means a water quality sample collected at a specific instant in time and analyzed as an individual sample.

(123) "**Groundwater system**" means all public water systems that use groundwater including:

(a) Consecutive systems receiving finished groundwater; or

(b) Surface water systems with groundwater sources except those systems that combine all sources prior to treatment.

(124) "**Groundwater under the direct influence of surface water (GWI)**" means any water beneath the surface of the ground that the department determines has the following characteristics:

(a) Significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as *Giardia lamblia* or, *Cryptosporidium*; or

(b) Significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH closely correlating to climatological or surface water conditions where natural conditions cannot prevent the introduction of surface water pathogens into the source at the system's point of withdrawal.

(125) "**Guideline**" means a department document assisting the purveyor in meeting a rule requirement.

(126) "**GW**" means groundwater under the direct influence of surface water.

(127) "**GWR**" means groundwater rule.

(128) "**HAA5**" means haloacetic acids (five).

(129) "**Health officer**" means the health officer of the city, county, city-county health department or district, or an authorized representative.

(130) "**Heterotrophic Plate Count (HPC)**" means a procedure to measure a class of bacteria that use organic nutrients for growth. The density of these bacteria in drinking water is measured as colony forming units per milliliter and is referred to as the HPC.

(131) "**High health cross-connection hazard**" means a cross-connection involving any substance that could impair the quality of potable water and create an actual public health hazard through injury, poisoning, or spread of disease.

(132) "**HPC**" means heterotrophic plate count.

(133) "**Human consumption**" means the use of water for drinking, bathing or showering, hand washing, food preparation, cooking, or oral hygiene.

(134) "**Hydraulic analysis**" means the study of a water system's distribution main and storage network to determine present or future adequacy for provision of service to consumers within the established design parameters for the system under peak flow conditions, including fire flow. The analysis is used to establish any need for improvements to existing systems or to substantiate adequacy of design for distribution system components

such as piping, elevated storage, booster stations or similar facilities used to pump and convey water to consumers.

(135) **"IAPMO"** means the International Association of Plumbing and Mechanical Officials.

(136) **"IDSE"** means an initial distribution system evaluation.

(137) **"Inactivation"** means a process which renders pathogenic microorganisms incapable of producing disease.

(138) **"Inactivation ratio"** means the ratio obtained by dividing CT<sub>calc</sub> by CT<sub>req</sub>.

(139) **"Incompletely treated water"** means water from a surface or GWI source that receives filtration and/or disinfection treatment that does not fully comply with the treatment technique requirements of Part 6 of this chapter as determined by the department.

(140) **"In-line filtration"** means a series of processes, including coagulation and filtration (but excluding flocculation and sedimentation) that together result in particulate removal.

(141) **"In-premises protection"** means a method of protecting the health of consumers served by the consumer's potable water system, located within the property lines of the consumer's premises by the installation of an approved air gap or backflow prevention assembly at the point of hazard, which is generally a plumbing fixture.

(142) **"Intertie"** means an interconnection between public water systems permitting the exchange or delivery of water between those systems.

(143) **"kPa"** means kilo pascal (SI units of pressure).

(144) **"Lake or reservoir"** means a natural or man-made basin or hollow on the earth's surface in which water collects or is stored that may or may not have a current or single direction of flow.

(145) **"Legionella"** means a genus of bacteria containing species which cause a type of pneumonia called Legionnaires' Disease.

(146) **"Level 1 assessment"** means an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and when possible, the likely reason that the system triggered the assessment. The assessment is conducted by the system operator or the purveyor.

(147) **"Level 2 assessment"** means an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and when possible, the likely reason that the system triggered the assessment. A level 2 assessment is a more detailed examination of the system (including the system's monitoring and operational practices) than is a level 1 assessment through the use of a more comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices. The level 2 assessment is conducted by a party approved by the department.

(148) **"Limited alternative to filtration"** means a process that ensures greater removal and/or inactivation efficiencies of pathogenic organisms than would be achieved by the combination of filtration and chlorine disinfection.

(149) **"Local plans and regulations"** means any comprehensive plan or development regulation adopted under chapter **36.70A** RCW or any other applicable comprehensive plan, land use plan, or development regulation adopted by a city, town, or county for the applicable service area.

(150) "**Locational running annual average (LRAA)**" means the average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.

(151) "**Low cross-connection hazard**" means a cross-connection that could impair the quality of potable water to a degree that does not create a hazard to the public health, but does adversely and unreasonably affect the aesthetic qualities of potable waters for domestic use.

(152) "**LRAA**" means the locational running annual average.

(153) "**Major project**" means all construction projects subject to the State Environmental Policy Act (SEPA) under chapter **43.21C** RCW, and meeting the requirements of WAC **246-03-030** (3)(a).

(154) "**Mandatory curtailment**" means curtailment required by a public water system of specified water uses and consumer classes for a specified period of time.

(155) "**Marginal costs**" means the costs incurred by producing the next increment of supply.

(156) "**Maximum contaminant level (MCL)**" means the maximum permissible level of a contaminant in water the purveyor delivers to any public water system user, measured at the locations identified under WAC **246-290-310**, Table 5.

(157) "**Maximum contaminant level violation**" means a confirmed measurement above the MCL and for a duration of time, where applicable, as outlined under WAC **246-290-310**.

(158) "**Maximum day demand (MDD)**" means the highest actual or estimated quantity of water that is, or is expected to be, used over a twenty-four hour period, excluding unusual events or emergencies. MDD is typically expressed as gallons per day per ERU (gpd/ERU).

(159) "**MCL**" means the maximum contaminant level.

(160) "**MDD**" means the maximum day demand.

(161) "**Membrane filtration**" means a pressure or vacuum driven separation process in which particulate matter larger than 1 micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism, and which has a measurable removal efficiency of a target organism that can be verified through the application of a direct integrity test. This definition includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration, and reverse osmosis.

(162) "**mg/L**" means milligrams per liter (1 mg/L = 1 ppm).

(163) "**mL**" means a milliliter.

(164) "**mm**" means a millimeter.

(165) "**Monitoring waiver**" means an action taken by the department under WAC **246-290-300** (4)(g) or (7)(f) to allow a water system to reduce specific monitoring requirements based on a determination of low source vulnerability to contamination.

(166) "**MRDL**" means the maximum residual disinfectant level.

(167) "**MRDLG**" means the maximum residual disinfectant level goal.

(168) "**MTTP**" means maximum total trihalomethane potential.

(169) "**Municipal water supplier**" means an entity that supplies water for municipal water supply purposes.

(170) "**Municipal water supply purposes**" means a beneficial use of water:

(a) For residential purposes through fifteen or more residential service connections or for providing residential use of water for a nonresidential population that is, on average, at least twenty-five people for at least sixty days a year;

(b) For governmental or governmental proprietary purposes by a city, town, public utility district, county, sewer district, or water district; or

(c) Indirectly for the purposes in (a) or (b) of this definition through the delivery of treated or raw water to a public water system for such use.

(i) If water is beneficially used under a water right for the purposes listed in (a), (b), or (c) of this definition, any other beneficial use of water under the right generally associated with the use of water within a municipality is also for "municipal water supply purposes," including, but not limited to, beneficial use for commercial, industrial, irrigation of parks and open spaces, institutional, landscaping, fire flow, water system maintenance and repair, or related purposes.

(ii) If a governmental entity holds a water right that is for the purposes listed in (a), (b), or (c) of this definition, its use of water or its delivery of water for any other beneficial use generally associated with the use of water within a municipality is also for "municipal water supply purposes," including, but not limited to, beneficial use for commercial, industrial, irrigation of parks and open spaces, institutional, landscaping, fire flow, water system maintenance and repair, or related purposes.

(171) "**Nested storage**" means one component of storage is contained within the component of another.

(172) "**Nonacute**" means posing a possible or less than immediate risk to human health.

(173) "**Nonresident**" means a person having access to drinking water from a public water system who lives elsewhere. Examples include travelers, transients, employees, students, etc.

(174) "**Normal operating conditions**" means those conditions associated with the designed, day-to-day provision of potable drinking water that meets regulatory water quality standards and the routine service expectations of the system's consumers at all times, including meeting fire flow demands. Operation under conditions such as power outages, floods, or unscheduled transmission or distribution disruptions, even if considered in the system design, are considered abnormal.

(175) "**NSF**" means NSF International (formerly known as the National Sanitation Foundation (NSF)).

(176) "**NTNC**" means nontransient noncommunity.

(177) "**NTU**" means a nephelometric turbidity unit.

(178) "**ONORM**" means Österreichisches Normungsinstitut.

(179) "**Operational storage**" means the volume of distribution storage associated with source or booster pump normal cycling times under normal operating conditions and is additive to the equalizing and standby storage components, and to fire flow storage if this storage component exists for any given tank.

(180) "**PAA**" means a project approval application.

(181) "**pCi/L**" means picocuries per liter.

(182) "**Peak hourly demand (PHD)**" means the maximum rate of water use, excluding fire flow, that can be expected to occur within a defined service area over a continuous sixty minute time period. PHD is typically expressed in gallons per minute (gpm).

(183) **"Peak hourly flow"** means, for the purpose of CT calculations, the greatest volume of water passing through the system during any one hour in a day.

(184) **"Performance criteria"** means the level at which a system shall operate in order to maintain system reliability compliance, in accordance with WAC **246-290-420**, and to meet consumers' reasonable expectations.

(185) **"Permanent residence"** means any dwelling that is, or could reasonably be expected to be, occupied on a continuous basis.

(186) **"Permanent source"** means a public water system supply source that is used regularly each year, and based on expected operational requirements of the system, will be used more than three consecutive months in any twelve-month period. For seasonal water systems that are in operation for less than three consecutive months per year, their sources shall also be considered to be permanent.

(187) **"PHD"** means peak hourly demand.

(188) **"Plant intake"** means the works or structures at the head of a conduit through which water is diverted from a source (e.g., river or lake) into the treatment plant.

(189) **"Point of disinfectant application"** means the point where the disinfectant is added, and where water downstream of that point is not subject to contamination by untreated surface water.

(190) **"Population served"** means the number of persons, resident and nonresident, having immediate access to drinking water from a public water system, whether or not persons have actually consumed water from that system. The number of nonresidents shall be the average number of persons having immediate access to drinking water on days access was provided during that month. In the absence of specific population data, the number of residents shall be computed by multiplying the number of active services by two and one-half.

(191) **"Potable"** means water suitable for drinking by the public.

(192) **"Potential GWI"** means a source identified by the department as possibly under the influence of surface water, and includes, but is not limited to, all wells with a screened interval fifty feet or less from the ground surface at the wellhead and located within two hundred feet of a surface water, and all Ranney wells, infiltration galleries, and springs.

(193) **"ppm"** means parts per million (1 ppm = 1 mg/L).

(194) **"Premises isolation"** means a method of protecting a public water system by installation of approved air gaps or approved backflow prevention assemblies at or near the service connection or alternative location acceptable to the purveyor to isolate the consumer's water system from the purveyor's distribution system.

(195) **"Presedimentation"** means a preliminary treatment process used to remove gravel, sand, and other particulate material from the source water through settling before the water enters the primary clarification and filtration processes in a treatment plant.

(196) **"Pressure filter"** means an enclosed vessel containing properly sized and graded granular media through which water is forced under greater than atmospheric pressure.

(197) **"Primary disinfection"** means a treatment process for achieving inactivation of *Giardia lamblia* cysts, viruses, or other pathogenic organisms of public health concern to comply with the treatment technique requirements of Part 6 of this chapter.

(198) **"Primary standards"** means standards based on chronic, nonacute, or acute human health effects.

(199) **"Primary turbidity standard"** means an accurately prepared formazin solution or commercially prepared polymer solution of known turbidity (prepared in accordance with

"standard methods") that is used to calibrate bench model and continuous turbidimeters (instruments used to measure turbidity).

(200) **"Project approval application (PAA)"** means a department form documenting ownership of water system, design engineer for the project, and type of project.

(201) **"Protected groundwater source"** means a groundwater source the purveyor shows to the department's satisfaction as protected from potential sources of contamination on the basis of hydrogeologic data and/or satisfactory water quality history.

(202) **"psi"** means pounds per square inch.

(203) **"Public forum"** means a meeting open to the general public that allows for their participation.

(204) **"Public water system"** is defined and referenced under WAC [246-290-020](#).

(205) **"Purchased source"** means water a purveyor purchases from a public water system not under the control of the purveyor for distribution to the purveyor's consumers.

(206) **"Purveyor"** means an agency, subdivision of the state, municipal corporation, firm, company, mutual or cooperative association, institution, partnership, or person or other entity owning or operating a public water system. Purveyor also means the authorized agents of these entities.

(207) **"PVBA"** means a pressure vacuum breaker assembly.

(208) **"RAA"** means the running annual average.

(209) **"Reclaimed water"** means effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for beneficial use or a controlled use that would not otherwise occur, and it is no longer considered wastewater.

(210) **"Record drawings"** means the drawings bearing the seal and signature of a professional engineer that reflect the modifications made to construction documents, documenting actual constructed conditions of the water system facilities.

(211) **"Recreational tract"** means an area that is clearly defined for each occupant, but has no permanent structures with internal plumbing, and the area has been declared in the covenants or on the recorded plat in order to be eligible for reduced design considerations.

(212) **"Regional public water supplier"** means a water system that provides drinking water to one, or more, other public water systems.

(213) **"Regularly"** means four hours or more per day for four days or more per week.

(214) **"Removal credit"** means the level (expressed as a percent or log) of *Giardia* and virus removal the department grants a system's filtration process.

(215) **"Repeat sample"** means a sample collected to confirm the results of a previous analysis.

(216) **"Resident"** means an individual living in a dwelling unit served by a public water system.

(217) **"Residual disinfectant concentration"** means the analytical level of a disinfectant, measured in milligrams per liter, that remains in water following the application (dosing) of the disinfectant after some period of contact time.

(218) **"Retail service area"** means the specific area defined by the municipal water supplier where the municipal water supplier has a duty to provide service to all new service connections as set forth in RCW [43.20.260](#).

(219) **"RPBA"** means reduced pressure backflow assembly.

(220) **"RPDA"** means reduced pressure detector assembly.

(221) **"SAL"** means state advisory level.

(222) **"Same farm"** means a parcel of land or series of parcels that are connected by covenants and devoted to the production of livestock or agricultural commodities for commercial purposes and does not qualify as a **Group A** public water system.

(223) **"Sanitary defect"** means a defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place.

(224) **"Sanitary survey"** means a review, inspection, and assessment of a public water system, by the department or department designee, to determine the adequacy of the system and its operation for producing and distributing safe and reliable drinking water. Each survey includes, but is not limited to, an evaluation of the following components:

- (a) Source;
- (b) Treatment;
- (c) Distribution system;
- (d) Finished water storage;
- (e) Pump, pump facilities, and controls;
- (f) Monitoring, reporting, and data verification;
- (g) System management and operation; and
- (h) Operator compliance.

(225) **"Satellite system management agency (SMA)"** means a person or entity that is approved by the department to own or operate public water systems on a regional or county-wide basis without the necessity for a physical connection between the systems.

(226) **"SCA"** means a sanitary control area.

(227) **"SDWA"** means the Safe Drinking Water Act.

(228) **"Seasonal source"** means a public water system source used on a regular basis, that is not a permanent or emergency source.

(229) **"Seasonal system"** means a noncommunity water system defined and referenced under WAC [246-290-020](#) that is not operated as a public water system on a year-round basis and starts up and shuts down at the beginning and end of each operating season.

(230) **"Secondary standards"** means standards based on factors other than health effects.

(231) **"SEPA"** means the State Environmental Policy Act.

(232) **"Service area"** means the specific area a water system currently serves and areas where future water service is planned. A wholesale system may include areas where it provides wholesale water to other public water systems in its service area. A water system in a CWSSA includes its future service area in its service area as "future service area" as defined under chapters [70.116 RCW](#) and [246-293 WAC](#).

(233) **"Service connection"** means a connection to a public water system designed to provide potable water to a single family residence, or other residential or nonresidential population. When the connection provides water to a residential population without clearly defined single family residences, the following formulas shall be used in determining the number of services to be included as residential connections on the WFI form:

- (a) Divide the average population served each day by two and one-half; or
- (b) Using actual water use data, calculate the total ERUs represented by the service connection in accordance with department design guidance.
- (c) In no case shall the calculated number of services be less than one.

(234) **"Severe health cross-connection hazard"** means a cross-connection which could impair the quality of potable water and create an immediate, severe public health hazard



through poisoning or spread of disease by contaminants from radioactive material processing plants, nuclear reactors, or wastewater treatment plants.

(235) "**Simple disinfection**" means any form of disinfection that requires minimal operational control in order to maintain the disinfection at proper functional levels, and that does not pose safety concerns that would require special care, equipment, or expertise. Examples include hypochlorination, UV-light, contactor chlorination, or any other form of disinfection practice that is safe to use and easy to routinely operate and maintain.

(236) "**Slow sand filtration**" means a process involving passage of source water through a bed of sand at low velocity (generally less than 0.10 gpm/ft<sup>2</sup>) that results in substantial particulate removal (> 2-log *Giardia lamblia* cysts) by physical and biological mechanisms.

(237) "**SMA**" means a satellite system management agency.

(238) "**SOC**" means a synthetic organic chemical.

(239) "**Societal perspective**" means:

A point of view that includes a broad spectrum of public benefits including, but not limited to:

- (a) Enhanced system reliability;
- (b) Savings that result from delaying, deferring, or minimizing capital costs; and
- (c) Environmental benefits such as increased water in streams, improvements in aquifer recharge and other environmental factors.

(240) "**Source meter**" means a meter that measures total output of a water source over specific time periods.

(241) "**Source water**" means untreated water that is not subject to recontamination by surface runoff and:

- (a) For unfiltered systems, enters the system immediately before the first point of disinfectant application; and
- (b) For filtered systems, enters immediately before the first treatment unit of a water treatment facility.

(242) "**SPI**" means a special purpose investigation.

(243) "**Special purpose investigation (SPI)**" means on-site inspection of a public water system by the department or designee to address a potential public health concern, regulatory violation, or consumer complaint.

(244) "**Special purpose sample**" means a sample collected for reasons other than the monitoring compliance specified in this chapter.

(245) "**Spring**" means a source of water where an aquifer comes in contact with the ground surface.

(246) "**SRF**" means the state revolving fund.

(247) "**SSNC**" means state significant noncomplier.

(248) "**Standard methods**" means the book, titled *Standard Methods for the Examination of Water and Waste Water*, jointly published by the American Public Health Association, American Water Works Association (AWWA), and Water Pollution Control Federation. This book is available through public libraries or may be ordered from AWWA, 6666 West Quincy Avenue, Denver, Colorado 80235. The edition to be used is that specified by EPA for the relevant drinking water parameter in 40 C.F.R. Part 141.

(249) "**Standby storage**" means the volume of stored water available for use during a loss of source capacity, power, or similar short-term emergency.

(250) **"State advisory level (SAL)"** means a level established by the department and state board of health for a contaminant without an existing MCL. The SAL represents a level that when exceeded, indicates the need for further assessment to determine if the chemical is an actual or potential threat to human health.

(251) **"State board of health" and "board"** means the board created by RCW **43.20.030**.

(252) **"State building code"** means the codes adopted by and referenced in chapter **19.27** RCW; the state energy code; and any other codes so designated by the Washington state legislature as adopted and amended by the council.

(253) **"State revolving fund (SRF)"** means the revolving loan program financed by the state and federal governments and managed by the state for the purpose of assisting water systems to meet their capital needs associated with complying with the federal Safe Drinking Water Act under chapter **246-296** WAC.

(254) **"State significant noncomplier (SSNC)"** means a system that is violating or has violated department rules, and the violations may create, or have created an imminent or a significant risk to human health.

The violations include, but are not limited to:

- (a) Repeated violations of monitoring requirements;
- (b) Failure to address an exceedance of permissible levels of regulated contaminants;
- (c) Failure to comply with treatment technique standards or requirements;
- (d) Failure to comply with waterworks operator certification requirements; or
- (e) Failure to submit to a sanitary survey.

(255) **"Subpart H System"** see definition for **"surface water system."**

(256) **"Surface water"** means a body of water open to the atmosphere and subject to surface runoff.

(257) **"Surface water system"** means a public water system that uses in whole, or in part, source water from a surface supply, or GWI supply. This includes systems that operate surface water treatment facilities, and systems that purchase "completely treated water". A "surface water system" is also referred to as a "Subpart H System" in some federal regulatory language adopted by reference and the two terms are considered equivalent for the purposes of this chapter.

(258) **"Susceptibility assessment"** means the completed Susceptibility Assessment Survey Form developed by the department to evaluate the hydrologic setting of the water source and assess its contribution to the source's overall susceptibility to contamination from surface activities.

(259) **"SUVA"** means specific ultraviolet absorption.

(260) **"SVBA"** means spill resistant vacuum breaker assembly.

(261) **"SWTR"** means the surface water treatment rule.

(262) **"Synthetic organic chemical (SOC)"** means a manufactured carbon-based chemical.

(263) **"System capacity"** means the system's operational, technical, managerial, and financial capability to achieve and maintain compliance with all relevant local, state, and federal plans and regulations.

(264) **"System physical capacity"** means the maximum number of service connections or equivalent residential units (ERUs) that the system can serve when considering the limitation of each system component such as source, treatment, storage, transmission, or distribution, individually and in combination with each other.

(265) **"T"** means disinfectant contact time in minutes.

(266) **"Time-of-travel"** means the time required for groundwater to move through the water bearing zone from a specific point to a well.

(267) **"TNC"** means transient noncommunity.

(268) **"TNTC"** means too numerous to count.

(269) **"TOC"** means total organic carbon.

(270) **"Too numerous to count (TNTC)"** means the total number of bacterial colonies exceeds 200 on a 47-mm diameter membrane filter used for coliform detection.

(271) **"Tracer study"** means a field study conducted to determine the disinfectant contact time, T, provided by a water system component, such as a clearwell or storage reservoir, used for *Giardia lamblia* cyst and virus inactivation. The study involves introducing a tracer chemical at the inlet of the contact basin and measuring the resulting outlet tracer concentration as a function of time.

(272) **"Transmission line"** means pipes used to convey water from source, storage, or treatment facilities to points of distribution or distribution mains, and from source facilities to treatment or storage facilities. This also can include transmission mains connecting one section of distribution system to another section of distribution system as long as this transmission main is clearly defined on the plans and no service connections are allowed along the transmission main.

(273) **"Treatment technique requirement"** means a department-established requirement for a public water system to provide treatment, such as filtration or disinfection, as defined by specific design, operating, and monitoring requirements. A "treatment technique requirement" is established in lieu of a primary MCL when monitoring for the contaminant is not economically or technologically feasible.

(274) **"Triggered source water monitoring"** means collection of groundwater source samples as a result of a total coliform-positive routine sample in the distribution system under WAC [246-290-300\(3\)](#).

(275) **"Trihalomethane (THM)"** means one of a family of organic compounds, named as derivatives of methane, where three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure. THMs may occur when chlorine, a halogen, is added to water containing organic material and are generally found in water samples as disinfection byproducts.

(276) **"TTHM"** means total trihalomethane.

(277) **"Turbidity event"** means a single day or series of consecutive days, not to exceed fourteen, when one or more turbidity measurement each day exceeds 5 NTU.

(278) **"Two-stage lime softening"** means a process in which chemical addition and hardness precipitation occur in each of two distinct unit clarification processes in series prior to filtration.

(279) **"T10"** means the time it takes ten percent of the water passing through a system contact tank intended for use in the inactivation of *Giardia lamblia* cysts, viruses, and other microorganisms of public health concern, as determined from a tracer study conducted at peak hourly flow or from published engineering reports or guidance documents for similarly configured tanks.

(280) **"ug/L"** means micrograms per liter.

(281) **"UL"** means the Underwriters Laboratories, Inc.

(282) **"umhos/cm"** means micromhos per centimeter.

(283) **"Unapproved auxiliary water supply"** means a water supply (other than the purveyor's water supply) on or available to the consumer's premises that is either not approved for human consumption by the health agency having jurisdiction or is not otherwise acceptable to the purveyor.

(284) **"Uncovered finished water storage facility"** means a tank, reservoir, or other facility used to store water, which will undergo no further treatment to reduce microbial pathogens except residual disinfection and is directly open to the atmosphere without a suitable water-tight roof or cover.

(285) **"Uniform Plumbing Code (UPC)"** means the code adopted under RCW **19.27.031**(4) and implemented under chapter **51-56** WAC. This code establishes statewide minimum plumbing standards applicable within the property lines of the consumer's premises.

(286) **"UPC"** means the Uniform Plumbing Code.

(287) **"Used water"** means water which has left the control of the purveyor.

(288) **"UTC"** means the utilities and transportation commission.

(289) **"Verification"** means to demonstrate the results of a sample to be precise by analyzing a duplicate sample. Verification occurs when analysis results fall within plus or minus thirty percent of the original sample.

(290) **"Virus"** means a virus of fecal origin which is infectious to humans and transmitted through water.

(291) **"VOC"** means a volatile organic chemical.

(292) **"Volatile organic chemical (VOC)"** means a manufactured carbon-based chemical that vaporizes quickly at standard pressure and temperature.

(293) **"Voluntary curtailment"** means a curtailment of water use requested, but not required of consumers.

(294) **"WAC"** means the Washington Administrative Code.

(295) **"Waterborne disease outbreak"** means the significant occurrence of acute infectious illness, epidemiologically associated with drinking water from a public water system, as determined by the appropriate local health agency or the department.

(296) **"Water demand efficiency"** means minimizing water use by the public water system's consumers through purveyor sponsored activities that may include, but are not limited to, distributing water saving devices, providing rebates or incentives to promote water efficient technologies or by providing water audits to homes, businesses, or landscapes.

(297) **"Water facilities inventory (WFI) form"** means the department form summarizing each public water system's characteristics.

(298) **"Water right"** means a certificated water right, water right permit, valid claim, or other authorization, on record with or accepted by the department of ecology, authorizing the beneficial use of water in accordance with all applicable state laws.

(299) **"Water right self-assessment"** means an evaluation of the legal ability of a water system to use water for existing or proposed usages in conformance with state water right laws. The assessment may be done by a water system, a purveyor, the department of ecology, or any combination thereof.

(300) **"Watershed"** means the region or area that:

- (a) Ultimately drains into a surface water source diverted for drinking water supply; and
- (b) Affects the physical, chemical, microbiological, and radiological quality of the source.

(301) **"Water shortage"** means a situation during which the water supplies of a system cannot meet normal water demands for the system, including peak periods.

(302) **"Water shortage response plan"** means a plan outlining policies and activities to be implemented to reduce water use on a short-term basis during or in anticipation of a water shortage.

(303) **"Water supply characteristics"** means the factors related to a public water system's source of water supply that may affect its availability and suitability to provide for both short-term and long-term needs.

Factors include, but are not limited to:

- (a) Source location;
- (b) Name of any body of water and water resource inventory area from which water is diverted or withdrawn;
- (c) Production capacity;
- (d) The source's natural variability;
- (e) The system's water rights for the source;
- (f) Other legal demands on the source such as water rights for other uses;
- (g) Conditions established to protect species listed under the Endangered Species Act in 50 C.F.R. 17.11;
- (h) Instream flow restrictions established under Title 173 WAC; and
- (i) Any conditions established by watershed plans approved under chapter **90.82** RCW and RCW **90.54.040**(1) or salmon recovery plans under chapter **77.85** RCW.

(304) **"Water supply efficiency"** means increasing a public water system's transmission, storage and delivery potential through activities that may include, but are not limited to:

- (a) System-wide water audits;
- (b) Documenting authorized uses;
- (c) Conducting leak surveys; and
- (d) Repairs on:
  - (i) Meters;
  - (ii) Lines;
  - (iii) Storage facilities; and
  - (iv) Valves.

(305) **"Water use efficiency (WUE)"** means increasing water supply efficiency and water demand efficiency to minimize water withdrawals and water use.

(306) **"Water use efficiency program"** means policies and activities focusing on increasing water supply efficiency and water demand efficiency to minimize water withdrawals and water use.

(307) **"Well field"** means a group of wells one purveyor owns or controls that:

(a) Draw from the same aquifer or aquifers as determined by comparable inorganic chemical analysis and comparable static water level and top of the open interval elevations; and

(b) Discharge water through a common pipe and the common pipe shall allow for collection of a single sample before the first distribution system connection.

(308) **"Wellhead protection area (WHPA)"** means the portion of a well's, wellfield's or spring's zone of contribution defined using WHPA criteria established by the department.

(309) **"WFI"** means a water facilities inventory form.

(310) **"Wholesale system"** means a public water system that treats source water as necessary to produce finished water and then delivers some or all of that finished water to

another public water system. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

(311) "**WHPA**" means a wellhead protection area.

(312) "**WUE**" means water use efficiency.

(313) "**Zone of contribution**" means the area surrounding a pumping well or spring that encompasses all areas or features that supply groundwater recharge to the well or spring.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-010, filed 12/14/16, effective 1/14/17; WSR 10-20-068, § 246-290-010, filed 9/29/10, effective 11/1/10. Statutory Authority: RCW **43.20.050**. WSR 09-21-045, § 246-290-010, filed 10/13/09, effective 1/4/10. Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-010, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **70.119A.180**. WSR 07-02-025B, § 246-290-010, filed 12/22/06, effective 1/22/07. Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 04-04-056, § 246-290-010, filed 1/30/04, effective 3/1/04. Statutory Authority: RCW **43.20.050** (2) and (3) and **70.119A.080**. WSR 03-08-037, § 246-290-010, filed 3/27/03, effective 4/27/03. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-010, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 94-14-001, § 246-290-010, filed 6/22/94, effective 7/23/94; WSR 93-08-011 (Order 352B), § 246-290-010, filed 3/25/93, effective 4/25/93; WSR 92-04-070 (Order 241B), § 246-290-010, filed 2/4/92, effective 3/6/92. Statutory Authority: Chapter **43.20** RCW. WSR 91-07-031 (Order 150B), § 246-290-010, filed 3/15/91, effective 4/15/91. Statutory Authority: RCW **43.20.050**. WSR 91-02-051 (Order 124B), recodified as § 246-290-010, filed 12/27/90, effective 1/31/91. Statutory Authority: P.L. 99-339. WSR 89-21-020 (Order 336), § 248-54-015, filed 10/10/89, effective 11/10/89. Statutory Authority: RCW **34.04.045**. WSR 88-05-057 (Order 307), § 248-54-015, filed 2/17/88. Statutory Authority: RCW **43.20.050**. WSR 83-19-002 (Order 266), § 248-54-015, filed 9/8/83.]

## WAC 246-290-020

### Applicability.

(1) Public water system shall mean any system providing water for human consumption through pipes or other constructed conveyances, excluding a system serving only one single-family residence and a system with four or fewer connections all of which serve residences on the same farm. This term includes:

(a) Collection, treatment, storage, and/or distribution facilities under control of the purveyor and used primarily in connection with the system; and

(b) Collection or pretreatment storage facilities not under control of the purveyor, but primarily used in connection with the system.

(2) The rules of this chapter shall apply to all **Group A** public water systems except those systems meeting all of the following conditions:

(a) Consists only of distribution and/or storage facilities and does not have any source or treatment facilities;

(b) Obtains all water from, but is not owned by, a public water system where the rules of this chapter apply;

(c) Does not sell water directly to any person; and

(d) Is not a passenger-conveying carrier in interstate commerce.

(3) **Group A** public water systems meeting all of the provisions under subsection (2) of this section may be required by the department to comply with such provisions of this chapter as are necessary to resolve a public health concern if the department determines a public health threat exists or is suspected.

(4) A **Group A** system shall be defined as a public water system providing service such that it meets the definition of a public water system provided in the 1996 amendments to the federal Safe Drinking Water Act (Public Law 104-182, Section 101, subsection b).

(5) **Group A** water systems are further defined as **community** and **noncommunity** water systems.

(a) **Community** water system means any **Group A** water system providing service to fifteen or more service connections used by year-round residents for one hundred eighty or more days within a calendar year, regardless of the number of people, or regularly serving at least twenty-five year-round (i.e., more than one hundred eighty days per year) residents.

Examples of a **community** water system might include a municipality, subdivision, mobile home park, apartment complex, college with dormitories, nursing home, or prison.

(b) **Noncommunity** water system means a **Group A** water system that is not a **community** water system. **Noncommunity** water systems are further defined as:

(i) **Nontransient (NTNC)** water system that provides service opportunity to twenty-five or more of the same nonresidential people for one hundred eighty or more days within a calendar year.

Examples of a **NTNC** water system might include a school, day care center, or a business, factory, motel, or restaurant with twenty-five or more employees on-site.

(ii) **Transient (TNC)** water system that serves:

(A) Twenty-five or more different people each day for sixty or more days within a calendar year;

(B) Twenty-five or more of the same people each day for sixty or more days, but less than one hundred eighty days within a calendar year; or

(C) One thousand or more people for two or more consecutive days within a calendar year.

Examples of a **TNC** water system might include a restaurant, tavern, motel, campground, state or county park, an RV park, vacation cottages, highway rest area, fairground, public concert facility, special event facility, or church.

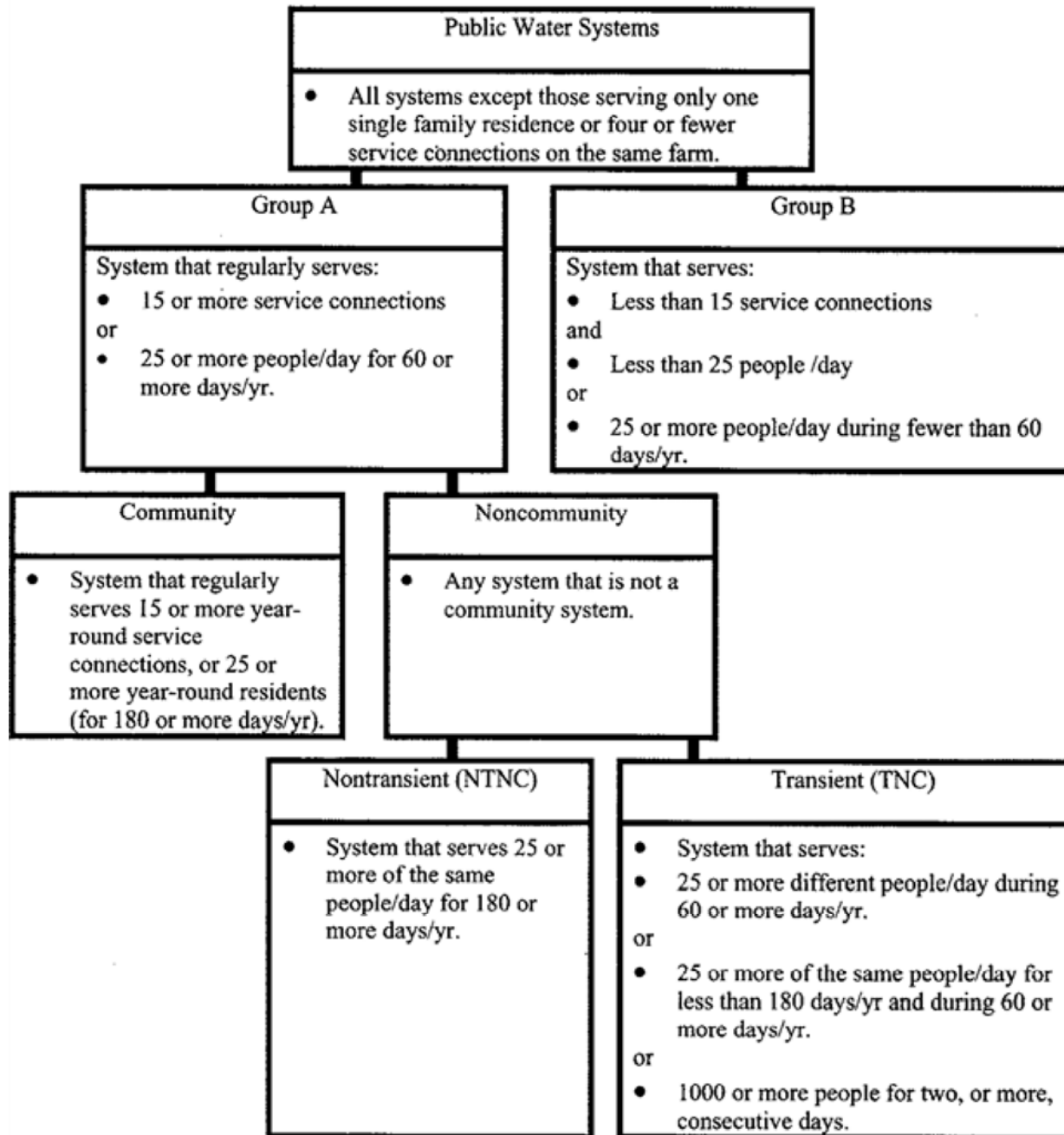
(c) A **Group B** water system is a public water system that does not meet the definition of a **Group A** water system. (See Table 1 and chapter **246-291** WAC for further explanation of a **Group B** water system.)

(6) A **Group A** system meeting more than one of the categories described in this section shall be classified by the department in the following order:

- (a) **Community** water system;
- (b) **NTNC** water system; or
- (c) **TNC** water system.



Table 1



[Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-020, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-020, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 94-14-001, § 246-290-020, filed 6/22/94, effective 7/23/94; WSR 93-08-011 (Order 352B), § 246-290-020, filed 3/25/93, effective 4/25/93; WSR 91-02-051 (Order 124B), recodified as § 246-290-020, filed 12/27/90, effective 1/31/91. Statutory Authority: P.L. 99-339. WSR 89-21-020 (Order 336), § 248-54-006, filed 10/10/89, effective 11/10/89.]

## WAC 246-290-025

### Adoption by reference.

The following sections and subsections of Title 40 Code of Federal Regulations (C.F.R.) Part 141 National Primary Drinking Water Regulations and Part 143 National Secondary Drinking Water Regulations revised as of July 1, 2016, are adopted by reference:

141.2 Definitions. Only those definitions listed as follows:

- Action level;
- Corrosion inhibitor;
- Effective corrosion inhibitor residual;
- Enhanced coagulation;
- Enhanced softening;
- First draw sample;
- Haloacetic acids (five) (HAA5);
- Large water system;
- Lead service line;
- Maximum residual disinfectant level (MRDL);
- Maximum residual disinfectant level goal (MRDLG);
- Medium-size water system;
- Optimal corrosion control treatment;
- Service line sample;
- Single family structure;
- Small water system;
- Specific ultraviolet absorption (SUVA); and
- Total Organic Carbon (TOC).

141.13 Maximum contaminant levels for turbidity.

141.22 Turbidity sampling and analytical requirements.

141.23(a) - 141.23(j), Inorganic chemical excluding (i) sampling.  
(2)

141.23(m) - 141.23(o)

141.24(a) - 141.24(d), Organic chemicals, sampling and analytical requirements.

141.24 (f)(1) - 141.24 (f)(15),

141.24 (f)(18), 141.24 (f)(19),

141.24 (f)(21), 141.24 (f)(22)

141.24 (g)(1) - 141.24 (g)(9),

141.24 (g)(12) - 141.24 (g)(14),

141.24 (h)(1) - 141.24 (h)(11),

141.24 (h)(14) - 141.24 (h)(17)

141.24 (h)(20)

141.25(a), 141.25 (c) - (d), Analytical methods for radioactivity.

- 141.26 Monitoring frequency and compliance for radionuclides in community water systems.
- 141.31(d) Reporting requirements.
- 141.33(e) Record maintenance.
- 141.40 Monitoring requirements for unregulated contaminants.
- 141.61 Maximum contaminant levels for organic contaminants.
- 141.62, Maximum contaminant levels for excluding (b) inorganic contaminants.
- 141.63(e) Maximum contaminant levels (MCLs) for microbiological contaminants.
- 141.64 Maximum contaminant levels for disinfection byproducts.
- 141.65(c) Maximum Residual Disinfectant Levels.
- 141.66 Maximum contaminant levels for radionuclides.
- Control of Lead and Copper
- 141.80, General requirements. excluding (c) (3)(v)
- 141.81 Applicability of corrosion control treatment steps to small, medium-size and large water systems.
- 141.82(a) - 141.82(h) Description of corrosion control treatment requirements.
- 141.83 Source water treatment requirements.
- 141.84 Lead service line replacement requirements.
- 141.85 Public education and supplemental monitoring requirements.
- 141.86 (a) Monitoring requirements for lead and copper in tap water. - (f)
- 141.87 Monitoring requirements for water quality parameters.
- 141.88 Monitoring requirements for lead and copper in source water.
- 141.89 Analytical methods.
- 141.90, Reporting requirements. excluding (a) (4)
- 141.91 Recordkeeping requirements.

Disinfectants and Disinfection Byproducts  
(D/DBP)

- 141.130 General requirements.
- 141.131 Analytical requirements.
- 141.132, Monitoring requirements.  
excluding (c)
- (1)(i)
- 141.133 Compliance requirements.
- 141.134 Reporting and recordkeeping  
requirements.
- 141.135 Treatment technique for control  
of disinfection byproduct  
precursors.

Subpart O - Consumer Confidence Reports

- 141.153 (h) Contents of the reports.  
(6) and (7)

Enhanced Filtration and Disinfection - Systems  
Serving 10,000 or More People

- 141.175(b) Reporting and recordkeeping  
requirements.

Subpart Q - Public Notification of Drinking  
Water Violations

- 141.201, General public notification  
excluding (3) requirements.  
(ii) of Table 1
- 141.202, Tier 1 Public Notice - Form,  
excluding manner, and frequency of notice.  
(3) of Table 1
- 141.203 Tier 2 Public Notice - Form,  
manner, and frequency of notice.
- 141.204 Tier 3 Public Notice - Form,  
manner, and frequency of notice.
- 141.205 Content of the public notice.
- 141.206 Notice to new billing units or new  
customers.
- 141.207 Special notice of the availability  
of unregulated contaminant  
monitoring results.
- 141.208 Special notice for exceedances  
of the SMCL for fluoride.
- 141.211 Special notice for repeated  
failure to conduct monitoring of  
the source water for  
*Cryptosporidium* and for failure  
to determine bin classification or  
mean *Cryptosporidium* level.

Appendix A to Subpart Q of Part 141 - NPDWR  
violations and other situations requiring public  
notice

Appendix B to Subpart Q of Part 141 -  
Standard health effects language for public  
notification

Appendix C to Subpart Q of Part 141- List of  
acronyms used in public notification regulation

141.400 General requirements and  
applicability.

141.402(c) Groundwater source microbial  
monitoring and analytical  
methods.

141.403 (b) Treatment technique  
(3)(i) through requirements for groundwater  
(iii) systems.

Subpart T - Enhanced Filtration and  
Disinfection - Systems Serving Fewer Than  
10,000 People

141.530 - Disinfection profile and  
141.544 benchmark.

141.563 What follow-up action is my  
system required to take based  
on continuous turbidity  
monitoring?

141.570, What does Subpart T require  
excluding (c) that my system report to the  
state?

Subpart U - Initial Distribution System  
Evaluations

141.600 - Initial distribution system  
141.605 evaluations.

Subpart V - Stage 2 Disinfection Byproducts  
Requirements

141.620 - Stage 2 Disinfection Byproducts  
141.629, Requirements.  
excluding  
624

Subpart W - Enhanced Treatment for  
*Cryptosporidium*

141.700-722 Enhanced Treatment for  
*Cryptosporidium*

Subpart Y - Revised Total Coliform Rule

141.852 Analytical methods and  
laboratory certification.

141.860 Violations  
(c) - (d)

Part 143 - National Secondary Drinking Water  
Regulations

143.1 Purpose.

143.2 Definitions.

143.3 Secondary maximum  
contaminant levels.

## 143.4 Monitoring.

Copies of the incorporated sections and subsections of Title 40 C.F.R. are available from the Department of Health online at:  
<http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/RegulationandCompliance/> or P.O. Box 47822, Olympia, Washington 98504-7822, or by calling the department's drinking water hotline at 800-521-0323.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-025, filed 12/14/16, effective 1/14/17. Statutory Authority: RCW **43.20.050**(2) and **70.119A.080**. WSR 11-17-062, § 246-290-025, filed 8/15/11, effective 10/1/11. Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 10-20-068, § 246-290-025, filed 9/29/10, effective 11/1/10. Statutory Authority: RCW **43.20.050**. WSR 09-21-045, § 246-290-025, filed 10/13/09, effective 1/4/10. Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-025, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 04-04-056, § 246-290-025, filed 1/30/04, effective 3/1/04. Statutory Authority: RCW **43.20.050** (2) and (3) and RCW **70.119A.080**. WSR 03-08-037, § 246-290-025, filed 3/27/03, effective 4/27/03. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-025, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 94-14-001, § 246-290-025, filed 6/22/94, effective 7/23/94.]

## WAC 246-290-030

### General administration.

(1) The department and the health officer for each local health jurisdiction may develop a joint plan of responsibility. Wherever in this chapter the term "department" is used, the term "health officer" may be substituted based on the terms of this joint plan of responsibility. This plan shall:

- (a) List the roles and responsibilities of each agency;
  - (b) Specifically designate those **Group A** systems for which the department and local health officer have primary responsibility;
  - (c) Provide for an agreed-to level of public water system oversight;
  - (d) Be signed by the department and the local health department or district; and
  - (e) Be reviewed at least once every five years and updated as needed.
- (2) The department shall, upon request, review and report on the adequacy of water supply supervision to both the state and local boards of health.

(3) The local board of health may adopt rules governing **Group A** water systems within its jurisdiction for which the health officer has assumed primary responsibility. Adopted local board of health rules shall be:

- (a) No less stringent than this chapter; and
- (b) Revised, if necessary, within twelve months after the effective date of revised state board of health rules. During this time period, existing local rules shall remain in effect, except provisions of the revised state board of health rules that are more stringent than the local board of health rules shall apply.

(4) For those **Group A** water systems where the health officer has assumed primary responsibility, the health officer may approve project reports and construction documents in accordance with engineering criteria approved by the department and listed under Part 3 of this chapter and water system plans in accordance with planning criteria listed under WAC **246-290-100**.

(5) The department may develop guidance to clarify sections of the rules as needed and make these available for distribution. Guidance may be obtained by contacting the office of drinking water.

(6) Fees may be charged and collected by the department as authorized in chapter **43.20B** RCW and by local health jurisdictions as authorized in RCW **70.05.060** to recover all or a portion of the costs incurred in administering this chapter or that are required to be paid under WAC **246-290-990**.

(7) All state and local agencies involved in review, approval, surveillance, testing, or operation of public water systems, or issuance of permits for buildings or sewage systems shall be governed by these rules and any decisions of the department.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-030, filed 12/14/16, effective 1/14/17. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-030, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 94-14-001, § 246-290-030, filed 6/22/94, effective 7/23/94; WSR 93-08-011 (Order 352B), § 246-290-030, filed 3/25/93, effective 4/25/93; WSR 91-02-051 (Order 124B), recodified as § 246-290-030, filed 12/27/90, effective 1/31/91. Statutory Authority: P.L. 99-339. WSR 89-21-020 (Order 336), § 248-54-025, filed 10/10/89, effective 11/10/89. Statutory Authority: RCW

**34.04.045.** WSR 88-05-057 (Order 307), § 248-54-025, filed 2/17/88. Statutory Authority:  
RCW **43.20.050.** WSR 83-19-002 (Order 266), § 248-54-025, filed 9/8/83.]



## WAC 246-290-035

### Water system ownership.

(1) The following requirements apply to all newly developed public water systems:

(a) Except for systems proposed within an existing water system's approved service area in a CWSSA and offered service by that existing system, any proposed new public water system must be owned or operated by a department approved satellite management agency (SMA) if one is available;

(b) The approval of any proposed new public water system shall be conditioned upon the periodic review of the system's operational history to determine its ability to meet the department's financial viability and other operating requirements. If, upon periodic review, the department determines the system is in violation of financial viability or other operating requirements, the system shall transfer ownership to an approved SMA or obtain operation and management by an approved SMA, if such ownership or operation and management can be made with reasonable economy and efficiency.

(2) An owner of a public water system who is proposing to transfer or has transferred ownership shall:

(a) Provide written notice to the department and all consumers at least one year prior to the transfer, unless the new owner agrees to an earlier date. Notification shall include a time schedule for transferring responsibilities, identification of the new owner, and under what authority the new ownership will operate. If the system is a corporation, identification of the registered agent shall also be provided;

(b) Ensure all health-related standards pursuant to this chapter are met during transfer of the utility. It shall also be the responsibility of the utility transferring ownership to inform and train the new owner regarding operation of the utility; and

(c) Comply with the operating permit requirements pursuant to chapter **246-294** WAC.

(3) The purveyor may be required to document compliance with other relevant ownership requirements, such as those pursuant to UTC jurisdiction under Title **80** RCW.

(4) No purveyor may end utility operations without providing written notice to all customers and to the department at least one year prior to termination of service. A purveyor that fails to provide such notice remains subject to the provisions of this chapter.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-035, filed 12/14/16, effective 1/14/17. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-035, filed 3/9/99, effective 4/9/99.]

## WAC 246-290-040

### Engineering requirements.

(1) Purveyors shall ensure that all work required to be prepared under the direction of a professional engineer, including, but not limited to, water system plans, project reports, corrosion control recommendation reports, tracer studies, construction documents and construction completion reports, and engineering design review reports for distribution-related submittal exceptions, is prepared under the direction, and bears the seal, date, and signature of a professional engineer:

- (a) Licensed in the state of Washington under chapter **18.43** RCW; and
- (b) Having specific expertise regarding design, operation, and maintenance of public water systems.

(2) Exceptions to this requirement are projects identified under WAC **246-290-125** (1) (a) through (d).

[Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-040, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 94-14-001, § 246-290-040, filed 6/22/94, effective 7/23/94; WSR 93-08-011 (Order 352B), § 246-290-040, filed 3/25/93, effective 4/25/93; WSR 91-02-051 (Order 124B), recodified as § 246-290-040, filed 12/27/90, effective 1/31/91. Statutory Authority: P.L. 99-339. WSR 89-21-020 (Order 336), § 248-54-035, filed 10/10/89, effective 11/10/89. Statutory Authority: RCW **34.04.045**. WSR 88-05-057 (Order 307), § 248-54-035, filed 2/17/88. Statutory Authority: RCW **43.20.050**. WSR 83-19-002 (Order 266), § 248-54-035, filed 9/8/83.]

## WAC 246-290-050

### Enforcement.

When any purveyor is out of compliance with a law or rule regulating public water systems and administered by the department, the department may initiate appropriate enforcement actions, regardless of any prior approvals issued. These actions may include, but are not limited to, any one or combination of the following:

- (1) Notice of violation instructing or requiring appropriate corrective measures;
- (2) Compliance schedule for specific actions necessary to achieve compliance status;
- (3) Departmental order requiring submission of project reports, construction documents, and construction report forms;
- (4) Departmental order requiring specific actions or ceasing unacceptable activities within a designated time period;
- (5) Departmental order to stop work and/or refrain from using any public water system or improvements thereto until all written approvals required by statute or rule are obtained;
- (6) Imposition of civil penalties may be issued for up to five thousand dollars per day per violation, or, in the case of a violation that has been determined to be a public health emergency, a penalty of not more than ten thousand dollars per day per violation under authority of chapter **70.119A** RCW;
- (7) Imposition of civil penalties may be issued to a person who constructs, modifies, or expands a public water system or who commences the construction, modification, or expansion of a public water system without first obtaining the required department approval. The amount of the penalty may be up to five thousand dollars per service connection, or, in the case of a system serving a transient population, a penalty of not more than four hundred dollars per person based on the highest average daily population the system serves or is anticipated to serve. The total penalty that may be imposed pursuant to this subsection and RCW **70.119A.040** (1)(b) is five hundred thousand dollars;
- (8) Action that requires the purveyor to take preventive or corrective steps when results of a sanitary survey or special purpose investigation conducted by, or on behalf of, the department indicate conditions that are currently or may become a detriment to system operation;
- (9) Legal action may be taken by the attorney general or local prosecutor. The legal action may be criminal or civil.

[Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-050, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 93-08-011 (Order 352B), § 246-290-050, filed 3/25/93, effective 4/25/93; WSR 91-02-051 (Order 124B), recodified as § 246-290-050, filed 12/27/90, effective 1/31/91. Statutory Authority: P.L. 99-339. WSR 89-21-020 (Order 336), § 248-54-045, filed 10/10/89, effective 11/10/89. Statutory Authority: RCW **34.04.045**. WSR 88-05-057 (Order 307), § 248-54-045, filed 2/17/88. Statutory Authority: RCW **43.20.050**. WSR 83-19-002 (Order 266), § 248-54-045, filed 9/8/83.]

## WAC 246-290-060

### Variations, exemptions, and waivers.

#### (1) General.

(a) The state board of health may grant variations, exemptions, and waivers of the requirements of this chapter according to the procedures outlined in subsection (5) of this section. See WAC **246-290-300** (4)(g) and (7)(f) for monitoring waivers.

(b) Consideration by the board of requests for variations, exemptions, and waivers shall not be considered adjudicative proceedings as that term is defined in chapter **34.05** RCW.

(c) Statements and written material regarding the request may be presented to the board at or before the public hearing where the application will be considered. Allowing cross-examination of witnesses shall be within the discretion of the board.

(d) The board may grant a variance, exemption, or waiver if it finds:

(i) Due to compelling factors, the public water system is unable to comply with the requirements; and

(ii) The granting of the variance, exemption, or waiver will not result in an unreasonable risk to the health of consumers.

#### (2) Variations.

##### (a) MCL.

(i) The board may grant a MCL variance to a public water system that cannot meet the MCL requirements because of characteristics of the source water that is reasonably available to the system.

(ii) A MCL variance may only be granted in accordance with 40 C.F.R. 141.4.

(iii) A variance shall not be granted from the MCL for presence of *E. coli* under WAC **246-290-310**(2).

##### (b) Treatment techniques.

(i) The board may grant a treatment technique variance to a public water system if the system demonstrates that the treatment technique is not necessary to protect the health of consumers because of the nature of the system's source water.

(ii) A treatment technique variance granted in accordance with 40 C.F.R. 141.4.

(iii) A variance shall not be granted from any treatment technique requirement under Part 6 of chapter **246-290** WAC.

(c) The board shall condition the granting of a variance upon a compliance schedule as described in subsection (6) of this section.

#### (3) Exemptions.

(a) The board may grant a MCL or treatment technique exemption to a public water system that cannot meet an MCL standard or provide the required treatment in a timely manner, or both, in accordance with 40 C.F.R. 141.4.

(b) No exemption shall be granted from:

(i) The requirement to provide a residual disinfectant concentration in the water entering the distribution system under WAC **246-290-662** or **246-290-692**; or

(ii) The MCL for presence of *E. coli* under WAC **246-290-310**(2).

(c) The board shall condition the granting of an exemption upon a compliance schedule as described in subsection (6) of this section.

(4) Waivers. The board may grant a waiver to a public water system if the system cannot meet the requirements of these regulations pertaining to any subject not covered by EPA variance and/or exemption regulations.

(5) Procedures.

(a) For variances and exemptions. The board shall consider granting a variance or exemption to a public water system in accordance with 40 C.F.R. 141.4.

(b) For waivers. The board shall consider granting a waiver upon completion of the following actions:

(i) The purveyor applies to the department in writing. The application, which may be in the form of a letter, shall clearly state the reason for the request;

(ii) The purveyor provides notice of the purveyor's application to consumers and provides proof of the notice to the department;

(iii) The department prepares a recommendation to the board; and

(iv) The board provides notice for and conducts a public hearing on the purveyor's request.

(6) Compliance schedule.

(a) The board shall condition the granting of a variance or exemption based on a compliance schedule. The compliance schedule shall include:

(i) Actions the purveyor shall undertake to comply with a MCL or treatment technique requirement within a specified time period; and

(ii) A description and time-table for implementation of interim control measures the department may require while the purveyor completes the actions required in (a)(i) of this subsection.

(b) The purveyor shall complete the required actions in the compliance schedule within the stated time frame.

(7) Extensions to variances and exemptions.

The board may extend the final date of compliance prescribed in the compliance schedule for a variance and/or exemption in accordance with 40 C.F.R. 141.4.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-060, filed 12/14/16, effective 1/14/17. Statutory Authority: RCW **43.20.050** (2) and (3) and **70.119A.080**. WSR 03-08-037, § 246-290-060, filed 3/27/03, effective 4/27/03. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-060, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 94-14-001, § 246-290-060, filed 6/22/94, effective 7/23/94; WSR 93-08-011 (Order 352B), § 246-290-060, filed 3/25/93, effective 4/25/93; WSR 91-02-051 (Order 124B), recodified as § 246-290-060, filed 12/27/90, effective 1/31/91. Statutory Authority: P.L. 99-339. WSR 89-21-020 (Order 336), § 248-54-055, filed 10/10/89, effective 11/10/89. Statutory Authority: RCW **34.04.045**. WSR 88-05-057 (Order 307), § 248-54-055, filed 2/17/88. Statutory Authority: RCW **43.20.050**. WSR 83-19-002 (Order 266), § 248-54-055, filed 9/8/83.]

**PART 2.**  
**PLANNING AND ENGINEERING DOCS**

**WAC 246-290-100****Water system plan.**

- (1) The purpose of this section is to establish a uniform process for purveyors to:
- (a) Demonstrate system capacity as defined in WAC **246-290-010**;
  - (b) Demonstrate how the system will address present and future needs in a manner consistent with other relevant plans and local, state, and federal laws, including applicable land use plans;
  - (c) Establish eligibility for funding under chapter **246-296** WAC.
- (2) Purveyors of the following categories of community public water systems shall submit a water system plan for review and approval by the department:
- (a) Systems serving one thousand or more service connections;
  - (b) Systems required to develop water system plans under the Public Water System Coordination Act of 1977 (chapter **70.116** RCW);
  - (c) Any system experiencing problems related to system capacity, as determined by the department;
  - (d) All new systems;
  - (e) Any system proposing to:
    - (i) Increase or otherwise modify the service area identified in a previously approved planning document; or
    - (ii) Increase the geographical area where direct service is provided if a planning or engineering document has not been previously approved; or
    - (iii) Install additions, extensions, or changes to existing source, storage, or transmission facilities and increase the approved number of service connections.
  - (f) Any system proposing to use the document submittal exception process in WAC **246-290-125**; or
  - (g) Any system operating under or proposing to operate under an unspecified number of service connections.
- (3) The purveyor shall work with the department to establish the relative priority and level of detail for each element of the water system plan. The priority and level of detail must be related to size, complexity, water supply characteristics, forecasted demand characteristics, past performance, planning history, and use of the water system. Project reports may be combined with a water system plan.
- (4) The purveyor shall, at a minimum, address the following elements in the water system plan:
- (a) Description of the water system, including:
    - (i) Ownership and management, including the current names, addresses, and telephone numbers of the owners, operators, and emergency contact persons for the system;
    - (ii) System history and background;
    - (iii) Related plans, such as coordinated water system plans, abbreviated coordinated water system plans, local land use plans, groundwater management plans, and basin plans;
    - (iv) Service area maps, including retail service area and future service area, if applicable, and areas where wholesale water is provided to other public water systems. Municipal water suppliers shall identify the area that will expand their water rights' place of use if the requirements under WAC **246-290-107** have been met;
    - (v) Service area characteristics, agreements, and policies;

- (vi) Satellite management, if applicable.
  - (b) Basic planning data, including:
    - (i) Current population, service connections, water use, and equivalent residential units;
  - and
  - (ii) Sufficient water production and consumption data to identify trends including the following elements:
    - (A) Monthly and annual production totals for each source, including water purchased from another public water system;
    - (B) Annual usage totals for each customer class as determined by the purveyor;
    - (C) Annual usage totals for water supplied to other public water systems; and
    - (D) For systems serving one thousand or more total connections, a description of the seasonal variations in consumption patterns of each customer class defined by the purveyor.
  - (iii) Designated land use, zoning, population, and water demand within the water system's service area for the plan approval period, and at least a twenty-year planning period.
  - (c) Demand forecasts, developed under WAC **246-290-221**, for the plan approval period, and at least a twenty-year planning period. These shall show future use with and without savings expected from the system's water use efficiency program.
  - (d) For systems serving one thousand or more total connections, a demand forecast for the plan approval period and at least a twenty-year planning period that projects demand if the measures deemed cost-effective per WAC **246-290-810** were implemented.
  - (e) System analysis, including:
    - (i) System design standards;
    - (ii) Water quality analysis;
    - (iii) Inventory and analysis of water system facilities; and
    - (iv) Summary of system deficiencies.
  - (f) Water resource analysis for the plan approval period and at least a twenty-year planning period, including:
    - (i) A water use efficiency program. Municipal water suppliers must meet the requirements in WAC **246-290-810**;
    - (ii) Source of supply analysis, which includes:
      - (A) An evaluation of water supply alternatives if additional water rights will be pursued within twenty years; and
      - (B) A narrative description of the system's water supply characteristics and the foreseeable effect from current and future use on the water quantity and quality of any body of water from which its water is diverted or withdrawn based on existing data and studies;
    - (iii) A water shortage response plan as a component of the reliability and emergency response requirements under WAC **246-290-420**;
    - (iv) Water right self-assessment;
    - (v) Water supply reliability analysis;
    - (vi) Interties; and
    - (vii) For systems serving one thousand or more total connections, an evaluation of opportunities for the use of reclaimed water, where they exist, as defined in RCW **90.46.120**.
  - (g) Source water protection program under WAC **246-290-135**.
  - (h) Operation and maintenance program under WAC **246-290-415** and **246-290-654**
- (5), as applicable.

(i) Improvement program, including a capital improvement schedule that identifies all capital improvements scheduled within the plan approval period and any major projects or other capital improvements planned within at least a twenty-year planning period.

(j) Financial program, including demonstration of financial viability by providing:

(i) A summary of past income and expenses;

(ii) A balanced operational budget for the plan approval period;

(iii) A plan for collecting the revenue necessary to maintain cash flow stability and to fund the capital improvement program and emergency improvements; and

(iv) An evaluation that has considered:

(A) The affordability of water rates; and

(B) The feasibility of adopting and implementing a rate structure that encourages water demand efficiency.

(k) Other documents, such as:

(i) Documentation of SEPA compliance;

(ii) Agreements; and

(iii) Comments from each local government with jurisdiction and adjacent utilities.

(5) Purveyors intending to implement the project report and construction document submittal exceptions authorized under WAC **246-290-125** must include:

(a) Standard construction specifications for distribution mains; and/or

(b) Design and construction standards for distribution-related projects, including:

(i) Description of project report and construction document internal review procedures, including engineering design review and construction completion reporting requirements;

(ii) Construction-related policies and requirements for external parties, including consumers and developers;

(iii) Performance and sizing criteria; and

(iv) General reference to construction materials and methods.

(6) Purveyors shall submit reports identifying the progress in developing their water system plans if required by the department.

(7) Purveyors shall transmit water system plans to adjacent utilities and each local government with jurisdiction, to assess consistency with ongoing and adopted planning efforts.

(8) Prior to department approval of a water system plan or a water system plan update, the purveyor shall:

(a) Hold an informational meeting for the water system consumers and notify consumers in a way that is appropriate to the size of the water system; and

(b) Obtain approval of the water system plan from the purveyor's governing body or elected governing board.

(9) Department approval of a water system plan is effective for ten years from the date of written approval unless:

(a) The purveyor requests and receives a plan approval period of less than ten years;

or

(b) The department requests an updated plan.

(10) The purveyor shall update the water system plan and obtain department approval at or before the expiration of the current plan approval if the system meets any of the conditions of subsection (2) of this section.

(11) Water system plan amendments. A purveyor may submit an amendment to its current approved water system plan for department approval at any time during the plan



approval period. Project reports may be included in a water system plan amendment to meet the requirements under WAC **246-290-110**(3). Department approval of a water system plan amendment does not alter the current plan approval period in accordance with subsection (9) of this section and does not satisfy the requirement of subsection (2) of this section to update the water system plan.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-100, filed 12/14/16, effective 1/14/17; WSR 10-20-068, § 246-290-100, filed 9/29/10, effective 11/1/10. Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-100, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **70.119A.180**. WSR 07-02-025B, § 246-290-100, filed 12/22/06, effective 1/22/07. Statutory Authority: RCW **43.20.050** (2) and (3) and **70.119A.080**. WSR 03-08-037, § 246-290-100, filed 3/27/03, effective 4/27/03. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-100, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 94-14-001, § 246-290-100, filed 6/22/94, effective 7/23/94; WSR 93-08-011 (Order 352B), § 246-290-100, filed 3/25/93, effective 4/25/93; WSR 91-02-051 (Order 124B), recodified as § 246-290-100, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW **34.04.045**. WSR 88-05-057 (Order 307), § 248-54-065, filed 2/17/88. Statutory Authority: RCW **43.20.050**. WSR 83-19-002 (Order 266), § 248-54-065, filed 9/8/83.]

## WAC 246-290-105

### Small water system management program.

- (1) The purpose of a small water system management program is to:
  - (a) Demonstrate the system's operational, technical, managerial, and financial capability to achieve and maintain compliance with all relevant local, state, and federal plans and regulations; and
  - (b) Establish eligibility for funding under chapter **246-296** WAC.
- (2) All noncommunity systems and community systems not required to complete a water system plan under WAC **246-290-100**(2) shall develop and implement a small water system management program.
  - (3) The purveyor shall submit this program for department review and approval when:
    - (a) A new NTNC public water system is created;
    - (b) An existing system has operational, technical, managerial, or financial problems, as determined by the department; or
    - (c) An existing system without approved construction documents is seeking as-built system approval under WAC **246-290-140**; or
    - (d) A system applies for funding under chapter **246-296** WAC.
  - (4) Content and detail shall be consistent with the size, complexity, past performance, and use of the public water system. General content topics shall include, but not be limited to, the following elements:
    - (a) System management;
    - (b) Annual operating permit;
    - (c) Water facilities inventory form;
    - (d) Service area and facility map. Municipal water suppliers shall identify the area that will expand their water rights' place of use if the requirements under WAC **246-290-107** have been met;
    - (e) Water right self-assessment;
    - (f) Description of the system's source(s) including the name and location of any body of water from which its water is diverted or withdrawn;
    - (g) A water use efficiency program. Municipal water suppliers must meet the requirements in WAC **246-290-810**;
    - (h) Water production and consumption data including each of the following:
      - (i) Monthly and annual production for each source, including water purchased from another public water system;
      - (ii) Annual consumption totals for residential and nonresidential connections;
      - (iii) Total annual volume of water supplied to other public water systems;
    - (i) Average daily demand;
    - (j) Current population served;
    - (k) The forecast of average daily demand based on the system's approved number of connections that considers:
      - (i) Water use trends based on actual water use records; and
      - (ii) Applicable land use plans;
    - (l) An evaluation that has considered the feasibility of adopting and implementing a rate structure that encourages water demand efficiency;
    - (m) Source water protection program;

- (n) Component inventory and assessment;
  - (o) List of planned system improvements;
  - (p) Water quality monitoring program;
  - (q) Operation and maintenance program under WAC **246-290-415(2)** and **246-290-654**
- (5) as applicable;
- (r) Cross-connection control program;
  - (s) Emergency response plan; and
  - (t) Budget.
- (5) The department may require changes be made to a small water system management program if necessary to effectively accomplish the program's purpose.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-105, filed 12/14/16, effective 1/14/17. Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-105, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **70.119A.180**. WSR 07-02-025B, § 246-290-105, filed 12/22/06, effective 1/22/07. Statutory Authority: RCW **43.20.050** (2) and (3) and **70.119A.080**. WSR 03-08-037, § 246-290-105, filed 3/27/03, effective 4/27/03. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-105, filed 3/9/99, effective 4/9/99.]

## **WAC 246-290-106**

### **Duty to provide service.**

Municipal water suppliers required to submit a water system plan for department approval under WAC **246-290-100**(2) must also include in the water system plan the provisions of this section as required under RCW **43.20.260**. In approving a water system plan, the department shall ensure that water service to be provided by the water system for any new industrial, commercial, or residential use is consistent with local plans and regulations.

(1) A municipal water supplier has a duty to provide retail water service to all new service connections within its retail service area if:

- (a) It can be available in a timely and reasonable manner;
- (b) There is sufficient water rights to provide water service;
- (c) There is sufficient capacity to serve the water in a safe and reliable manner as determined by the department; and
- (d) It is consistent with the requirements of local plans and regulations and, for water service by the water utility of a city or town, with the utility service extension ordinances of the city or town.

(2) Municipal water suppliers shall include a retail service area map in the water system plan.

(3) Municipal water suppliers must meet the requirements of WAC **246-290-108**.

(4) Municipal water suppliers shall include their service policies and conditions of service including how new service will be provided in the water system plan.

(5) Municipal water suppliers may provide temporary water service to another water system to resolve a significant public health and safety concern prior to meeting the requirements of this section.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-106, filed 12/14/16, effective 1/14/17. Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-106, filed 1/14/08, effective 2/14/08.]

## WAC 246-290-107

### Place of use expansion.

The place of use of a surface or groundwater right may be expanded to include any portion of the approved service area that was not previously within the place of use for the water right when documented in an approved planning or engineering document under chapter **43.20** RCW or in accordance with procedures adopted under chapter **70.116** RCW. This occurs as an effect of the department's approval of a service area identified in a water system plan, water system plan amendment, small water system management program, engineering document, or as an effect of the local legislative authority's approval of a service area as part of a coordinated water system plan.

(1) The following conditions must be met:

(a) The municipal water supplier is in compliance with the terms of the water system plan or small water system management program, including those regarding water use efficiency.

(b) The alteration of the place of use is not inconsistent regarding an area added to the place of use with any local plans and regulations.

(c) The alteration of the place of use is not inconsistent regarding an area added to the place of use with any watershed plan approved under chapter **90.82** RCW or a comprehensive watershed plan approved under RCW **90.54.040**(1) after September 3, 2003, if such a watershed plan has been approved for the area.

(2) As part of the planning or engineering document, municipal water suppliers must:

(a) Identify the area where the place of use will be expanded.

(b) Document that subsection (1)(a) and (c) of this section are met.

(c) Meet the requirements of WAC **246-290-108** for the area where the place of use will be expanded.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-107, filed 12/14/16, effective 1/14/17; WSR 10-20-068, § 246-290-107, filed 9/29/10, effective 11/1/10. Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-107, filed 1/14/08, effective 2/14/08.]

## **WAC 246-290-108**

### **Consistency with local plans and regulations.**

Consistency with local plans and regulations applies to planning and engineering documents under WAC [246-290-106](#), [246-290-107](#), and [246-290-110](#).

(1) Municipal water suppliers must include a consistency review and supporting documentation in its planning or engineering document describing how it has considered consistency with local plans and regulations. This review must include elements of local plans and regulations, as they reasonably relate to water service to be provided by a municipal water supplier for any new connection, including:

- (a) Land use and zoning within the service area;
- (b) Growth projections used in the demand forecast;
- (c) Utility service extension ordinances of a city or town when water service is provided by the water utility of the city or town;
- (d) Provisions of water service for new service connections; and
- (e) Other relevant elements related to water supply planning as determined by the department.

(2) Municipal water suppliers must request each local government with jurisdiction over the service area to provide a consistency review. Municipal water suppliers may exclude wholesale areas from the consistency review provided the water system receiving the wholesale water complies with the requirements for a consistency review when developing a water system plan for any new connection within the service area of the system receiving the wholesale water.

(a) Municipal water suppliers shall provide each local government with jurisdiction sixty days to review the planning or engineering document unless another state statute or state regulation requires a different time frame. The municipal water supplier must provide the local government with jurisdiction an additional thirty days for review if requested.

(b) If an inconsistency is documented by the local government with jurisdiction within the time frame outlined in (a) of this subsection, the municipal water supplier must provide the inconsistency information to the department.

(c) If the local government with jurisdiction documents in writing an inconsistency exists with local plans and regulations, the municipal water supplier shall address the inconsistency. The local government with jurisdiction shall be provided sixty days to review any revisions or responses that address the inconsistency.

(3) If the local government with jurisdiction does not provide a consistency review, the municipal water supplier shall complete the consistency review as described in subsection (1) of this section. The municipal water supplier must also document:

- (a) The amount of time provided to each local government with jurisdiction to review the planning and engineering documents as defined in subsection (2) of this section; and
- (b) The efforts taken to request a consistency review from the local government with jurisdiction.

[Statutory Authority: RCW [43.20.050](#) and [70.119A.080](#). WSR 17-01-062, § 246-290-108, filed 12/14/16, effective 1/14/17. Statutory Authority: RCW [70.119A.180](#) and [43.20.050](#). WSR 08-03-061, § 246-290-108, filed 1/14/08, effective 2/14/08.]

## WAC 246-290-110

### Project report.

(1) The project report is a written document that describes why a project is being proposed and includes engineering design calculations showing how the project will meet its objectives.

(2) Purveyors shall submit project reports to the department and obtain written approval prior to installation or construction of any new water system, water system extension, or improvement. The department may require the submittal of a project report for the purpose of resolving a system operational problem. Exceptions to this requirement are listed in WAC **246-290-125**.

(3) Project reports submitted for approval by purveyors who are required to have a water system plan will not be considered for approval unless a current, approved water system plan that adequately addresses the project is on file with the department. In the event that a purveyor of an existing system does not have such a water system plan, the department may enter into a compliance agreement with the purveyor that grants a time extension to complete the water system plan.

(4) Project reports shall be consistent with the standards identified in Part 3 of this chapter. Depending on the complexity and type of project or problem, the report shall include the following elements (information contained in a current water system plan or other engineering document previously approved by the department need not be duplicated, but must be specifically referenced):

- (a) Project description, including:
  - (i) Why the project is being proposed, how problem(s) (if any) are to be addressed, and the relationship of the project to other system components;
  - (ii) A statement of SEPA determination of nonsignificance or justification of why SEPA does not apply to project;
  - (iii) Source development information under WAC **246-290-130**, **246-290-132**, and **246-290-135**, if applicable;
  - (iv) Type of treatment under WAC **246-290-250**, if applicable; and
  - (v) A summary of consumer and user complaints.
- (b) Planning data. If a purveyor has a water system plan or small water system management program, the project report shall indicate the proposed project's relationship to the plan. If the purveyor is not required by WAC **246-290-100** to have a water system plan, planning related information shall include:
  - (i) General project background with population and water demand forecasts;
  - (ii) Service area map. Municipal water suppliers must identify where their water rights place of use will be expanded to their service area if the requirements under WAC **246-290-107** have been met;
  - (iii) How the project will impact neighboring water systems;
  - (iv) Local requirements, such as fire flow;
  - (v) Additional management responsibilities under WAC **246-290-105**, **246-290-415**, and chapter **246-292** WAC;
  - (vi) Implementation strategies or proposed construction schedule;
  - (vii) Estimated capital and annual operating cost, and method of financing, if applicable.

(c) An analysis of alternatives, including description of options and rationale for selecting the proposed option.

(d) A review of water quality as it relates to the purpose of the proposed project. If a project involves treatment and/or a filtration facility pilot study, refer to department guidance, reporting requirements for corrosion control under 40 C.F.R. 141.90, and tracer studies under WAC **246-290-636**(5).

(e) When the project involves a new source or an increase in system physical capacity, a review of water quantity, including a water rights assessment, unless the assessment has previously been submitted in a water system plan or small water system management program that has been approved by the department. The purveyor shall take any follow-up action as directed by the department, to determine conformance with applicable state water rights laws.

(f) Engineering calculations including sizing justification, hydraulic analysis, physical capacity analysis, and other relevant technical considerations necessary to support the project.

(g) Design and construction standards, including performance standards, construction materials and methods, and sizing criteria, if applicable.

(h) Project reports for the design of treatment facilities shall include the following:

(i) Detailed design criteria and calculations to support the proposed treatment processes, process control, and process utilities; and

(ii) Proposed methods and schedules for start up, testing, and operation of the completed treatment facility.

(i) Legal considerations, such as ownership, right of way, sanitary control area (SCA), restrictive covenants, restrictions related to water use that are recorded on titles or deeds to properties, and relationship with the boundary review board and UTC.

(j) Other necessary department-determined considerations.

[Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-110, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-110, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 94-14-001, § 246-290-110, filed 6/22/94, effective 7/23/94; WSR 93-08-011 (Order 352B), § 246-290-110, filed 3/25/93, effective 4/25/93; WSR 91-02-051 (Order 124B), recodified as § 246-290-110, filed 12/27/90, effective 1/31/91. Statutory Authority: P.L. 99-339. WSR 89-21-020 (Order 336), § 248-54-086, filed 10/10/89, effective 11/10/89. Statutory Authority: RCW **34.04.045**. WSR 88-05-057 (Order 307), § 248-54-086, filed 2/17/88.]



## WAC 246-290-120

### Construction documents.

(1) Construction documents shall identify how specific projects will be constructed while satisfying the requirements and conditions established in the project report and/or the water system plan.

(2) Purveyors shall submit construction documents to the department and obtain written approval prior to construction of any new water system, or water system extension or improvement. Exceptions to this requirement are listed in WAC [246-290-125](#).

(3) Construction documents submitted for approval by purveyors who are required to have a water system plan will not be considered for approval unless a current, approved water system plan that adequately addresses the project is on file with the department. In the event that a purveyor of an existing system does not have a water system plan, the department may enter into a compliance agreement with the purveyor that grants a time extension to complete the water system plan.

(4) Construction documents shall be consistent with the standards identified in Part 3 of this chapter and shall include, at a minimum, the following:

- (a) Drawings. Include detailed drawings of each project component;
- (b) Material specifications. List detailed material specifications for each project component;
- (c) Construction specifications.
  - (i) List detailed construction specifications and assembly techniques for carrying out the project;
  - (ii) Testing. Identify testing criteria and procedures for each applicable portion of the project;
  - (iii) Disinfection. Identify specific disinfection procedures that shall conform with AWWA standards or other standards acceptable to the department;
  - (iv) Inspection. Identify provisions for inspection of the installation of each project component. See WAC [246-290-040](#) and subsection (5) of this section for construction reporting requirements;
- (d) Change orders. All significant changes shall be submitted to and approved by the department in writing. The change order must identify who will be responsible for obtaining department approval and how change orders will be reported to the department. Significant means a change in materials used, deviations from original intent of project, or changes made to the physical capacity of the project;

(e) Record drawings. Record drawings provided to the purveyor following the completion of the project shall be maintained and available to the department upon request.

(5) Purveyors shall submit a construction completion report (department form) to the department within sixty days of completion and before use of distribution-related projects in accordance with WAC [246-290-125](#) (3)(f), or other project approved for construction by the department. Exceptions to this requirement are projects listed in WAC [246-290-125](#)(1). The form shall:

- (a) Bear the seal, date, and signature of a professional engineer licensed in the state of Washington;

(b) State the project is constructed and is completed in accordance with department regulations and principles of standard engineering practice, including physical testing procedures, water quality tests, and disinfection practices; and

(c) Document system physical capacity to serve consumers if the project results in a change (increase or decrease) in physical capacity.

(6) The purveyor shall submit a new or updated water facilities inventory (WFI) form (department form) with the construction completion report (department form) for a new water system, whenever there are changes or additions to an existing water system that would change information of the WFI, or when required by the department.

(7) If the project results in an increase in the water system's physical capacity, the purveyor shall submit a water right self-assessment, unless the assessment has previously been submitted in a project report, water system plan, or small water system management program, that has been approved by the department. The purveyor shall take any follow-up action, as directed by the department, to determine conformance with applicable state water rights laws.

(8) Approval of construction documents shall be in effect for two years unless the department determines a need to withdraw the approval. An extension of the approval may be obtained by submitting a status report and a written schedule for completion. Extensions may be subject to additional terms and conditions imposed by the department.

(9) Purveyors of new water systems must meet the ownership requirements of WAC **246-290-035** and the water system planning requirements of WAC **246-290-100** or **246-290-105** before the department will review and approve the purveyors' construction documents.

[Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-120, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-120, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 93-08-011 (Order 352B), § 246-290-120, filed 3/25/93, effective 4/25/93; WSR 91-02-051 (Order 124B), recodified as § 246-290-120, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW **34.04.045**. WSR 88-05-057 (Order 307), § 248-54-096, filed 2/17/88.]

## WAC 246-290-125

### Project report and construction document submittal exceptions.

(1) The following projects do not require project reports under WAC **246-290-110** and construction documents under WAC **246-290-120** to be submitted to the department for review and approval prior to installation:

(a) Installation of valves, fittings, meters, and approved backflow prevention assemblies;

(b) Installation of hydrants under WAC **246-290-230** (3) and (6);

(c) Repair of a system component or replacement with a component of a similar capacity and material in accordance with the original construction specifications of the approved design. For the purposes of replacing existing pipe, similar capacity includes one standard pipe size larger; or

(d) Maintenance or painting of surfaces not contacting potable water.

(2) Purveyors may elect to not submit to the department for review and approval project reports under WAC **246-290-110** and construction documents under WAC **246-290-120** for new distribution mains if:

(a) The purveyor has on file with the department a current department-approved water system plan that includes standard construction specifications for distribution mains; and

(b) The purveyor maintains on file a completed construction completion report (department form) in accordance with WAC **246-290-120**(5) and makes it available for review upon request by the department.

(3) Purveyors may elect to not submit to the department for review and approval project reports under WAC **246-290-110** and construction documents under WAC **246-290-120** for review and approval of other distribution-related projects as defined in WAC **246-290-010** providing:

(a) The purveyor has on file with the department a current department-approved water system plan, in accordance with WAC **246-290-100**(5);

(b) The purveyor submits a written request with a new water system plan or an amendment to a water system plan, and updates the request with each water system plan update. The written request should specifically identify the types of projects or facilities for which the submittal exception procedure is requested;

(c) The purveyor has documented that they have employed or hired under contract the services of a professional engineer licensed in the state of Washington to review distribution-related projects not submitted to the department for review and approval. The review engineer and design engineer shall not be the same individual. The purveyor shall provide written notification to the department whenever they propose to change their designated review engineer;

(d) If the project is a new transmission main, storage tank, or booster pump station, it must be identified in the capital improvement program of the utility's water system plan. If not, either the project report must be submitted to the department for review and approval, or the water system plan must be amended;

(e) A project summary file is maintained by the purveyor for each project and made available for review upon request by the department, and includes:

(i) Descriptive project summary;

(ii) Anticipated completion schedule;

- (iii) Consistency with utility's water system plan;
  - (iv) Water right self-assessment, where applicable;
  - (v) Change in system physical capacity;
  - (vi) Copies of original design and record drawings;
  - (vii) Engineering design review report (department form). The form shall:
    - (A) Bear the seal, date, and signature of a professional engineer licensed in the state of Washington prior to the start of construction;
    - (B) Provide a descriptive reference to completed project report and/or construction documents reviewed, including date of design engineer's seal and signature; and
    - (C) State the project report and/or construction documents have been reviewed, and the design is in accordance with department regulations and principles of standard engineering practice;
  - (f) The construction completion report is submitted to the department in accordance with WAC **246-290-120**(5) for new storage tanks and booster pump stations, and maintained on file with the water system for all other distribution-related projects;
  - (g) A WFI is completed in accordance with WAC **246-290-120**(6); and
  - (h) The purveyor meets the requirements of chapter **246-294** WAC to have a category "green" operating permit.
- (4) Source of supply (including interties) and water quality treatment-related projects shall not be eligible for the submittal exception procedure.
- (5) Purveyors not required to prepare a water system plan under WAC **246-290-100** shall be eligible for the submittal exception procedure if the purveyor:
- (a) Has a department-approved water system plan meeting the requirements of WAC **246-290-100**;
  - (b) Complies with all other requirements in this section; and
  - (c) Ensures that all work required to be prepared under the direction of a professional engineer be accomplished per WAC **246-290-040** and chapter **18.43** RCW.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-125, filed 12/14/16, effective 1/14/17. Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-125, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **43.20.050** (2) and (3) and **70.119A.080**. WSR 03-08-037, § 246-290-125, filed 3/27/03, effective 4/27/03. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-125, filed 3/9/99, effective 4/9/99.]

## WAC 246-290-130

### Source approval.

(1) Every purveyor shall obtain drinking water from the highest quality source feasible. No new source, previously unapproved source, or modification of an existing source shall be used as a public water supply without department approval. No intake or other connection shall be maintained between a public water system and a source of water not approved by the department.

(2) Before initiating source development or modification, the purveyor shall contact the department to identify submittal requirements.

(3) Any party seeking source approval shall provide the department sufficient documentation, in a project report, construction documents, or in supplemental documents, that the source:

- (a) Is reasonable and feasible for the type and size of the system;
- (b) May legally be used in conformance with state water rights laws;
- (c) Supplies water that is physically and reliably available in the necessary quantities, as shown in:
  - (i) A hydrogeologic assessment of the proposed source;
  - (ii) A general description of the watershed, spring, and/or aquifer recharge area affecting the quantity or quality of flow, which includes seasonal variation and upstream water uses that may significantly affect the proposed source;
  - (iii) For groundwater and spring sources, well source development data that are available from a pump test at the maximum design rate and duration, or are available from other sources of information, that establish pump settings (depth) in the well and demonstrate adequacy of water quantity to meet design criteria while not leading to water quality problems;
  - (iv) For groundwater and spring sources, installation of a source meter or other equivalent device that reliably measures volume of flow into the system;
  - (d) Is, or is not, a GWI under WAC [246-290-640](#), and meets or can meet the applicable requirements for GWI sources as described in that section including treatment;
  - (e) Adequately provides for source protection, as shown in:
    - (i) For surface water and GWI sources, the watershed control program identified under WAC [246-290-135](#) and Part 6 of this chapter;
    - (ii) For wells, a preliminary department susceptibility assessment or equivalent information, and preliminary WHPA delineation and contaminant inventory, under the requirements for sanitary control and wellhead protection under WAC [246-290-135](#);
  - (f) Is designed and constructed in conformance with this chapter, and relevant requirements of chapter [173-160](#) WAC (department of ecology well construction standards);
  - (g) Meets water quality standards under WAC [246-290-310](#), as shown in an initial water quality analysis that includes, at a minimum, the following:
    - (i) Bacteriological;
    - (ii) Complete inorganic chemical and physical except that the MCL for arsenic under WAC [246-290-310](#) does not apply to TNC systems;
    - (iii) Complete VOC;
    - (iv) Radionuclides, if source approval is requested for a community system;
    - (v) SOC, except where waived or not required under WAC [246-290-300](#); and

(vi) Any other information required by the department relevant to the circumstances of the particular source.

Sources that otherwise would not meet water quality standards may be approved if treatment is provided.

(4) The required documentation under subsection (3) of this section shall include, at a minimum:

- (a) A water right self-assessment;
- (b) A map showing the project location and vicinity;
- (c) A map depicting topography, distances to the surface water intake, well or spring from existing property lines, buildings, potential sources of contamination, ditches, drainage patterns, and any other natural or man-made features affecting the quality or quantity of water;

(d) The dimensions, location, and legal documentation of the SCA under WAC **246-290-135**;

(e) A copy of the on-site inspection form completed by the department or local health department representative;

(f) A copy of the water well report including the unique well identification tag number, depth to open interval or top of screened interval, overall depth of well from the top of the casing, vertical elevation, and location (both plat location and latitude/longitude); and

(g) Documentation of source meter installation. The purveyor may utilize other documents, such as a water system plan, susceptibility assessment, wellhead protection program, project report, or construction documents, to provide the documentation and information to the department, provided that the documents are current, and the purveyor indicates the location in the document of the relevant information.

(5) If treatment of a source is necessary to meet water quality standards, the purveyor may be required to meet the provisions of WAC **246-290-250** and Part 6 of this chapter, if applicable, prior to or as a condition of approval.

(6) An intertie must be adequately described in a written agreement between the purveyor and the supplier of the water, and otherwise meet the requirements of WAC **246-290-132**.

(7) The purveyor shall not construct facilities for source development and use without prior approval of the department pursuant to the provisions of WAC **246-290-120**.

(8) The purveyor may request a conditional source approval, such as one that sets limits on use or requires interim treatment, if further analysis of the quality of the source is required before final approval.

(9) For sources or supplies of water used by bottled water or ice plants to produce bottled water or ice:

(a) If the bottled water or ice plant is a Group A community water system and the plant uses the system's source for the water that is bottled or made into ice, the source and supply used for the bottled water and ice shall meet the applicable Group A requirements;

(b) If the bottled water or ice plant uses its own source for the water that is bottled or made into ice, and the plant is not a Group A community water system, the owner or operator shall obtain source approval from the department, and the source water shall meet the ongoing source water quality monitoring requirements for a Group A community system;

(c) If the bottled water or ice plant purchases the water for bottling or making ice from another source or supply, the water shall meet the minimum requirements for a Group A community water system, and the owner or operator of the plant shall ensure that the water meets the requirements;

(d) The source or supply for the water that is bottled or made into ice shall be protected from contamination prior to the bottling or ice making process; and

(e) In addition to the requirements imposed under this subsection, the processing of bottled water shall be subject to regulation by the state department of agriculture and the United States Food and Drug Administration.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-130, filed 12/14/16, effective 1/14/17; WSR 10-20-068, § 246-290-130, filed 9/29/10, effective 11/1/10. Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-130, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 04-04-056, § 246-290-130, filed 1/30/04, effective 3/1/04. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-130, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 94-14-001, § 246-290-130, filed 6/22/94, effective 7/23/94; WSR 93-08-011 (Order 352B), § 246-290-130, filed 3/25/93, effective 4/25/93. Statutory Authority: Chapter **43.20** RCW. WSR 91-07-031 (Order 150B), § 246-290-130, filed 3/15/91, effective 4/15/91. Statutory Authority: RCW **43.20.050**. WSR 91-02-051 (Order 124B), recodified as § 246-290-130, filed 12/27/90, effective 1/31/91. Statutory Authority: P.L. 99-339. WSR 89-21-020 (Order 336), § 248-54-097, filed 10/10/89, effective 11/10/89. Statutory Authority: RCW **34.04.045**. WSR 88-05-057 (Order 307), § 248-54-097, filed 2/17/88.]

## WAC 246-290-131

### Emergency sources and supplies.

(1) A purveyor with an emergency source shall provide, at a minimum, the following information in its department-approved emergency response program required under WAC **246-290-415** (2)(d):

- (a) Source name, department identification number, capacity, and location;
- (b) Engineering design department approval status;
- (c) Routine water quality emergency source monitoring schedule, if applicable; and
- (d) Procedures to activate the emergency source for the purpose of supplying the distribution system, including:
  - (i) Persons authorized to activate the source;
  - (ii) Conditions in which the emergency source will be activated;
  - (iii) Operational steps that will be taken before the source is activated;
  - (iv) Water quality sampling performed immediately before activating the source and while the emergency source is in operation; and
  - (v) Steps that will be taken to inform the public and the department before activating the source.

(2) A purveyor may maintain a physical connection between an emergency source and the distribution system if:

- (a) The emergency source is an emergency intertie with another Group A water system, approved under WAC **246-290-132**; or
- (b) The emergency source is a drilled and cased well which:
  - (i) Is identified in the purveyor's department-approved emergency response program in accordance with WAC **246-290-420**;
  - (ii) Has an isolation valve between the emergency source and the distribution system that is secured in the fully closed position when not in use; and
  - (iii) Has the motor starter locked-out and tagged-out in the off position so that the pump is isolated from the power supply when not in use.

(3) A purveyor with an emergency source that does not meet the requirements of subsection (2) of this section shall:

- (a) Physically disconnect the emergency source from the distribution system by the removal of a pipe segment or by an alternate means as determined by the department; and
- (b) Receive permission from the department or health officer before physically connecting and activating the emergency source for the purpose of supplying the distribution system.

(4) Unless otherwise directed by the department, a purveyor using trucked water as an emergency drinking water supply shall only use water that:

- (a) Originates from a Group A public water system that is in compliance with the requirements of this chapter;
- (b) Is treated with chlorine when the truck is filled by adding one-half cup of six to eight and twenty-five one hundredths of one percent regular unscented household bleach per one thousand gallons of water, or equivalent;
- (c) Has a free chlorine residual equal to or greater than 0.5 mg/L at the time of delivery; and



(d) Is collected, temporarily stored, and delivered by tanks, bladders, pumps, pipes and other equipment that:

(i) Are contaminant-free and constructed and maintained to prevent contamination; and

(ii) Have not previously been used to carry nonfood products, toxic substances, or petroleum products.

(5) Purveyors using trucked water as an emergency drinking water supply shall:

(a) Receive permission from the department, health officer, or local or state emergency management agency prior to use;

(b) Measure the free chlorine residual of the delivered water and only accept water that has a free chlorine residual that is equal to or greater than 0.5 mg/L at the time of delivery;

(c) Store trucked water in the delivery truck or in an approved component of the purveyor's water system; and

(d) Maintain records of trucked water deliveries, including the hauler, water source, chlorine test results, and delivery date, time, and volume. Records must be available for review upon request by the department or health officer.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-131, filed 12/14/16, effective 1/14/17.]

## WAC 246-290-132

### Interties.

(1) No interties shall be used and/or constructed as a public water supply without department approval.

(2) Interties shall not be eligible for submittal exceptions pursuant to WAC **246-290-125**.

(3) Prior to department approval, purveyors proposing nonemergency interties shall ensure that the intertie is addressed:

(a) In an approved coordinated water system plan, water system plan, water system plan update, water system plan amendment, or small water system management program including:

- (i) Location of the proposed intertie;
- (ii) Date it is proposed to be utilized;
- (iii) The purpose, physical capacity, service area, and proposed usage of the intertie;
- (iv) Copy of the intertie agreement between purveyors;
- (v) Description of how the intertie:
  - (A) Improves overall system reliability;
  - (B) Enhances the manageability of the system;
  - (C) Provides opportunities for conjunctive use; or
  - (D) Delays or avoids the need to develop new water sources;
- (vi) Identification of any potential public health or safety concerns;
- (vii) Discussion of any water quality and treatment issues;
- (viii) Demonstration of the source capacity and hydraulic capacity of the supplying and receiving systems at the designed flow rate through the intertie;
- (ix) Water right self-assessment;
- (x) Identification of alternative sources that will be utilized when the intertie agreement expires if the water is not being provided in perpetuity; and
- (xi) Identification and comparison of alternatives if any.

(b) In construction documents under WAC **246-290-120** including:

- (i) Demonstration of the installation of a source meter to measure water exchanged;
- and

(ii) Water right self-assessment, if not previously provided to the department. When RCW **90.03.383** requires a water right or water right change to be issued by the department of ecology, construction work on the intertie shall not begin, until the department of ecology issues the required water right document.

(4) Emergency use interties are interconnections between public water systems permitting the temporary exchange or delivery of water between those systems only in cases of emergency that result in permanent supplies being unavailable for use. Prior to department approval, purveyors proposing emergency use interties shall ensure that the emergency intertie is addressed:

(a) In an approved coordinated water system plan, water system plan, water system plan update, water system plan amendment, or small water system management program including:

- (i) Description of the intended use of the emergency intertie;
- (ii) Location of the proposed intertie;

- (iii) Date the intertie is intended to be operational;
  - (iv) Copy of the intertie agreement between purveyors detailing the conditions and limitations of the intertie; and
  - (v) Hydraulic analysis conducted to identify the impacts upon each water system.
- (b) In a project report under WAC **246-290-110** or in a construction document under WAC **246-290-120**.

(5) Purveyors proposing interties shall apply to the department of ecology for water right changes as provided in RCW **90.03.383**. Except as provided in RCW **90.03.383(7)** and **90.03.390**, no interties may be constructed without department of ecology action on the proposed change.

(6) The purveyor may be required to have emergency interties approved as nonemergency interties where the interties are used frequently or on a long-term basis. If the department makes a determination, the intertie will require approval in accordance with subsection (3) of this section.

(7) Intertie agreements between purveyors shall include:

- (a) Identification of specific time periods in which water will be provided;
- (b) Identification of the volume of water available for use, including any seasonal or other restrictions; and
- (c) Identification of how water use efficiency programs, data collection, water demand forecasting, and other operational matters will be coordinated.

[Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-132, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **70.119A.180**. WSR 07-02-025B, § 246-290-132, filed 12/22/06, effective 1/22/07. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-132, filed 3/9/99, effective 4/9/99.]

## WAC 246-290-135

### Source water protection.

(1) The department may require monitoring and controls in addition to those specified in this section if the department determines a potential risk exists to the water quality of a source.

(2) SCA.

(a) The purveyor shall maintain an SCA around all sources for the purpose of protecting them from existing and potential sources of contamination.

(b) For wells and springs, the minimum SCA shall have a radius of one hundred feet (thirty meters) and two hundred feet (sixty meters) respectively, unless engineering justification demonstrates that a smaller area can provide an adequate level of source water protection. The justification shall address geological and hydrological data, well construction details, mitigation measures, and other relevant factors necessary to assure adequate sanitary control.

(c) The department may require a larger SCA than specified in (b) of this subsection, or additional mitigation measures if land use, geological, or hydrological data support the decision. It shall be the purveyor's responsibility to obtain the protection needed.

(d) The purveyor shall prohibit the construction, storage, disposal, or application of any source of contamination within the SCA without the permission of the purveyor.

(e) The SCA shall be owned by the purveyor in fee simple, or the purveyor shall have the right to exercise complete sanitary control of the land through other legal provisions.

(f) A purveyor, owning all or part of the SCA in fee simple or having possession and control, shall send to the department copies of legal documentation, such as a duly recorded declaration of covenant, restricting the use of the land. This legal documentation shall state:

(i) Constructing, storing, disposing, or applying any source of contamination is prohibited without the permission of the purveyor; and

(ii) If any change in ownership of the system or SCA is considered, all affected parties shall be informed of these requirements.

(g) Where portions of the control area are in the possession and control of another, the purveyor shall obtain a duly recorded restrictive covenant which shall run with the land, restricting the use of the land in accordance with this chapter and provide the department with copies of the appropriate documentation.

(3) Wellhead protection.

(a) Purveyors of water systems using groundwater or spring sources shall develop and implement a wellhead protection program.

(b) The wellhead protection program shall be part of the water system plan required under WAC 246-290-100 or the small water system management program required under WAC 246-290-105.

(c) The purveyor's wellhead protection program shall contain, at a minimum, the following elements:

(i) A completed susceptibility assessment or equivalent information;

(ii) WHPA delineation for each well, wellfield, or spring with the six month, one, five and ten year time of travel boundaries marked, or boundaries established using alternate criteria approved by the department in those settings where groundwater time of travel is not a

reasonable delineation criteria. WHPA delineations shall be done in accordance with recognized methods such as those described in the following sources:

- (A) Department guidance on wellhead protection; or
- (B) EPA guidance for delineation of wellhead protection areas;
- (iii) An inventory, including identification of site locations and owners/operators, of all known and potential groundwater contamination sources located within the defined WHPA(s) having the potential to contaminate the source water of the well(s) or spring(s). This list shall be updated every two years;
- (iv) Documentation of purveyor's notification to all owners/operators of known or potential sources of groundwater contamination identified under (c)(iii) of this subsection;
- (v) Documentation of purveyor's notification to regulatory agencies and local governments of the boundaries of the WHPA(s) and the findings of the WHPA inventory;
- (vi) A contingency plan to ensure consumers have an adequate supply of potable water in the event that contamination results in the temporary or permanent loss of the principal source of supply (major well(s) or wellfield); and
- (vii) Documentation of coordination with local emergency incident responders (including police, fire and health departments), including notification of WHPA boundaries, results of susceptibility assessment, inventory findings, and contingency plan.

(4) Watershed control program.

(a) Purveyors of water systems using surface water or GWI sources shall develop and implement a watershed control program under Part 6 of chapter **246-290** WAC as applicable.

(b) The watershed control program shall be part of the water system plan required under WAC **246-290-100** or the small water system management program required under WAC **246-290-105**.

(c) The purveyor's watershed control program shall contain, at a minimum, the following elements:

- (i) Watershed description and inventory, including location, hydrology, land ownership and activities that may adversely affect source water quality;
- (ii) An inventory of all potential surface water contamination sources and activities, including identification of site locations and owner/operators, located within the watershed and having the significant potential to contaminate the source water quality;
- (iii) Watershed control measures, including documentation of ownership and relevant written agreements, and monitoring of activities and water quality;
- (iv) System operation, including emergency provisions; and
- (v) Documentation of water quality trends.

(d) Purveyors who have not received previous department approval of a watershed control program shall submit a watershed control program to the department for approval. Following department approval, the purveyor shall implement the watershed control program as approved.

(e) Purveyors of systems using unfiltered surface or GWI sources and meeting the criteria to remain unfiltered as specified in WAC **246-290-690** shall submit an annual report to the department that summarizes the effectiveness of the watershed control program. Refer to WAC **246-290-690** for further information about this report.

(f) Purveyors required to develop a small water system management program under WAC **246-290-105** shall update the watershed control program at least every six years.

(g) Purveyors required to submit a water system plan under WAC **246-290-100** shall update the watershed control program when the water system plan is updated.

(h) The department may require purveyors to update the watershed control program more frequently if the department determines that a potential risk exists to the water quality of a source.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-135, filed 12/14/16, effective 1/14/17; WSR 10-20-068, § 246-290-135, filed 9/29/10, effective 11/1/10. Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-135, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-135, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 94-14-001, § 246-290-135, filed 6/22/94, effective 7/23/94; WSR 93-08-011 (Order 352B), § 246-290-135, filed 3/25/93, effective 4/25/93.]

## **WAC 246-290-140**

### **Existing system as-built approval.**

At the discretion of the department, owners of existing systems without approved construction documents shall provide information necessary to establish the extent of the water system's compliance with this chapter. At a minimum, this shall include submission and approval by the department of:

- (1) A water system plan or small water system management program;
- (2) As-built or record drawings; and
- (3) Water quality analyses.

[Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-140, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 94-14-001, § 246-290-140, filed 6/22/94, effective 7/23/94; WSR 91-02-051 (Order 124B), recodified as § 246-290-140, filed 12/27/90, effective 1/31/91. Statutory Authority: P.L. 99-339. WSR 89-21-020 (Order 336), § 248-54-098, filed 10/10/89, effective 11/10/89.]

**PART 6.****SURFACE WATER TREATMENT****Subpart A - Introduction and General Requirements****WAC 246-290-601****Purpose of surface water treatment.**

(1) Part 6 of chapter **246-290** WAC establishes filtration and disinfection as treatment technique requirements for water systems using surface or GWI sources. The Part 6 treatment technique requirements are established in lieu of maximum contaminant levels (MCLs) for the following contaminants:

- (a) *Giardia lamblia*;
- (b) Viruses;
- (c) Heterotrophic plate count bacteria;
- (d) *Legionella*;
- (e) *Cryptosporidium*; and
- (f) Turbidity.

(2) For water systems using unfiltered surface sources, in whole or part, and that have been required to install, but have yet to complete the installation and operation of, filtration facilities, the turbidity levels at entry points to distribution and sampling/analytical requirements shall be under 40 C.F.R. 141.13 and 40 C.F.R. 141.22, respectively.

[Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-601, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 04-04-056, § 246-290-601, filed 1/30/04, effective 3/1/04. Statutory Authority: RCW **43.20.050** (2) and (3) and **70.119A.080**. WSR 03-08-037, § 246-290-601, filed 3/27/03, effective 4/27/03. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-601, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 93-08-011 (Order 352B), § 246-290-601, filed 3/25/93, effective 4/25/93.]



## WAC 246-290-620

### Applicability of surface water treatment requirements.

(1) The requirements of Part 6 of this chapter apply to water systems that:

(a) Use surface sources or groundwater sources under the direct influence of surface water (GWI); or

(b) Purchase surface or GWI water from an approved public water system or other entity acceptable to the department.

(2) The requirements of Part 6 of this chapter do not apply to water systems that use unfiltered surface or GWI sources as emergency sources, provided the source is physically disconnected from the system at all times until it is needed, and the purveyor meets the following conditions:

(a) Has a department-approved emergency response plan; and

(b) Provides disinfection treatment that meets the requirements under WAC [246-290-662](#)

(2)(d).

(3) The requirements of WAC [246-290-640](#) apply to **Group A** systems that use sources potentially under the influence of surface water as determined by the department.

[Statutory Authority: RCW [43.20.050](#) and [70.119A.080](#). WSR 10-20-068, § 246-290-620, filed 9/29/10, effective 11/1/10. Statutory Authority: RCW [43.02.050](#) [43.20.050]. WSR 99-07-021, § 246-290-620, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW [43.20.050](#). WSR 93-08-011 (Order 352B), § 246-290-620, filed 3/25/93, effective 4/25/93.]

## WAC 246-290-630

### General requirements.

(1) The purveyor shall ensure that treatment is provided for surface and GWI sources consistent with the treatment technique requirements specified in Part 6 of chapter **246-290** WAC.

(2) The purveyor shall install and properly operate water treatment processes to ensure at least:

- (a) 99.9 percent (3-log) removal and/or inactivation of *Giardia lamblia* cysts;
- (b) 99.99 percent (4-log) removal and/or inactivation of viruses; and
- (c) 99 percent (2-log) removal of *Cryptosporidium* oocysts if required to filter.

(3) The purveyor shall ensure that the requirements of subsection (2) of this section are met between a point where the source water is not subject to contamination by untreated surface water and a point at or before the first consumer.

(4) The department may require higher levels of removal and/or inactivation of *Giardia lamblia* cysts, *Cryptosporidium* oocysts, and viruses than specified in subsection (2) of this section if deemed necessary to protect the health of consumers served by the system.

(5) The purveyor shall ensure that personnel operating a system subject to Part 6 of chapter **246-290** WAC meet the requirements under chapter **70.119** RCW and chapter **246-292** WAC.

(6) The purveyor of a **Group A community** system serving water from a surface or GWI source to the public before January 1, 1991, shall comply with applicable minimum treatment requirements. The purveyor shall meet either:

(a) The filtration and disinfection requirements under WAC **246-290-660** and **246-290-662** respectively;

(b) The criteria to remain unfiltered under WAC **246-290-690** and the disinfection requirements under WAC **246-290-692**; or

(c) The criteria to provide a limited alternative to filtration under WAC **246-290-691** and the disinfection requirements under WAC **246-290-692**.

(7) The purveyor of a **Group A noncommunity** system serving water from a surface or GWI source, shall meet either:

(a) The filtration and disinfection requirements under WAC **246-290-660** and **246-290-662**, respectively; or

(b) The criteria to provide a limited alternative to filtration under WAC **246-290-691** and the disinfection requirements under WAC **246-290-692**.

(8) The purveyor of a **Group A** system first serving water from a surface or GWI source to the public after December 31, 1990, shall meet either:

(a) The filtration and disinfection requirements under WAC **246-290-660** and **246-290-662**, respectively; or

(b) The criteria to provide a limited alternative to filtration under WAC **246-290-691** and the disinfection requirements under WAC **246-290-692**.

(9) The purveyor of a system required to install filtration may choose to provide a limited alternative to filtration or abandon the surface or GWI source as a permanent or seasonal source and develop an alternate, department-approved source. Purveyors that develop alternate groundwater sources or purchase water from a department-approved public water

system using a groundwater source shall no longer be subject to Part 6 of chapter **246-290 WAC**, once the alternate source is approved by the department and is on line.

(10) A purveyor that chooses to provide a limited alternative to filtration shall submit an application to the department that contains the information necessary to determine whether the source can meet the criteria.

(11) If a limited alternative to filtration is provided, then the purveyor shall install and properly operate treatment processes to ensure greater removal and/or inactivation efficiencies of *Giardia lamblia* cysts, viruses, or other pathogenic organisms of public health concern (including *Cryptosporidium* oocysts) than would be achieved by the combination of filtration and chlorine disinfection.

(12) Systems that were required to develop a disinfection profile under 40 C.F.R. 141.172 shall provide that profile and a calculated disinfection benchmark, as described in 40 C.F.R. 141.172 (c)(2) and (3), along with other project information specified in WAC **246-290-110**, when proposing any change to the disinfection treatment system. The proposal for change shall include an analysis of how the proposed change will affect the current level of disinfection. The profile must also be available for inspection during routine sanitary surveys conducted under WAC **246-290-416**.

(13) Community and nontransient noncommunity systems serving less than ten thousand persons must meet the disinfection profiling and benchmarking provisions required under 40 C.F.R. 141.530 through 141.544.

(14) Systems required to develop a disinfection profile under 40 C.F.R. 141.530 shall provide that profile and a calculated disinfection benchmark, as described in 40 C.F.R. 141.543 along with other project information specified in WAC **246-290-110**, when proposing any change to the disinfection treatment system. The proposal for change shall include an analysis of how the proposed change will affect the current level of disinfection. The profile must also be available for inspection during routine sanitary surveys conducted under WAC **246-290-416**.

(15) A system using conventional, direct, or in-line filtration that must arrange for the conduct of a CPE, under 40 C.F.R. 141.175 (b)(4) or 40 C.F.R. 141.563, may be required to arrange for CTA. The department will determine the need for CTA on a case-by-case basis.

(16) Water systems subject to the requirements of Part 6 of this chapter must also comply with the enhanced treatment requirements for *Cryptosporidium* under 40 C.F.R. Subpart W. The requirements are in addition to the requirements of Part 6 of this chapter and include:

- (a) General requirements under 40 C.F.R. 141.700;
- (b) Source monitoring requirements under 40 C.F.R. 141.701-707;
- (c) Disinfection profiling and benchmarking requirements under 40 C.F.R. 141.708-709;
- (d) Treatment technique requirements under 40 C.F.R. 141.710-714;
- (e) Requirements for microbial toolbox components under 40 C.F.R. 141.715-720; and
- (f) Reporting and recordkeeping requirements under 40 C.F.R. 141.721-722.

(17) Water systems using UV reactors to obtain treatment credit for *Cryptosporidium* inactivation must:

- (a) Validate the reactors using the validation testing procedures specified under 40 C.F.R. 141.720 (d)(2); or
- (b) Validate the reactor under Austrian ONORM Standards or German DVGW Standards.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-630, filed 12/14/16, effective 1/14/17; WSR 10-20-068, § 246-290-630, filed 9/29/10, effective 11/1/10. Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-630, filed

1/14/08, effective 2/14/08. Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 04-04-056, § 246-290-630, filed 1/30/04, effective 3/1/04. Statutory Authority: RCW **43.20.050** (2) and (3) and **70.119A.080**. WSR 03-08-037, § 246-290-630, filed 3/27/03, effective 4/27/03. Statutory Authority: RCW **43.20.050**. WSR 99-07-021 and 99-10-076, § 246-290-630, filed 3/9/99 and 5/4/99, effective 4/9/99 and 6/4/99; WSR 93-08-011 (Order 352B), § 246-290-630, filed 3/25/93, effective 4/25/93.]

## WAC 246-290-632

### Treatment technique violations.

(1) A treatment technique violation shall be considered a violation of a primary drinking water standard and in the case of an unfiltered system, may result in the purveyor of an unfiltered system being required to install filtration.

(2) A treatment technique violation occurs when a system using a surface or GWI source is identified by the department as the source of a waterborne disease outbreak or any of the following occur as applicable:

(a) The purveyor providing filtration delivers unfiltered water or fails to meet one or more of the following requirements:

- (i) Filtration treatment in accordance with WAC [246-290-660](#); or
- (ii) Disinfection treatment in accordance with WAC [246-290-662](#).

(b) The purveyor required to install filtration:

- (i) Fails to meet the interim disinfection requirements under WAC [246-290-672](#) or as otherwise directed by the department; or
- (ii) Fails to install filtration or develop an alternate source by the applicable time lines specified in WAC [246-290-670](#).

(c) The purveyor of an unfiltered surface water, or GWI source, meeting the criteria to remain unfiltered:

- (i) Delivers water with a turbidity level exceeding 5.0 NTU measured at a point immediately prior to the point of primary disinfection; or
- (ii) Fails to meet one or more of the disinfection requirements under WAC [246-290-692](#) after the dates specified in WAC [246-290-686](#).

(d) The purveyor of an unfiltered source meeting the criteria to provide a limited alternative to filtration:

- (i) Delivers water with a turbidity level exceeding 5.0 NTU measured at a point immediately prior to the point of primary disinfection; or
- (ii) Fails to meet one or more of the disinfection requirements under WAC [246-290-692](#).

(e) A purveyor supplies water from an unfiltered source that has not been previously approved by the department.

(f) A purveyor of a department approved unfiltered source that fails to meet the on-going criteria to remain unfiltered:

- (i) Delivers water with a turbidity level exceeding 5.0 NTU measured at a point immediately prior to the point of primary disinfection; or
- (ii) Fails to meet one or more of the disinfection requirements under WAC [246-290-692](#).

(g) A purveyor of a department approved unfiltered source that has failed to meet the criteria to provide a limited alternative to filtration:

- (i) Delivers water with a turbidity level exceeding 5.0 NTU measured at a point immediately prior to the point of primary disinfection; or
- (ii) Fails to meet one or more of the disinfection requirements under WAC [246-290-692](#).

(h) A purveyor fails to meet the enhanced *Cryptosporidium* treatment requirements under 40 C.F.R. 141.711 or 141.712.

[Statutory Authority: RCW [70.119A.180](#) and [43.20.050](#). WSR 08-03-061, § 246-290-632, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW [43.02.050](#) [43.20.050]. WSR 99-07-021, § 246-290-632, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW [43.20.050](#). WSR 94-

14-001, § 246-290-632, filed 6/22/94, effective 7/23/94; WSR 93-08-011 (Order 352B), § 246-290-632, filed 3/25/93, effective 4/25/93.]

## **WAC 246-290-634**

### **Follow-up to treatment technique violations.**

When a treatment technique violation occurs, the purveyor:

(1) Shall report to the department in accordance with:

(a) WAC **246-290-666** for purveyors providing filtration or required to filter;

(b) WAC **246-290-674** for purveyors installing filtration; or

(c) WAC **246-290-696** for purveyors meeting the criteria to remain unfiltered or providing a limited alternative to filtration;

(2) Shall notify the public in accordance with Part 7, Subpart A of this chapter;

(3) Shall determine the cause of the violation;

(4) Shall take action as directed by the department which may include conducting a CCP. A CCP may include both a CPE and CTA;

(5) Shall identify and systematically address plant-specific factors identified in the CPE during the CTA, if required; and

(6) May be subject to enforcement under WAC **246-290-050**.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 10-20-068, § 246-290-634, filed 9/29/10, effective 11/1/10. Statutory Authority: RCW **43.20.050** (2) and (3) and **70.119A.080**. WSR 03-08-037, § 246-290-634, filed 3/27/03, effective 4/27/03. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-634, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 93-08-011 (Order 352B), § 246-290-634, filed 3/25/93, effective 4/25/93.]

## WAC 246-290-636

### Determination of disinfectant contact time (T).

- (1) The purveyor shall calculate T at peak hourly flow for each surface or GWI source.
- (2) For pipelines, the purveyor shall calculate T by dividing the internal volume of the pipe by the peak hourly flow rate through that pipe.
- (3) For all other system components used for inactivation of *Giardia lamblia* cysts, viruses, and other microorganisms of public health concern, the purveyor shall use tracer studies or empirical methods to determine T.
- (4) The purveyor shall use the T10 value determined by tracer studies or other methods acceptable to the department as T in all CT calculations.
- (5) Tracer studies.
  - (a) The purveyor shall conduct field tracer studies on all system components with configurations (geometry and/or baffling) for which analogous contact times are not documented.
  - (b) Before conducting tracer studies, the purveyor shall obtain the department's approval of a tracer study plan. The plan shall identify at a minimum:
    - (i) How the purveyor will conduct the study;
    - (ii) The tracer material to be used;
    - (iii) Flow rates to be used; and
    - (iv) The names, titles, and qualifications of the persons conducting the study.
  - (c) A professional engineer registered in the state of Washington shall direct the conduct of all tracer studies.
  - (d) Tracer studies shall be conducted in accordance with good engineering practices using methods acceptable to the department such as those described in department guidance on surface water treatment.
  - (e) The department may require the purveyor to conduct additional tracer studies when:
    - (i) Modifications impacting flow distribution or T are made; or
    - (ii) Increases in flow exceed the conditions of the previous tracer studies.
- (6) Empirical methods.
  - (a) Empirical methods may be used to calculate T10, if the purveyor demonstrates to the department's satisfaction that system components have configurations analogous to components on which tracer studies have been conducted and results have been documented.
  - (b) The purveyor shall submit to the department for review and approval engineering justification for determining T10 using empirical methods. As-built drawings of system components in their current configurations shall be submitted with the engineering justification.
  - (c) A professional engineer registered in the state of Washington shall prepare the engineering justification for determining T10 using empirical methods.

[Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-636, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 93-08-011 (Order 352B), § 246-290-636, filed 3/25/93, effective 4/25/93.]



## WAC 246-290-638

### Analytical requirements.

(1) The purveyor shall ensure that only qualified persons conduct measurements for pH, temperature, turbidity, and residual disinfectant concentrations. In this section, qualified means:

(a) A person certified under chapter **246-292** WAC;

(b) An analyst, with experience conducting these measurements, from the state public health laboratory or another laboratory certified by the department;

(c) A state or local health jurisdiction professional experienced in conducting these measurements; or

(d) For the purpose of monitoring distribution system residual disinfectant concentration only, a person designated by and under the direct supervision of a waterworks operator certified under chapter **246-292** WAC.

(2) The purveyor shall ensure that measurements for temperature, turbidity, pH, and residual disinfectant concentration are made in accordance with "standard methods," or other EPA approved methods.

(3) The purveyor shall ensure that samples for coliform and HPC analysis are:

(a) Collected and transported in accordance with department-approved methods; and

(b) Submitted to the state public health laboratory or another laboratory certified by the department to conduct the analyses.

(4) Turbidity monitoring.

(a) The purveyor shall equip the system's water treatment facility laboratory with a:

(i) Bench model turbidimeter; and

(ii) Continuous turbidimeter and recorder if required under WAC **246-290-664** or **246-290-694**.

(b) The purveyor shall ensure that bench model and continuous turbidimeters are:

(i) Designed to meet the criteria in "standard methods," EPA Method 180.1, Hach FilterTrak Method 10133, Hach Method 10258, AMI Turbiwell Method, or Great Lakes Instruments Method 2; and

(ii) Properly operated, calibrated, and maintained at all times in accordance with the manufacturer's recommendations.

(c) The purveyor shall validate continuous turbidity measurements for accuracy as follows:

(i) Calibrate turbidity equipment based upon a primary standard in the expected range of measurements on at least a quarterly basis for instruments using an incandescent light source and on at least an annual basis for instruments using an LED or laser light source; and

(ii) Verify continuous turbidimeter performance on a weekly basis, not on consecutive days, with grab sample measurements made using a properly calibrated bench model turbidimeter.

(d) When continuous turbidity monitoring equipment fails, the purveyor shall measure turbidity on grab samples collected at least every four hours from the combined filter effluent and individual filters while the system serves water to the public and the equipment is being repaired or replaced. The purveyor shall have continuous monitoring equipment online within five working days of failure.

(5) Purveyors shall verify instruments used for continuous monitoring of free and total chlorine residual with a grab sample measurement at least every five days, or with a protocol approved by the department as required under 40 C.F.R. 141.74 (a)(2).

(6) Purveyors monitoring for *Cryptosporidium* or *E. coli* as required under 40 C.F.R. 141.701 shall collect samples and have them analyzed under 40 C.F.R. 141.704 and 141.705.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 17-01-062, § 246-290-638, filed 12/14/16, effective 1/14/17. Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-638, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **43.20.050** (2) and (3) and **70.119A.080**. WSR 03-08-037, § 246-290-638, filed 3/27/03, effective 4/27/03. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-638, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 93-08-011 (Order 352B), § 246-290-638, filed 3/25/93, effective 4/25/93.]

## **WAC 246-290-639**

### **SWTR records.**

- (1) Purveyors using surface or GWI sources shall maintain accurate and complete operations records.
- (2) Operations records shall include, but not be limited to, the following as applicable:
  - (a) Results of all monitoring conducted under Part 6 of chapter **246-290** WAC;
  - (b) Quantity of water produced, plant flow rates, and hours of operation;
  - (c) Types and quantities of chemicals used;
  - (d) Dates and information pertaining to filter and/or disinfection system maintenance;
  - (e) Dates and results of filter and/or disinfection system inspections including records of filtration and backwash rates;
  - (f) Dates and descriptions of major equipment and/or treatment process failures and corrective actions taken; and
  - (g) The information and data specified under 40 C.F.R. 141.721 related to enhanced treatment for *Cryptosporidium*.
- (3) Operations records not reported to the department under WAC **246-290-666** or **246-290-696** shall be maintained at the purveyor's treatment facility.

[Statutory Authority: RCW **70.119A.180** and **43.20.050**. WSR 08-03-061, § 246-290-639, filed 1/14/08, effective 2/14/08. Statutory Authority: RCW **43.20.050**. WSR 93-08-011 (Order 352B), § 246-290-639, filed 3/25/93, effective 4/25/93.]

## WAC 246-290-640

### Determination of GWI sources.

(1) Until the department has made a source GWI determination, the purveyor shall monitor in accordance with the requirements for groundwater sources in WAC 246-290-300 or as directed by the department and provide follow-up in accordance with WAC 246-290-320.

(2) The purveyor, after being notified by the department that one or more of the system sources have been classified as potential GWI, may elect to seek approval from the department to modify the potential GWI source to mitigate surface water influences prior to compliance with subsection (3) of this section, and if so, shall:

(a) Complete a project report, for departmental approval, that describes the proposed source-related modifications, including the schedule for their completion and an explanation of why the source should be reclassified upon completion of the source modifications; and

(b) Demonstrate compliance, if directed by the department, with the requirements of subsection (3) of this section upon completion of the source-related modifications.

(3) The purveyor using a source identified as a potential GWI shall provide to the department all information necessary to determine whether the source is under direct surface water influence. Information shall include, but not be limited to:

(a) Site-specific source water quality data, including temperature, conductivity, or other appropriate parameters as determined by the department;

(b) Documentation of source construction characteristics;

(c) Documentation of hydrogeology;

(d) Distance to surface water; and

(e) Water quality results from nearby surface water(s), including temperature, conductivity, and/or other appropriate parameters as determined by the department.

(4) Upon a determination by the department that one or more potential GWI source(s) being used are in hydraulic connection to a surface water, the purveyor shall:

(a) Secure the services of a professional engineer to direct further evaluation and actions regarding the source;

(b) Provide disinfection treatment of the source in accordance with WAC 246-290-451; and

(c) Provide microscopic particulate analyses (MPA) results for review by the department based upon a sampling plan approved by the department.

(5) A purveyor notified by the department that one or more GWI sources are in use shall:

(a) Within ninety days of notification submit a project report to the department that includes an implementation schedule for compliance with the treatment techniques specified in Part 6 of this chapter;

(b) Notify consumers served by the system; and

(c) Comply with the applicable requirements of WAC 246-290-670.

(6) After completion of the requirements in subsection (3) of this section, the purveyor may modify a GWI source to mitigate direct surface influence. In such cases, the purveyor shall:

(a) Include in a project report, for submittal to the department for approval, a description of the proposed approaches and schedule for source modification; and

(b) Comply again with subsection (3) of this section upon completion of source modifications to be considered for source reclassification.

(7) The department may reevaluate a groundwater source for direct surface influence, if conditions impacting source classification have changed.

[Statutory Authority: RCW **43.20.050** and **70.119A.080**. WSR 10-20-068, § 246-290-640, filed 9/29/10, effective 11/1/10. Statutory Authority: RCW **43.02.050** [43.20.050]. WSR 99-07-021, § 246-290-640, filed 3/9/99, effective 4/9/99. Statutory Authority: RCW **43.20.050**. WSR 93-08-011 (Order 352B), § 246-290-640, filed 3/25/93, effective 4/25/93.]



**Olympic View Water & Sewer District  
Watershed Protection Plan  
Edmonds, Washington**

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**Appendix B  
Wellhead Protection Areas Delineation  
Robinson Noble, Inc.**

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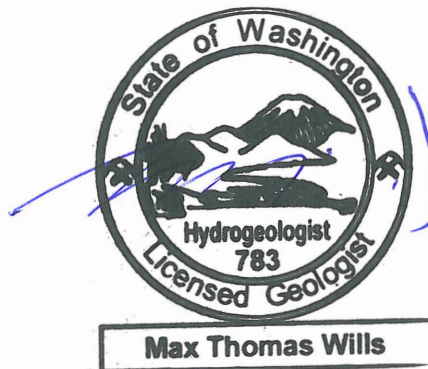
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OLYMPIC VIEW WATER AND SEWER DISTRICT  
WELLHEAD PROTECTION AREA DELINEATION  
DEER CREEK SPRINGS AND 228<sup>TH</sup> STREET WELLFIELD

August 2018

by

Max T. Wills, LHG  
Associate Hydrogeologist







Olympic View Water and Sewer District  
Wellhead Protection Area Delineation  
Deer Creek Springs and 228<sup>th</sup> Street Wellfield  
August 2018

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# Olympic View Water and Sewer District Wellhead Protection Area Delineation Deer Creek Springs and 228<sup>th</sup> Street Wellfield August 2018

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## 1.0 Introduction and Background

The Olympic View Water & Sewer District (District) provides water to an estimated 13,000 customers within an approximately two square mile service area in southwestern Snohomish County (PACE, 2009). The District currently receives about 60% of their supply water through an intertie with the City of Seattle. The remaining 40% is derived from the District's water treatment plant at Deer Creek Springs. The District is also currently in the process of developing an additional groundwater source at their 228<sup>th</sup> Street wellfield. This wellfield will augment the supply from Deer Creek Springs and reduce dependency on the water purchased from Seattle. The District recently completed the construction and testing of two supply wells at the 228<sup>th</sup> Street site and is currently in the process of constructing site infrastructure. Figure 1 presents a map of the District's service area and shows the locations of the Deer Creek Springs and 228<sup>th</sup> Street wellfield source areas.

In anticipation of bringing the new wellfield online, the District is updating their existing Wellhead Protection Program (WHPP) to include the new wellfield source and a more current assessment of the spring source. As part of the WHPP update, Robinson Noble was retained to delineate wellhead protection areas (WHPAs) for the 228<sup>th</sup> Street wellfield and to re-delineate and update the WHPAs for the spring source. This report documents the methods utilized to complete the delineation process and presents the new wellfield WHPAs and the updated WHPAs for the existing spring source.

## 2.0 Wellhead Protection Area Delineation

### 2.1 General

The Washington State Department of Health's (DOH) Wellhead Protection Program Guidance (DOH, 2010) states that all Group A public water systems<sup>1</sup> must prepare a Water System Plan (WAC 246-290-100), which will include a Wellhead Protection Program (WHPP). The WHPP will in turn include Wellhead Protection Areas (WHPAs) delineated for each well, wellfield, or spring source (WAC 246-290-135). DOH requires that each source have three designated WHPAs, labeled Zone 1, Zone 2, and Zone 3, based respectively on the one-year, five-year, and ten-year time-of-travel capture zones<sup>2</sup>. Per DOH guidance (DOH, 2010), Zone 1 (the one-year capture zone) should also include a six-month capture zone to focus greater protection on potential viral and microbial contamination that may pose a higher degree of risk to the drinking water supply.

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<sup>1</sup> A Group A public water system is defined by WAC 246-290 generally as any public water system that serves 15 or more connections on a year-round bases.

<sup>2</sup> The capture zone refers to the zone of groundwater contribution for a given source. Specific time-of-travel capture zones (i.e. one-year capture zone) refer to that portion of the total capture zone in which water will travel to the source within the specified travel time. Travel times to the source, and consequently the size and shape of the time-of-travel capture zone, will vary depending on the hydrogeologic properties associated with that specific zone (i.e. gradient, porosity, pumping rates, etc.).

DOH has also established the use of a buffer zone as required to provide additional source protection up-gradient of the ten-year capture zone. According to DOH guidance (DOH, 2010), buffer zones may incorporate the entire capture zone for a given source or select portions of it and, as appropriate, may also include areas outside of a given capture zone. As described in this report, buffer zones which incorporate the entirety of the defined capture zones for both the 228<sup>th</sup> wellfield and Deer Creek Spring sources are included with the WHPAs for each source.

The WHPAs for both the 228<sup>th</sup> Street wellfield and the Deer Creek Springs sources were delineated using a numerical groundwater model that was specifically developed for this project. Because there is a reasonably sufficient amount of geologic and hydrogeologic data available for the study area, a modeling approach for WHPA delineation was deemed to be more accurate (and more appropriate) than the standard calculated-fixed radius (CFR) method. Model development and calibration are described below in Section 2.2. WHPA delineation is described in Section 2.3.

## 2.2 Numerical Groundwater Model

The development of a numerical groundwater model involves several key steps, starting with the review and compilation of data from existing studies and other sources, which provide information pertaining to the various model inputs. Once the available data have been compiled and evaluated, model construction begins with the development of a conceptual model. The conceptual model, which is typically diagrammatic, provides a generalized overview of the major model components and guides the overall groundwater model construction. Once a basic groundwater model is constructed, it is then finalized by calibrating outputs to known data points (i.e. head values, discharge, etc.). The calibrated model can then be used to perform a number of analytical tasks, which for this project includes the delineation of the wellfield and spring source WHPAs.

### 2.2.1 Previous Studies and Other Model Input Sources

Parameter inputs for the groundwater model developed for this project were obtained from a number of sources, including well construction and testing reports, geologic and hydrogeologic studies, government databases, and geologic maps. The following is a summary of the key data sources utilized for this project.

King County, Department of Natural Resources and Parks, Wastewater Treatment Division, 2003; Brightwater Treatment Plant, Final Environmental Impact Statement, Appendix 6-B (Geology and Groundwater). This study provides key data pertaining to subsurface geologic conditions and aquifer elevations. Groundwater monitoring data and potentiometric maps from this study were also utilized in part for final model calibration.

Liesch, B.A., Price, C.E., and Walters, K.C., 1963; *Geology and Groundwater Resources of Northwest King County, Washington*. Washington State Department of Conservation, Water Supply Bulletin No. 20. This study provides key information for the southern portion of the modeled area, including recharge and model unit descriptions.

Minard, J.P., 1983; *Geologic Map of the Edmonds East and Edmonds West Quadrangles, Washington*; USGS Miscellaneous Field Studies, Map MF-1541. This map was utilized for a variety of model inputs, including the surficial distribution of geologic units, estimated recharge values, and aquifer elevations.

Newcomb, R.C., 1952; *Groundwater Resources of Snohomish County, Washington*; USGS Water Supply Paper 1135. This report provides detailed information about the geologic and

hydrogeologic units within the project area, as well as information pertaining to general flow characteristics of area aquifers.

Robinson Noble, Inc., 2003; Olympic View Water & Sewer District, Modification and Testing of the 228<sup>th</sup> Street Production Well (Shop Well). This report provides key model input data for the area around the 228<sup>th</sup> Street wellfield. This includes hydraulic conductivity values and aquifer elevation data. Groundwater elevation data for this site was also utilized in part for final model calibration.

Robinson Noble, Inc., 2015; Olympic View Water & Sewer District, 8605 228<sup>th</sup> Street Test Well. This report provides additional information pertaining to model feature elevations in the area of the 228<sup>th</sup> Street wellfield, hydraulic conductivity values, and other hydrogeologic parameters. Survey data from this study also provided key information pertaining to the gradient and flow directions of groundwater in the area of the 228<sup>th</sup> Street wellfield. Water level data from this study was also used for model calibration.

Robinson Noble, Inc., 2018; Olympic View Water & Sewer District, Construction and Testing of Production Well 2. This report provides key model input data for the area around the 228<sup>th</sup> Street wellfield. This includes hydraulic conductivity values, production rates, and aquifer elevation data. Water level and drawdown data from this study were also used in part for final model calibration.

Shannon and Wilson, Inc., 2016; Hydrogeologic Report New Madrona K-8 Project, 9300 236<sup>th</sup> Street SW, Edmonds, Washington. This report provides specific model input data, including hydraulic conductivity values, water level data, and flow directions, in the up-gradient areas east of Deer Creek Springs. Monitoring data from this study was also used in part for final model calibration.

Thomas, B.E., Wilkenson, J.M., and Embrey, S.S., 1997; *The Groundwater System and Groundwater Quality in Western Snohomish County, Washington*; USGS Water Resources Investigations Report 96-4312. This report provides detailed information regarding the characteristics of the hydrogeologic units within the project area. It also provides key information regarding aquifer elevations, recharge values, and flow data that was utilized in part for final model calibration.

In addition to the reports and studies listed above, this project utilized a number of other miscellaneous sources to support model development. Between 2004 and 2010, in conjunction with the Brightwater sewer tunnel construction, Robinson Noble conducted extensive groundwater monitoring at the both the Deer Creek Springs site and the original shop well (located near the current 228<sup>th</sup> Street wellfield). Hydrographs created during this monitoring were used for final model calibration, and precipitation data collected during the monitoring effort were used to evaluate the modeled recharge values. We also accessed the Washington State Department of Ecology's (Ecology) online well log data base. We estimate that this database contains approximately 1,200 well reports (well logs) for the study area. These logs were first screened for reliability, and then reliable logs were utilized for a variety of model input information (i.e. aquifer elevation, water levels for calibration, etc.).

### ***2.2.2 Conceptual Model***

A hydrogeologic conceptual model is a representation of a groundwater flow system that simplifies and organizes various geologic and hydrologic information so that the flow system can be more readily analyzed (Anderson and Woessner, 1992). The conceptual model synthesizes available data (maps, cross-sections, hydrographs, well logs, etc.) into a generalized representa-

tion of the geology as it affects the groundwater flow system in a given area. Ideally, a conceptual model should be as simple as possible but still contain all of the applicable components necessary to recreate flow system behavior. Once it is developed, the conceptual model serves as a guide for the construction of the final groundwater model.

Figure 2 presents the conceptual model that was developed for this project as a schematic cross section. The conceptual model for this project contains three major components: hydrostratigraphic units, model boundaries, and general flow system inflow and outflow information. These components are described in detail below.

### 2.2.2.1 Hydrostratigraphic Units

A key step in developing the conceptual model is to define the various hydrostratigraphic units that will affect the flow system being modeled. Hydrostratigraphic units are groupings of sediments that exhibit similar hydrogeologic properties. They are typically divided into two general groups which include aquifers and confining units and may or may not correspond with the area geologic units.

Within the project area, the hydrostratigraphic units modeled do generally correspond with the area geologic units. Figure 3 shows the surficial geology within the study area (Minard, 1983). Table 1 summarizes the hydrostratigraphic units applicable to this project, which are listed from top to bottom in stratigraphic order (youngest to oldest or in general order of deposition).

Table 1: Hydrostratigraphic Units

Hydrostratigraphic Unit	Hydrogeologic Classification	Unit Description
Younger Alluvium (Qyal)	Aquifer (when in direct contact with Qva)	Fluvial sands and gravels with lesser organic material. Thin and limited lateral extent. For modeling purposes, this unit is grouped with the Qva aquifer when it is in direct contact with Qva materials.
Vashon Recessional Outwash (Qvr)	Aquifer (when in direct contact with Qva)	Sands and gravels with lesser clay and silt. For modeling purposes, this unit is grouped with the Qva aquifer when it is in direct contact with Qva materials.
Vashon Till (Qvt)	Confining Unit	Dense, unsorted clay-through gravel- and cobble-size material. This is the most extensive surficial deposit in the study area. It has a low permeability, is upwards of 100 feet thick, and forms a protective cap over the Qva aquifer.
Vashon Advance Outwash (Qva)	Aquifer	Sands with lesser gravel. Laterally extensive across the study area with thicknesses ranging from 100 to 150 feet. This unit is partially saturated and considered an unconfined aquifer system.
Transitional Beds (Qtb)	Confining Unit	Low permeability sequence of layered clay-through fine sand-size material. This unit is relatively thick across the model area and forms the base of the model.

Both the Deer Creek Springs and the 228<sup>th</sup> Street wellfield derive groundwater from the Vashon advance outwash (Qva), which is referred to in this study as the Qva aquifer. As shown on Figure 3, the Qva aquifer is exposed at the surface in several parts of the study area, but is largely overlain by Quaternary Vashon till (Qvt). As shown in Figure 2, the Qvt forms the upper surface of the model where it is present. In areas where the Qvt is absent, the Qva forms the upper surface of the model. The Qva aquifer is underlain across the study area by pre-Vashon transitional beds (Qtb). This unit constitutes the lower surface of the model (see Figure 2). A detailed description of the hydrostratigraphic units utilized for this project is presented below.

### ***Younger Alluvium (Qyal)***

As shown in Figure 3, the Qyal hydrostratigraphic unit has limited aerial extent within the study area, and is generally constrained to narrow zones along stream corridors. As described by various authors (see Section 2.2.1), the Qyal consists of fluvial sand and gravel deposits with some organic materials. The Qyal is relatively thin and typically underlain by adjacent map units. Because the Qyal is relatively porous, when it is in direct contact with the Qva aquifer, it responds hydraulically as an extension of the aquifer. In these situations, the Qyal is considered part of the Qva aquifer. In situations where the Qyal is geologically isolated from the Qva, there isn't hydraulic continuity with the Qva aquifer, so it is grouped with the Qvt hydrostratigraphic unit.

### ***Vashon Recessional Outwash (Qvr)***

Similar to the Qyal, the Qvr has limited aerial extent within the study area and is relatively thin. The Qvr is comprised of stratified sands and gravels with lesser silt- and clay-size material, which were deposited by the receding Vashon continental glacier. Similar to the Qyal, the Qvr is relatively porous, so when it is in direct contact with the Qva aquifer, it responds hydraulically as an extension of the aquifer. As such, the Qvr is considered part of the Qva aquifer in these situations. Where the Qvr is geologically isolated from the Qva it is grouped with the Qvt hydrostratigraphic unit.

### ***Vashon Till (Qvt)***

The Qvt consists of a dense, unsorted mixture of clay- through gravel- and cobble-size sediments that were deposited in situ by the Vashon continental glacier. The Qvt is the predominant surficial deposit within the study area, and typically extends to depths of over 100 feet. The Qvt has a low permeability, and where present, it impedes infiltration of precipitation. This provides a protective cap for the underlying Qva aquifer. The Qvt often contains isolated pockets of more permeable material, which may contain perched groundwater<sup>3</sup>. However, these perched zones are usually very limited in extent, and the Qvt hydrostratigraphic unit, for the purpose of modeling, is considered to be unsaturated.

### ***Vashon Advance Outwash (Qva)***

The Qva is comprised of stratified sands with lesser gravel- and silt-size materials, which were laid down by meltwater issuing from the advancing Vashon continental glacier. The Qva is laterally extensive within the study area, but there are a few isolated areas, primarily along the study area boundaries, where the Qva is not present. The thickness of the Qva within the study area generally ranges from between 100 to 130 feet. The Qva materials are not fully saturated within the study area, and the Qva aquifer is considered an unconfined aquifer system. As

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<sup>3</sup> Perched groundwater is groundwater that accumulates in isolated pockets of permeable material at elevations above that of the local water table (hence the term "perched").



mentioned previously, the Qva aquifer is the groundwater source for Deer Creek Springs and the 228<sup>th</sup> Street wellfield.

### *Pre-Vashon Transitional Beds (Qtb)*

The Qtb is a layered sequence of very low permeability materials that were laid down in lakes and non-glacial fluvial systems prior to the deposition of the Qva sands. The Qtb consists of beds and laminae of clay-, silt-, and very fine sand-size material, with occasional zones of peat and organic material. The Qtb is consistently present across the study area and has an estimated thickness of approximately 130 feet within the model area. As mentioned previously, the Qtb forms the base of the model for this project (see Figure 2).

#### **2.2.2.2 Boundary Identification**

Generally there are two types of hydrologic boundaries: physical boundaries and hydraulic boundaries. Physical boundaries are formed by the presence of a physical impediment to groundwater flow such as an impermeable geologic unit or the truncation/absence of an aquifer. Hydraulic boundaries are groundwater conditions that impede groundwater movement, such as a large lake or a groundwater divide. Ideally, model boundaries can be placed along naturally occurring boundaries such as groundwater divides or surface water bodies. However, this is not always feasible.

Figure 4 presents the aquifer boundaries and how they were represented in the model. The western edge of the modeled area corresponds to the exposure of the Qva aquifer in the cliffs along Puget Sound and where the Qva drops to sea level and is bounded by Puget Sound (in the extreme southwest corner of the model area). In the real world, this is a discharge boundary for the Qva aquifer. Water in the aquifer discharges through springs, as evapotranspiration to vegetation on the bluffs, and (where the boundary is below sea level) as underflow into Puget Sound. In the model, we've represented the western boundary with drains<sup>4</sup>, set with relatively low conductance values along areas where minor seepage occurs and with relatively high conductance values at points where streams emanate from the exposed Qva aquifer. The most prominent of these is Deer Creek (which emanates from Deer Creek Springs), but also includes (to the north of Deer Creek) Shell Creek, Shelleberger Creek, and an unnamed creek.

A similar aquifer boundary occurs in the southeast corner of the model area where Lyon Creek has eroded down to and through the base of the Qva. Here water discharges from the aquifer as springs, seepage, and evapotranspiration above the creek. Again, this natural discharge boundary is represented in the model with drains.

Within the modelled area, there are a number of creeks and lakes which are bedded in the Qva, or are in other ways in hydraulic continuity with the Qva (bedded in Qyal or Qvr materials that are in direct contact with the Qva). These include the before mentioned streams on the northwest and southeast sides of the model as well as Hall Creek, McAleer Creek, Hall Lake, and Lake Ballinger in the interior of the model. Where streams and lakes are in direct continuity with the aquifer, groundwater discharge or recharge naturally occurs depending on the head relationship

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<sup>4</sup> A drain is a model condition that allows water to flow out of the model if the groundwater level in the model cell containing the drain exceeds the drain's assigned elevation. The amount of flow out of the drain is controlled by a conductance value assigned to the drain as well as the groundwater elevation. Drains are often used to model springs and groundwater seepage. Drains only allow water to exit (discharge) from a model and not to enter (recharge).

of the surface water and the groundwater. These surface water bodies are represented in the model as general head boundaries<sup>5</sup>.

The natural real-world northern, southern, and eastern boundaries of the Qva aquifer system are not present within the study area. In order to keep the size of the model reasonable, these distant boundaries are represented in the model as groundwater streamlines. Streamlines represent a direction of groundwater flow (flow line) within an aquifer. Within the project area, flow in the aquifer in the northern and southern portions of the modeled area is generally east-west. Because these areas are distant from the portion of the model that will be affected by modeled production from the 228<sup>th</sup> Street wellfield, it is very unlikely that there is any significant contribution of flow into the aquifer from either the north or south sides of these streamlines. Therefore, in the model, they are represented by no-flow boundaries placed parallel to the general flow direction.

Such no-flow boundaries are conceptually valid for the model as long as no modeled stresses are placed near the boundaries that would alter the direction of the natural flow lines that are essentially parallel to the boundaries. Consequently, the northern, southern and eastern model boundaries, were also purposely located a significant distance away from the main areas of interest, namely the Deer Creek Springs and 228<sup>th</sup> Street wellfield source areas. This was done specifically to minimize any significant boundary effect in these areas of the model. In the model, flow is generally parallel to these boundaries except for near the lower reaches of Hall Creek. However, this area is distant enough from the area of interest that it does not likely impact the model results.

### 2.2.2.3 General Flow System

The final step in developing a conceptual model is to define the general flow system. This essentially amounts to diagramming the basic pathways by which water enters, passes through, and exits the model. Figure 2 presents the conceptual model that was developed for this project, which diagrams the various flow pathways in cross-section view.

As shown on Figure 2, water enters the system primarily as precipitation. When precipitation falls on the land surface, only a portion of it actually infiltrates into the ground. The portion that is not infiltrated may flow overland as runoff or evaporate back to the atmosphere. Runoff may be infiltrated further down-slope or flow overland out of the model area. A portion of the water that infiltrates into the ground may be taken up through the roots of plants and trees and transpire back to the atmosphere through their leaves. Typically, the combined effects of evaporation and plant transpiration are considered together as evapotranspiration. That portion of water that infiltrates into the ground and is able to replenish the aquifer system is referred to as recharge. Recharge is always a percentage of the total precipitation value and varies from place to place depending on specific conditions (i.e. plant cover, temperature, soil permeability, etc.).

For this study, recharge is largely a function of the surficial geology. For the surface areas mapped with Qvt (see Figure 3), because the Qvt has relatively low permeability, recharge rates are fairly low and much of the precipitation that falls on these areas flows overland as runoff. Conversely, because the Qva is fairly permeable, in areas where the Qva is exposed at

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<sup>5</sup> General-head boundaries are model conditions that allow water to flow out of the model (discharge) if the groundwater level in the model cell containing the general-head boundary exceeds the assigned boundary elevation or into the model (recharge) if the groundwater level is lower than the assigned boundary elevation. The amount of flow into or out of the boundary is controlled by a conductance value assigned to the drain as well as the groundwater elevation.

land surface, infiltration (and recharge) is significantly higher. Furthermore, much of the precipitation that runs off in the Qvt covered areas is readily infiltrated when it reaches areas of exposed Qva. Additional recharge occurs where streams (or lakes) have losing reaches (when streams lose water through infiltration into the ground).

As shown on Figure 2, groundwater that reaches the Qva aquifer flows primarily horizontally down-gradient through the aquifer. This occurs because the underlying Qtb has a very low permeability compared to the Qva, which impedes downward migration of water. As with most confining units, there is some vertical leakage from the Qva aquifer downward through the Qtb. However, it is minor and is not considered a significant out-flow for this modeling project.

Aside from minor leakage to the underlying Qtb, groundwater exits the Qva aquifer through one of several routes. As shown on Figure 2, groundwater may be extracted from the system through production withdrawal from a well (i.e. the 228<sup>th</sup> Street wellfield). It may also flow out of the system through one of the major springs (i.e. Deer Creek Springs), it may exit the system as minor seepage through the Qva exposures in the cliffs along the west side and southeast corner of the model, it can become stream (or lake) flow in gaining reaches, or it can be discharged into Puget Sound (which is not shown on Figure 2 and only occurs in the extreme southwestern corner of the model area).

### **2.2.3 Numerical Model Construction**

The numerical groundwater model developed for this project was constructed using the Department of Defense Groundwater Modeling System (GMS). GMS is a comprehensive graphical user program that serves as a pre- and post-processing interface for a variety of groundwater modelling and analytical programs. For this project, GMS was used to interface with MODFLOW, which is an open-source and widely utilized finite-difference groundwater model<sup>6</sup> developed and distributed by the USGS (Harbaugh, 2005). The model developed for this project was constructed as a steady-state groundwater model<sup>7</sup>.

#### **2.2.3.1 Numerical Model Inputs**

Once a conceptual model is developed, the initial step for constructing the numerical model is to create a finite difference grid to cover the horizontal (aerial) and vertical space to be modeled. The horizontal model area for this project is shown on Figure 4, which covers the area within the model boundaries previously described in Section 2.2.2.2. Figure 4 also shows the finite difference grid (grid) used for the final model. As shown on Figure 4, horizontal dimensions of the individual grid cells are refined around the two primary source areas (Deer Creek Springs and the 228<sup>th</sup> Street wellfield) to provide more detail in the near-field areas around these two sources. The horizontal dimension of the cells adjacent to the two sources is 50 feet square. The cell size was increased at increments of 10% away from the source areas to a maximum cell size of 250 feet square. The horizontal elements of the model are geographically referenced to NAD83/UTM Zone 10<sup>8</sup>.

For the vertical space, the model utilizes a single layer of grid cells (a one-layer model) to represent the Qva aquifer flow system. Because the Qvt is unsaturated, it is not necessary to set up a separate layer to represent the till because there is no flow within the Qvt to simulate. As

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<sup>6</sup> The finite difference approach utilizes a grid system to represent individual flow cells, which are hydraulically (mathematically) connected to surrounding cells and manipulated together to simulate a flow system.

<sup>7</sup> In a steady-state groundwater model, the magnitude and direction of flow is constant with time, versus a transient model where the magnitude and direction of flow varies with time. For a steady-state model, the volume of water within the model domain is constant (flow into the model is equal to the flow out of the model).

<sup>8</sup> The North American Datum of 1983 (NAD83)/Universal Transverse Mercator (UTM) Zone 10; EPSG:26910.

discussed previously in Section 2.2.2.3, leakage through the underlying Qtb is negligible, and the top surface of the Qtb was used to represent the base of the model. Cell elevations for the top of the model were incorporated into the model by importing LIDAR<sup>9</sup> data available for the study area. Cell elevations for the base of model were derived by importing and interpolating data from a combination of sources, including published USGS maps of the top surface of the Qtb (Thomas, et al, 1997), the elevations of the exposed contact between the Qtb and the Qva (Minard, 1983), and several cross sections that traverse the study area generated by King County during the construction of the Brightwater sewer tunnel (King County, 2003).

Once the model grid was established, additional model inputs were incorporated into the model. The elevations of the drains and general-head boundaries shown on Figure 4 were set respectively to the mapped elevations along the Qtb/Qva contact and the mapped elevations of the streams and lakes bedded in the Qva (see Section 2.2.2.2). There are no established conductance values for the drains and general-head boundaries for the study area. As such, somewhat arbitrary conductance values were initially set for these features, and these values were adjusted during the calibration process. Initial conductance values for the drains corresponding to major springs (i.e. Deer Creek Springs) were set relatively high as compared to the other drain features without obvious discharge points. Similar proportions were maintained during the calibration process.

As discussed in Section 2.2.2.3, recharge is largely a function of surficial geology, with highest recharge occurring in areas where the Qva is exposed at the surface, and lesser recharge occurring in areas covered by the Qvt. Aerial recharge values were applied to the model using this assumption by creating aerial coverage-polygons<sup>10</sup> corresponding to the areas mapped as Qvt and Qva (Minard, 1983). During monitoring efforts conducted by Robinson Noble between 2004 and 2010 (see Section 2.2.1), it was established that the average annual precipitation for the study area is approximately 37 inches/year. This is in agreement with other area studies (see Section 2.2.1). Regression analyses conducted by the USGS (Woodward, et al, 1995) and other information provided specifically for Snohomish County (Thomas, et al, 1997) indicate recharge values of 13 and 26 inches/year, respectively for areas mapped as Qvt and Qva. These values were applied accordingly to the current model for the areas mapped as Qvt and Qva.

Similar to the recharge, different values of hydraulic conductivity (K) were applied to the model (again using a series of polygons created in GMS). Pumping test data for the wells constructed at the 228<sup>th</sup> Street wellfield (Robinson Noble, 2003, 2015, and 2018) indicate K values of 50 feet/day for the near-field area around the wellfield. Testing of injection wells at the recently constructed Madrona Elementary School (Shannon & Wilson, 2016), which is located just south of the 228<sup>th</sup> Street wellfield, indicate similar K values of 55 feet/day. These K values were applied to these two areas of the model accordingly.

Elsewhere, the K values are less known. However, the USGS (Thomas, et al, 1997) indicates that K values for the Qva in the southwest corner of Snohomish County ranges from 3 to 310 feet/day with a median value of 42 feet/day. This is comparable to the K values established for the 228<sup>th</sup> Street wellfield and the Madrona School site. Median K values were initially applied to all of the areas of the model, save for the areas around the 228<sup>th</sup> Street wellfield and the Madrona School site, and then adjusted accordingly during the calibration process (see Section 2.2.3.2). For the final calibrated model, in 24 separate polygons used to designate K values

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<sup>9</sup> Light imaging, detection, and ranging (LIDAR) is a surveying method that uses lasers to produce high-resolution digital maps, including topographic maps.

<sup>10</sup> GMS utilizes polygons that are created by the user to apply aerial or map-view features such a recharge and hydraulic conductivity to groups of cells within the model area.

across the model area, K values ranged from 10 to 60 feet/day with a median value of 50 feet/day. This is comparable to the K values determined by the USGS for the Qva aquifer in this portion of Snohomish County.

### 2.2.3.2 Model Calibration

Following initial model construction, the overall flow pattern simulated using the initial model inputs was compared to known flow patterns (potentiometric surface maps) developed for the area by previous workers. These include potentiometric maps created by the USGS (Newcomb, 1952; and Thomas, et al, 1997) and by King County during the construction of the Brightwater sewer tunnel (King County, 2003). The initial flow pattern simulated by the model was noted to approximate the general flow patterns and heads (water level elevations) of these other potentiometric maps.

At this point, select model parameters were systematically modified to adjust simulated heads to approximate observed heads in a series of model observation wells<sup>11</sup>. Select model parameters were also modified to adjust the modelled discharge rate for Deer Creek Springs to approximate actual rates recorded by the District. For this project, the model parameters available for calibration were limited to drain and general-head conductance values, and the K within the specified range of values determined by 1997 USGS study (Thomas, et al, 1997). Recharge, the known areas of K, and various elevation information are considered fixed values and were not modified during the calibration process.

The final groundwater model was considered calibrated when the simulated heads and discharge rate from Deer Creek Springs were in general agreement with observed conditions. Figure 5 presents a plot of the calibration results for the observation wells. It should be noted that the three outliers indicated in red on Figure 5 are for observation wells located along the northern and southern margins of the model, areas where the model might be expected to be less calibrated due to the boundary conditions. The calibration residuals<sup>12</sup> for the remaining observation wells (disregarding the noted outliers) range from -13.1 to 8.7 feet, with a mean residual value of 1.5 feet and a root mean squared (RMS) error of the residuals of 5.1 (see Table 2). The calibrated residual value for the flow of Deer Creek Springs is 60 gpm. These are all considered acceptable calibration values. Figure 6 presents a potentiometric map of the Qva aquifer showing simulated heads that were generated from the final calibrated model.

Table 2: Model Calibration Statistics

Number of Water Level Observations	23	Mean Error of Water Level Residuals	1.5
Mean Absolute Error of Water Level Residuals	3.2	Root Mean Squared Error of Water Level Residuals	5.1
Deer Creek Springs Observed Flow	840 gpm	Deer Creek Springs Modeled Flow	780 gpm

## 2.3 Wellfield and Spring Source WHPA Delineation

Using the calibrated groundwater model, WHPAs were delineated for the 228<sup>th</sup> Street wellfield and Deer Creek Springs sources using the MODPATH module of GMS. MODPATH is a particle-

<sup>11</sup> Observation wells are calibration points that are incorporated into the model at the corresponding locations of real-world wells with recorded water levels.

<sup>12</sup> The difference between observed and computed head.

tracking post-processing program<sup>13</sup> designed to work directly within MODFLOW (Pollock, 2017). Within the MODPATH interface, a porosity value of 20% was set for the Qva aquifer. This value, which is near the lower end of typical porosity values for sand aquifers like the Qva (Heath, 2004), was used to generate conservative WHPAs.

The WHPAs for the 228<sup>th</sup> Street wellfield were delineated using a simulated withdrawal rate of 500 gallons per minute (gpm), which is the full instantaneous quantity ( $Q_i$ ) allocated by District's current water right<sup>14</sup>. The current allocated annual quantity ( $Q_a$ ) for the water right is 560 acre-feet/year, so the wellfield can feasibly only be pumped at a maximum continuous rate of 347 gpm without exceeding the allocated  $Q_a$ . However, there are only minimal deference's between the WHPAs delineated using a rate of 347 gpm and those delineated using a rate of 500 gpm. Delineation at the higher rate results in slightly larger, more conservative WHPAs for the wellfield, which is intended to cover all conceivable pumping conditions.

Using MODPATH, particles were introduced at the 228<sup>th</sup> Street wellfield and Deer Creek Springs, and then tracked up-gradient for specified time intervals. Particle tracking at both sources was conducted for six-month, one-year, five-year, and ten-year intervals. Additional particle tracking was also conducted using the "to beginning" option in MODPATH to track the particles to their ultimate origin within the model. This allowed delineation of the entire zone of contribution for the two sources. MODPATH was then used to convert the particle tracks to specific time-of-travel capture zones (see Section 2.1) for the two sources. Figure 7 presents the time-of-travel capture zones (WHPAs) that were delineated for the two sources. In addition to the standard six-month, one-year, five-year, and ten-year WHPAs, the capture zones that were calculated for the entire zone of contribution for each of the two sources were used to define the recommended buffer zones.

### 3.0 Summary

DOH requires the definition of wellhead protection zones based on travel rates of groundwater (DOH, 2010). DOH defines five zones for which wellhead protection strategies should be considered. These include the following:

- *The sanitary control area*: Typically the 100-foot radius of control around a wellhead or a spring (WAC 246-290-135).
- *Zone 1*: The one-year time-of-travel capture zone. Zone 1 also includes an additional six-month time-of-travel capture zone to focus greater protection on potential viral and microbial contamination.
- *Zone 2*: The five-year time-of-travel capture zone.
- *Zone 3*: The ten-year time-of-travel capture zone.
- *The buffer zone*: This zone may extend up-gradient of Zone 3 to include the entire zone of contribution for a given source.

The first four of these zones are required components of a WHPP and define areas requiring differing levels of response to a contamination event based on the expected time of travel to a given groundwater source. The buffer zone is considered optional, but is often vital in planning

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<sup>13</sup> MODPATH mathematically tracks particles from a given source, up-gradient along the flow lines in a MODFLOW model for a user specified time-frame.

<sup>14</sup> Water right G1-26021 allocates an instantaneous withdrawal ( $Q_i$ ) of 500 gpm and an annual withdrawal ( $Q_a$ ) of 560 acre-feet/year for the District's 228<sup>th</sup> Street wellfield.

for comprehensive protection of the supply sources (DOH, 2010). These specific WHPAs, including buffer zones, have been delineated for the 228<sup>th</sup> Street wellfield and the Deer Creek Springs sources and are presented in Figure 7.

## 4.0 Recommendations

The recommended WHPAs, which correspond to the one-year, five-year, and ten-year time-of-travel zones (Zones 1, 2, and 3, respectively), for both the Deer Creek Springs and the 228<sup>th</sup> Street wellfield are shown on Figure 7. However, the Qva aquifer is a relatively shallow system which is directly exposed at the surface in many places within the study area and extra protection is recommended. As such, we also recommend the incorporation of a buffer zone as part of the WHPAs for both sources. The recommended buffer zones, which incorporate the entire zone of contribution up-gradient of Zone 3 for both sources, are shown on Figure 7.

Within the recommended WHPAs presented on Figure 7, there is cause for additional concern in the areas where the Qva is mapped as the surficial geologic unit. Figure 8 presents a composite map that identifies these specific areas. The Qva aquifer has no natural geologic protection in these locations and is highly vulnerable to impact from various activities that may occur within these areas. As such, additional precautions are warranted for these specific areas.

Additionally, the buffer zone (zone of contribution) for the 228<sup>th</sup> Street wellfield reaches Hall Creek (see Figure 8). This indicates that water from Hall Creek directly recharges a portion of the aquifer that supplies water to the wellfield. Based on the current modeling, water from the creek will reach the wellfield within an estimated period of about 18 years. It is recommended that the District interface with any agencies or entities monitoring water quality along this portion of the creek and request that the Department of Ecology and Snohomish County Environmental Health inform the District of any catastrophic pollution events that may occur in this reach of Hall Creek.

## 5.0 References

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- Robinson Noble, Inc., 2018; *Olympic View Water & Sewer District, construction and testing of Production Well 2*
- Shannon and Wilson, Inc., 2016; *Hydrogeologic report new Madrona K-8 project, 9300 236<sup>th</sup> Street SW, Edmonds, Washington*
- Thomas, B.E., Wilkenson, J.M., and Embrey, S.S., 1997; *The groundwater system and groundwater quality in western Snohomish County, Washington*; USGS Water Resources Investigations Report 96-4312. 9 plates
- Washington State Department of Health, 2010; *Washington State wellhead protection program guidance document*; Washington State Department of Health, Environmental Health Programs, DOH 331-018 (revised)
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*The statements, conclusions, and recommendations provided in this report are to be exclusively used within the context of this document. They are based upon generally accepted hydrogeologic practices and are the result of analysis by Robinson Noble, Inc. staff. This report, and any attachments to it, is for the exclusive use of Olympic View Water & Sewer District. Unless specifically stated in the document, no warranty, expressed or implied, is made.*

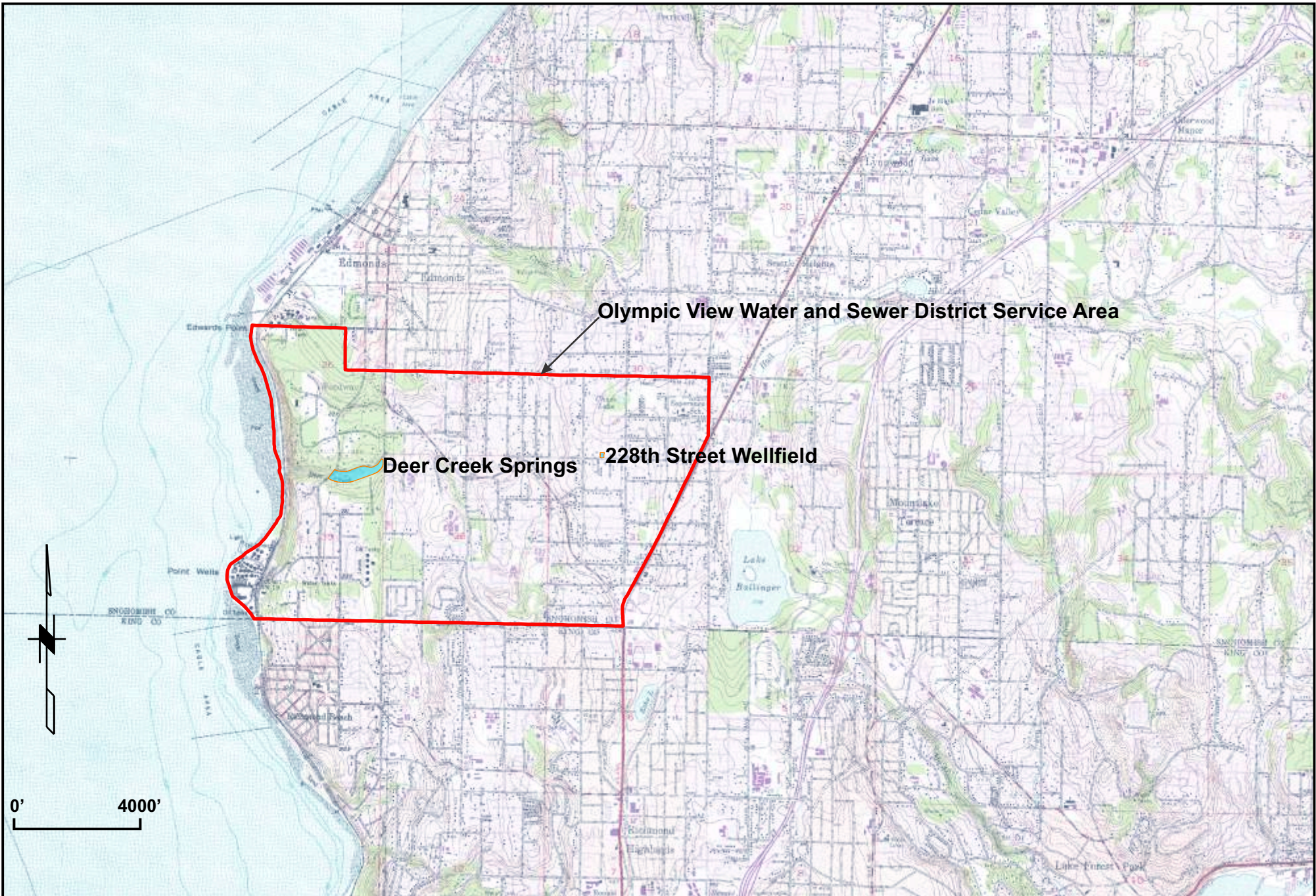




## Figures

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Olympic View Water and Sewer District Service Area

Deer Creek Springs 228th Street Wellfield



Note: Basemap from  
USGS Edmonds  
West and East  
Quadrangles

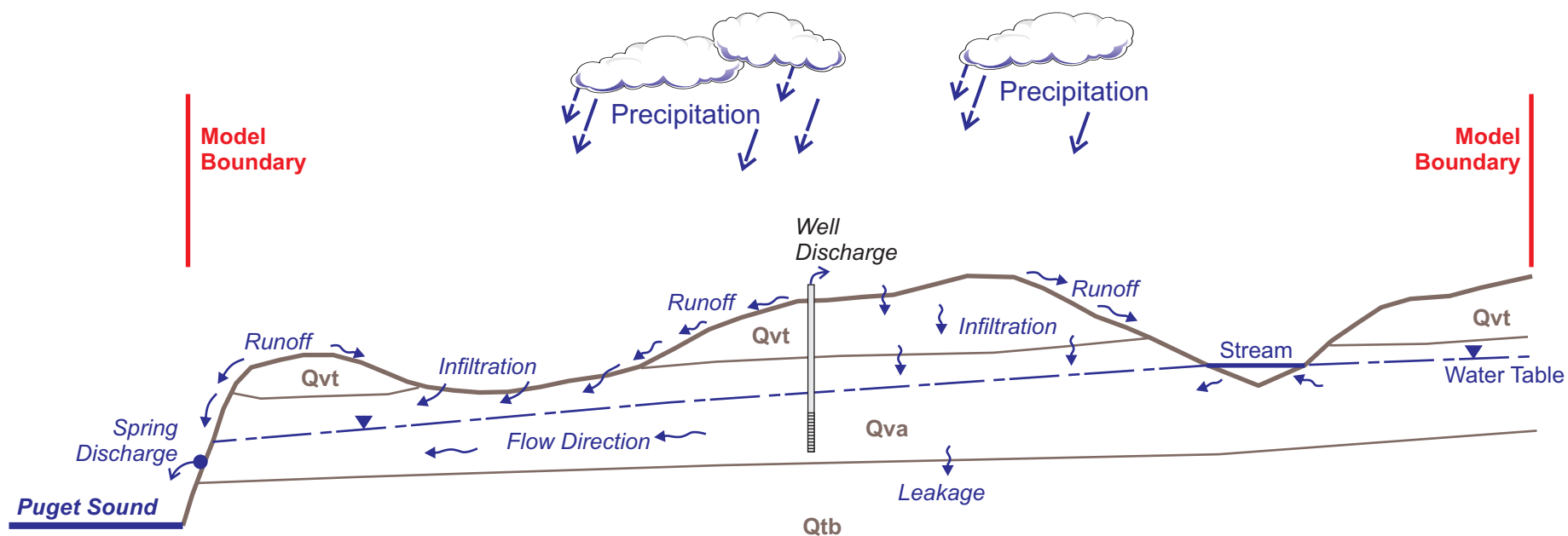
PM: MTW  
August 2018  
1686-007A

Snohomish County  
T 27 N/R 3,4 E  
Scale 1" = 4000'

Figure 1


Vicinity Map with Service Area





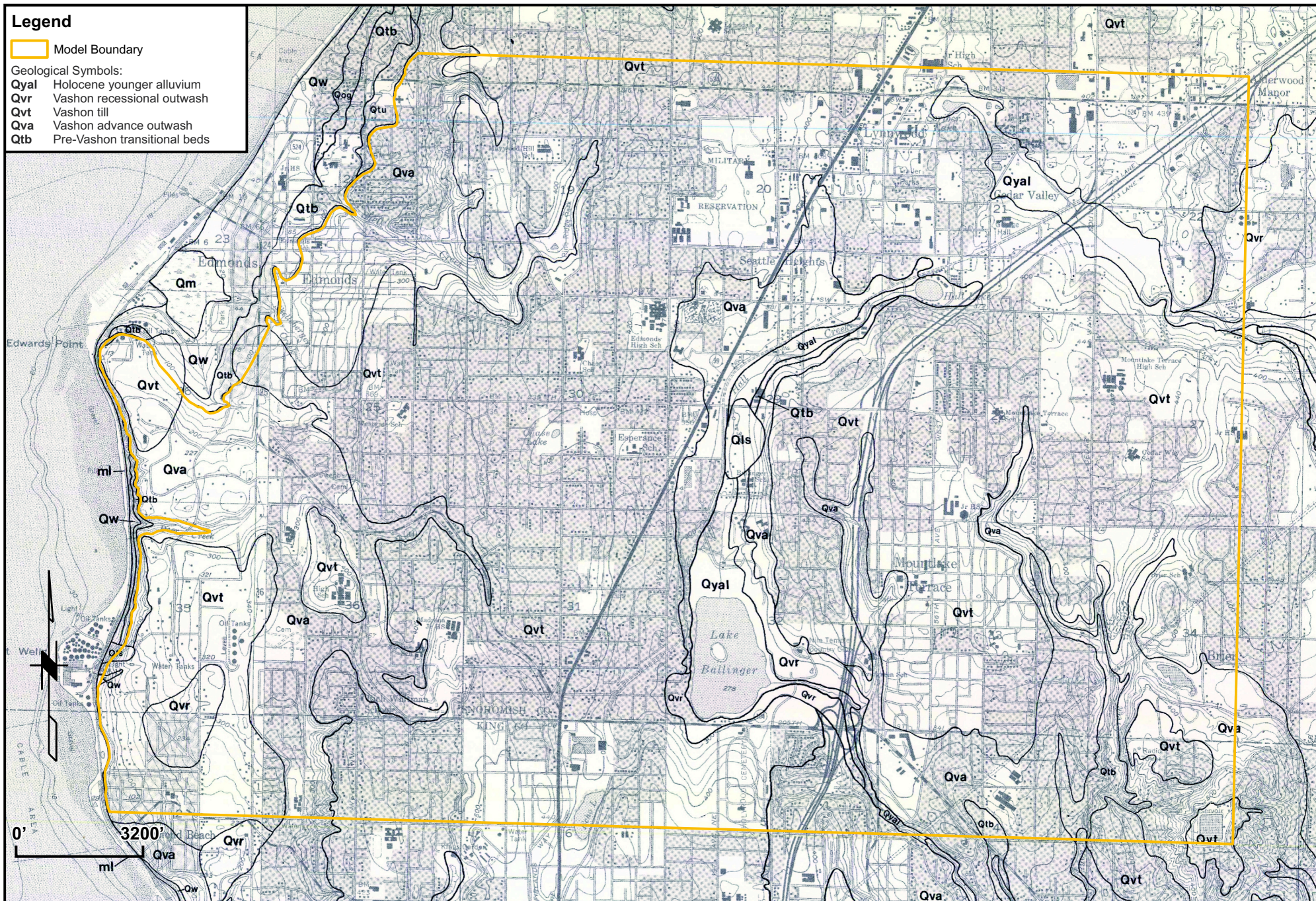


**Legend**

 Model Boundary

**Geological Symbols:**

- Qyal** Holocene younger alluvium
- Qvr** Vashon recessional outwash
- Qvt** Vashon till
- Qva** Vashon advance outwash
- Qtb** Pre-Vashon transitional beds



Note: Geological Map from Minard 1983 USGS Edmonds East and West Quadrangles

PM: MTW  
August 2018  
1686-007A

Snohomish County  
T 27 N/R 3, 4 E  
Scale 1" = 3200'

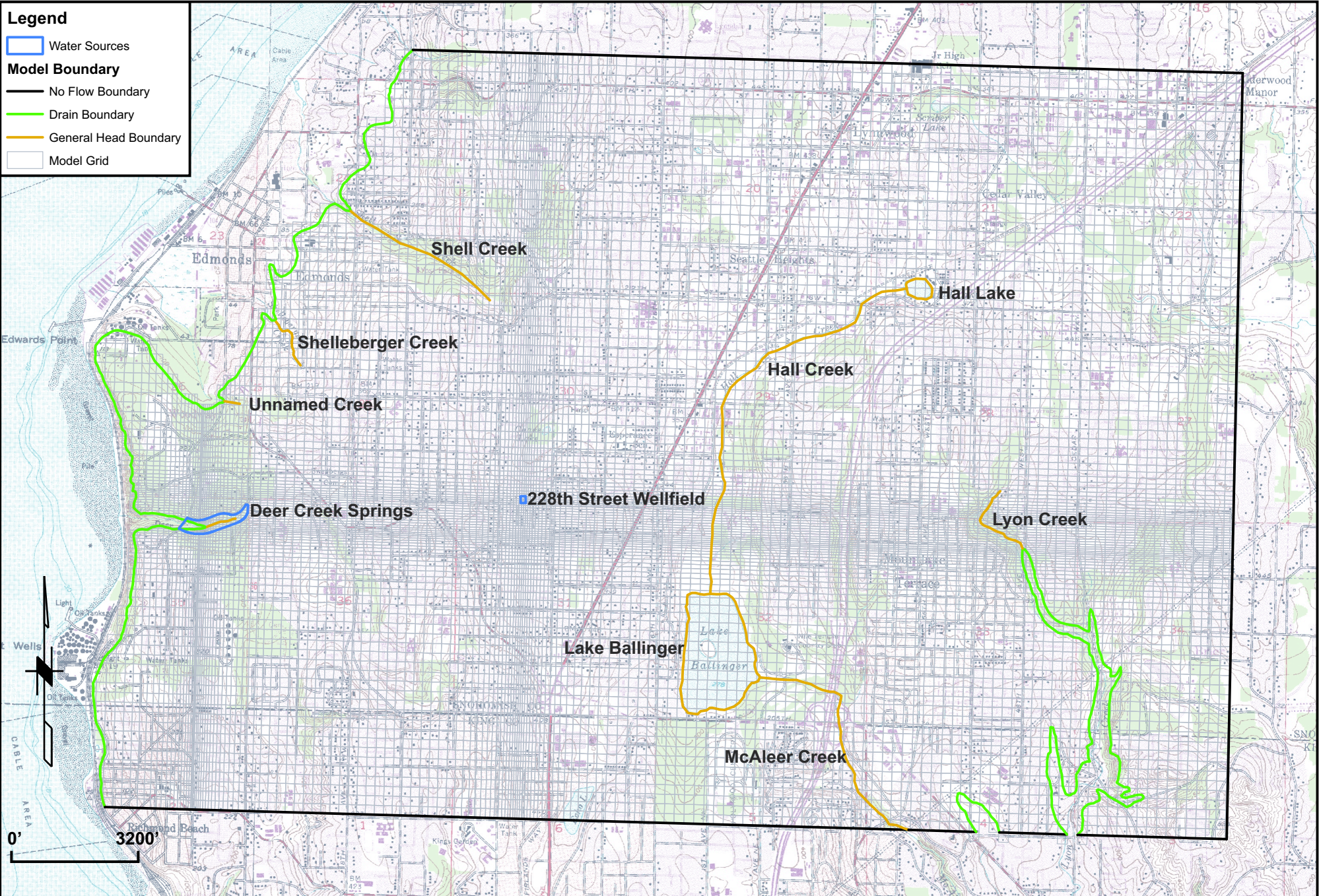
Figure 3  
**Surficial Geology Map**

Olympic View Water and Sewer District: 2018 WHPA





- Legend**
- Water Sources
  - Model Boundary**
  - No Flow Boundary
  - Drain Boundary
  - General Head Boundary
  - Model Grid



Note: Basemap from  
USGS Edmonds  
West and East  
Quadrangles

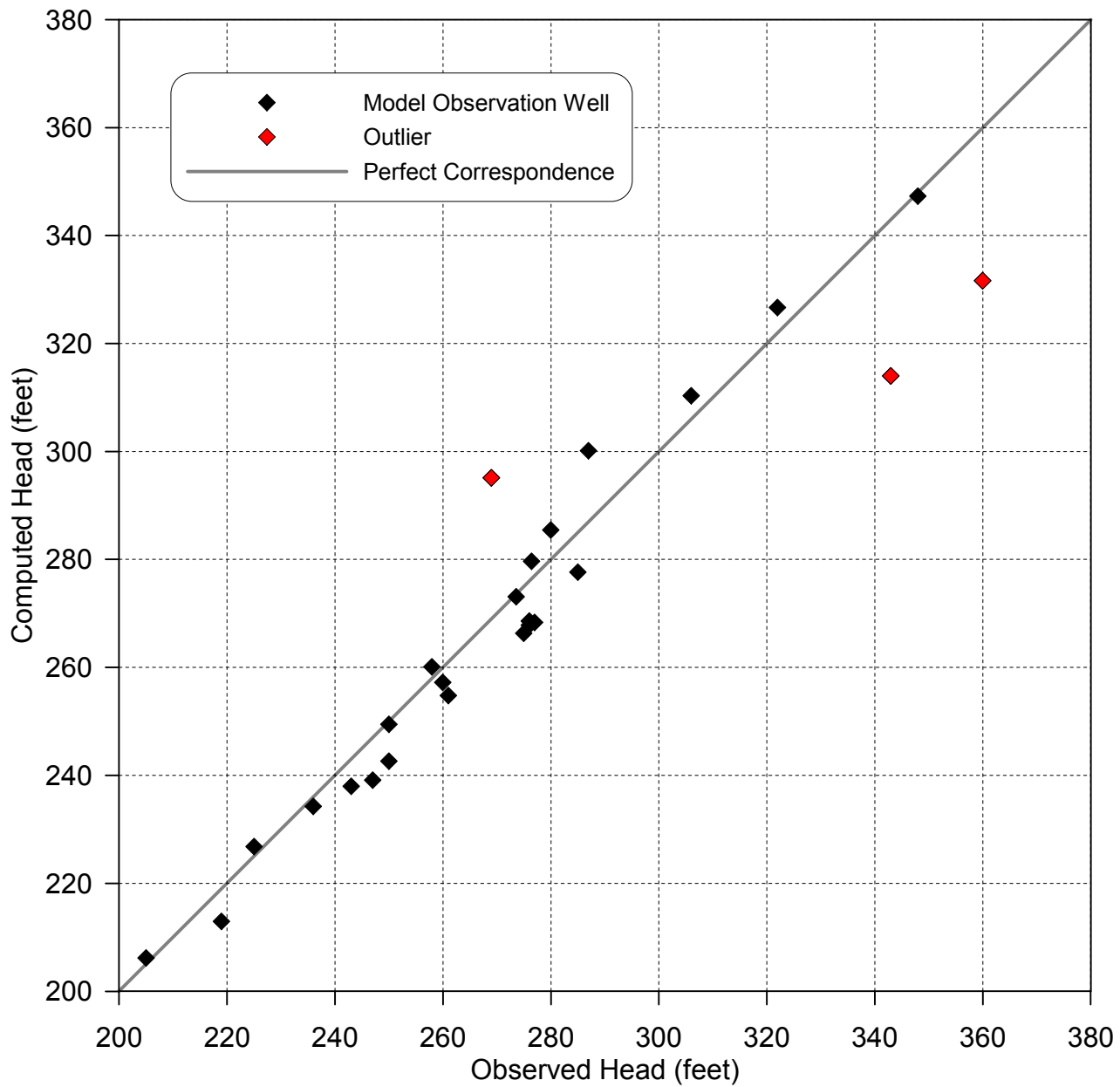
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August 2018  
1686-007A

Snohomish County  
T 27 N/R 3,4 E  
Scale 1" = 3200'

Figure 4





**Model Boundaries**

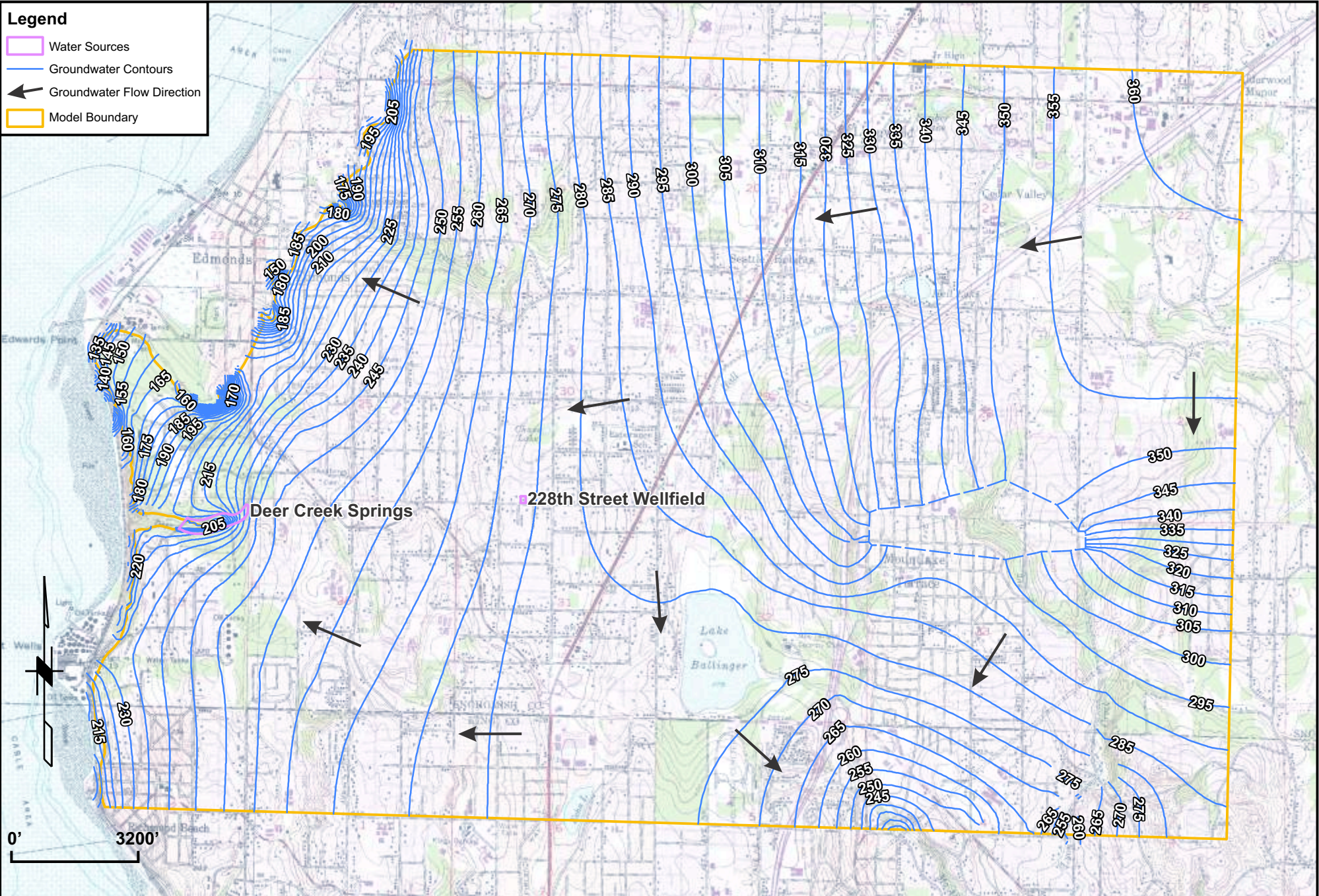






**Legend**

-  Water Sources
-  Groundwater Contours
-  Groundwater Flow Direction
-  Model Boundary



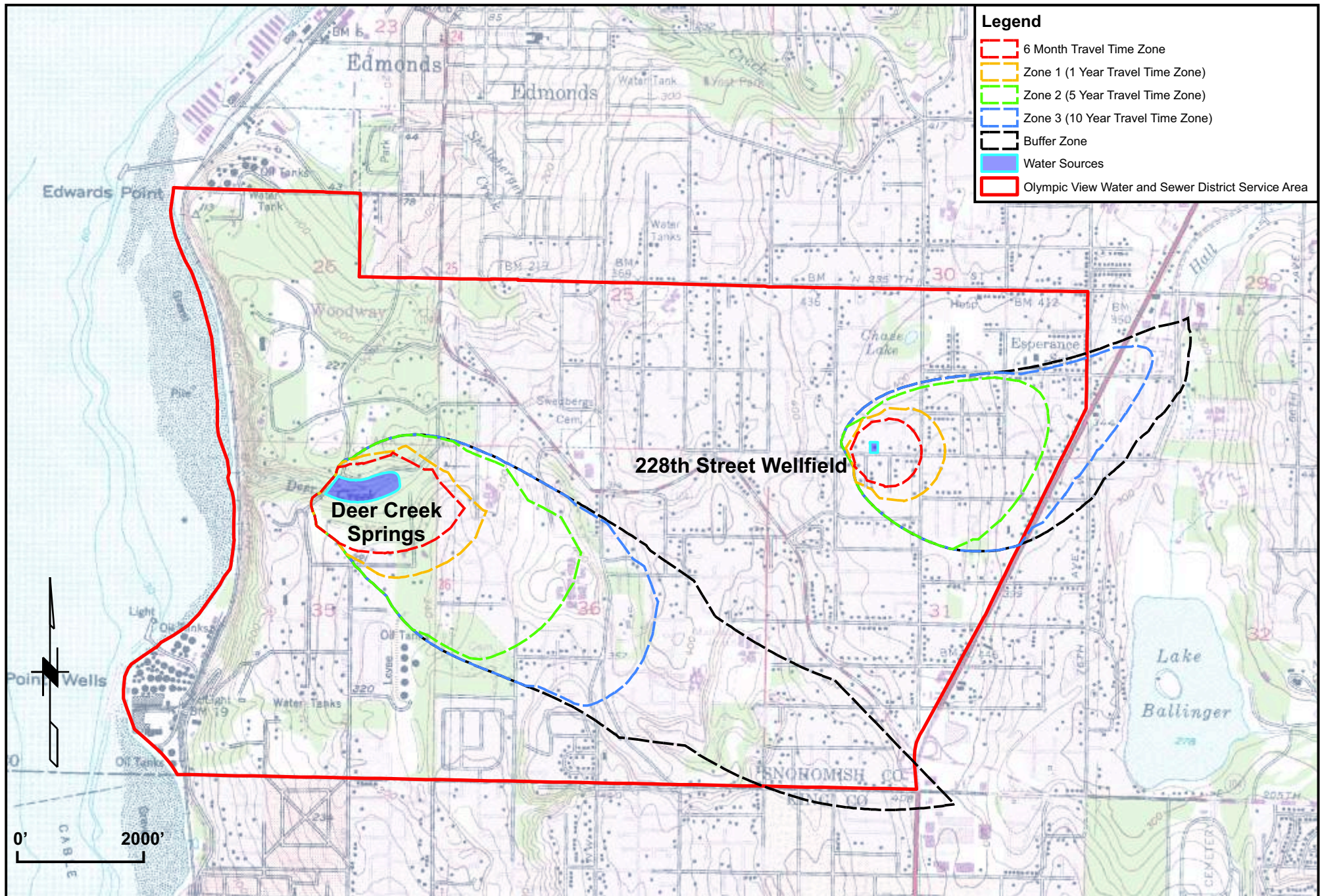
Note: Basemap from  
USGS Edmonds  
West and East  
Quadrangles

PM: MTW  
August 2018  
1686-007A

Snohomish County  
T 27 N/R 3,4 E  
Scale 1" = 3200'

Figure 6  
**Potentiometric Contour Map**  
Olympic View Water and Sewer District: 2018 WHPA





- Legend**
- 6 Month Travel Time Zone
  - Zone 1 (1 Year Travel Time Zone)
  - Zone 2 (5 Year Travel Time Zone)
  - Zone 3 (10 Year Travel Time Zone)
  - Buffer Zone
  - Water Sources
  - Olympic View Water and Sewer District Service Area



Note: Basemap from  
USGS Edmonds  
West and East  
Quadrangles

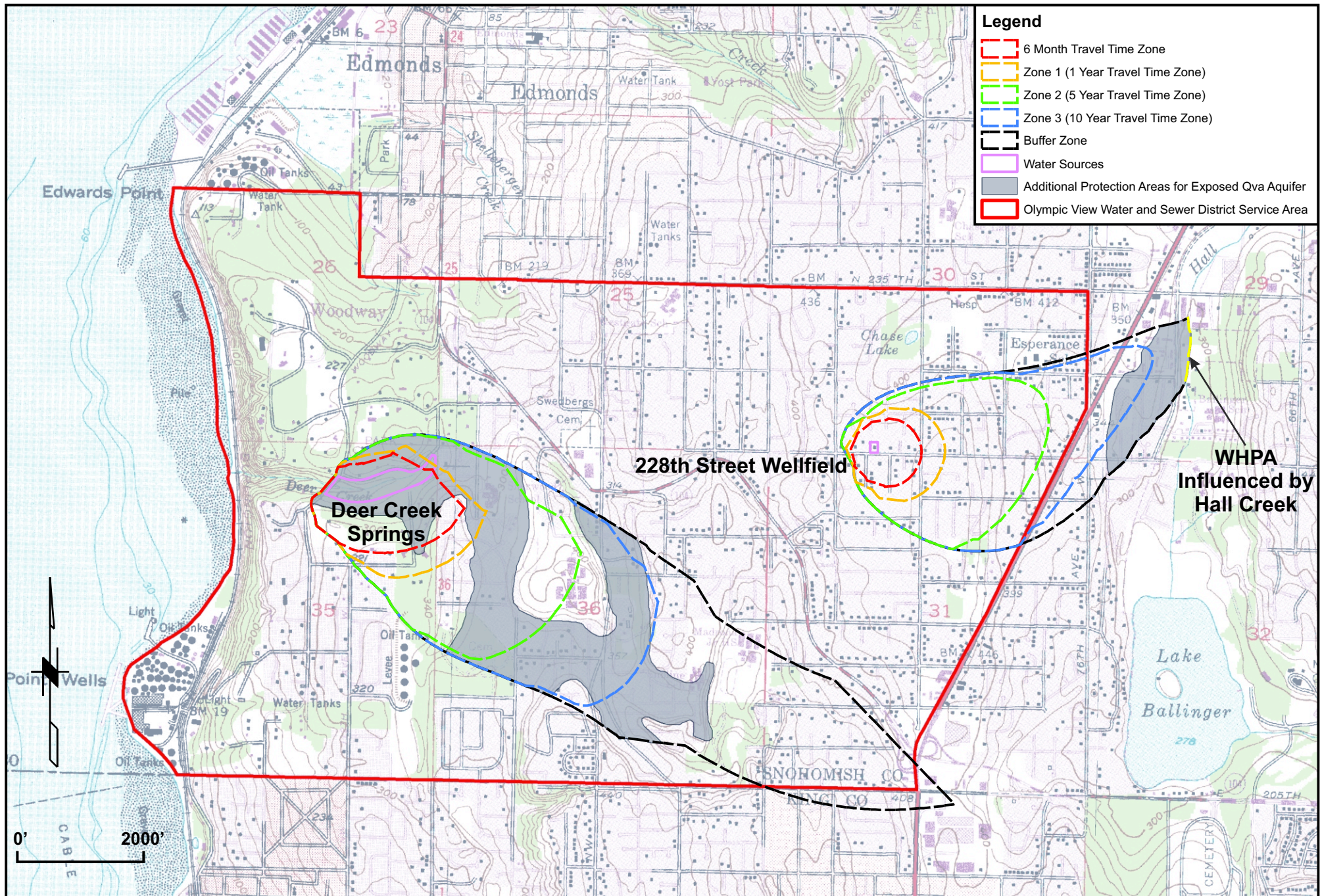
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August 2018  
1686-007A

Snohomish County  
T 27 N/R 3,4 E  
Scale 1" = 2000'

Figure 7  
**Well Head Protection Area Map**  
Olympic View Water and Sewer District: 2018 WHPA







Note: Basemap from USGS Edmonds West and East Quadrangles

PM: MTW August 2018 1686-007A

Snohomish County T 27 N/R 3,4 E Scale 1" = 2000'

Figure 8

**Additional Protection Areas**

Olympic View Water and Sewer District: 2018 WHPA





**Olympic View Water & Sewer District  
Watershed Protection Plan  
Edmonds, Washington**

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**Appendix C  
Watershed Protection Guidelines**

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## **Appendix C**

### **OLYMPIC VIEW WATER AND SEWER DISTRICT WATER SUPPLY PROTECTION GUIDELINES**

It is the intent of this document to provide guidelines for use by the Olympic View Water and Sewer District staff, the agencies having jurisdiction over land use within the District service area, and the general public, as appropriate, for the long-term protection of the District's Deer Creek Watershed, 228<sup>th</sup> Street Wellfield, and public water supply facilities. The following key elements have been identified as critical features of a successful Water Supply Protection Plan.

#### **Regulatory Control**

Although Olympic View does not maintain any authority over land use regulations and requirements, the District is charged with protecting the water resources it relies on to supply public drinking supply within its service area. As these resources are finite and limited, the District may be able to assist agencies with authority through participation in development of land use regulations. The following regulatory measures by land use agencies should be used as a means of minimizing the potential for contamination of, and participation in the long-term protection of, the community water supply:

- Identify the watershed and wellhead protection areas, in all appropriate Critical Area regulations and mapping by adopting the District delineated Wellhead Protection and Watershed Control Areas and associated buffers where possible;
- Prohibit new onsite sewage disposal systems within the watershed and wellhead protection areas;
- Prohibit potential pollutants and any other known sources of contaminants within the watershed and wellhead protection areas.
- Prohibit landfills, including hazardous or dangerous waste, municipal solids, special waste, wood waste, and inert and demolition waste, landfills within the watershed and wellhead protection areas;
- Prohibit mining of metals and hard rock within the watershed and wellhead protection areas;
- Prohibit wood treatment facilities occurring over permeable surfaces (natural or manmade) within the watershed and wellhead protection areas;
- Prohibit facilities that store, process, or dispose of radioactive substances within the watershed and wellhead protection areas;
- Require that oil-based and detergent based waste materials are treated by the sanitary sewer system within the watershed and wellhead protection areas;
- Require storm drainage facilities designed to prevent pollutants from entering groundwater within the watershed and wellhead protection areas in accordance with WAC 173-200 and all other applicable laws and regulations;
- Prohibit the use of underground injection (UIC) wells within the watershed and wellhead protection areas;

- Prohibit the use of reclaimed water for groundwater recharge or other uses which may contaminate drinking water within the watershed or wellhead protection areas;
- Prohibit pervious pavement, tire crumb rubber, PFAS generating, and other pollutant generating surfaces within the watershed and wellhead protection areas;
- Provide early notice and allow the District to review any proposed development or activity that could adversely impact the watershed or wellhead protection areas;
- Require the completion of hydrogeologic impact reports, prepared and submitted by a Washington licensed hydrogeologist, for any proposed development or activities within the watershed or wellhead protection areas;
- Adopt regulations to condition or restrict allowed development in order to prevent adverse impacts to the watershed or wellhead protection areas in accordance with WAC 173-200, RCW 90.48 and all other applicable laws and regulations; and
- Work with adjacent jurisdictions; Snohomish County, City of Edmonds, City of Shoreline, Town of Woodway, Mountlake Terrace, Lynnwood, on regulations to ensure water source quality for those areas outside of the District's service area.

### **Protection Activities**

Long term cooperation with the various land use and emergency response agencies has been identified as another key element in the protection of the water supply. This will likely include the following activities:

1. Consideration of the potential impacts on the watershed in reviewing development proposals. The District may be able to assist in this determination if necessary to evaluate unique or questionable proposals.
2. Notification of any potential threat to the water supply system is also a critical element of the long-term success of this program. Cooperation between all emergency response participants is required to ensure that proper notifications of spills, septic tank failures, or other threats to the water supply are made.
3. Remedial activities and planned mitigation measures associated with the watershed should be coordinated with the District.

### **Program Promotion**

Protection of the water supply is a community responsibility that should be shared by both public agencies and private citizens and businesses. Program promotion through public education is critical to the overall effectiveness of protecting the water supply. The following general activities should be considered as a means of promoting protection of the watershed and water supply.

1. Septic Tank and Drain field Maintenance program promotion. The District is to be notified in the event of a suspected septic tank failure and any surfacing sewage.

2. Use of chemical fertilizers and pesticides/herbicides by parks departments, businesses and residences in the capture zones is discouraged.
3. Protection of surface water bodies and groundwater wells through public awareness and integration of drinking water protection into stormwater and pollution prevention outreach.
4. Oil-based and detergent-based waste materials are to be treated by the sanitary sewer system.





**Olympic View Water & Sewer District  
Watershed Protection Plan  
Edmonds, Washington**

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**Appendix D  
Sample Notification Letters  
Olympic View Water & Sewer District**

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**SAMPLE LETTER**  
**Olympic View Letterhead**

Dear Business Owner:

Olympic View Water and Sewer District has recently completed a Watershed Protection Plan in accordance with the requirements of the State of Washington Department of Health. The Plan has been prepared as a means of protecting the community drinking water supply from contamination and insure that the high quality of water from the District's Deer Creek and 228<sup>th</sup> Street Well field water source is maintained. Although these are not the District's only source of water, it does supply many customers of the District and helps offset higher cost wholesale sources of supply.

The Deer Creek source is located west of 108th Avenue West, between North and South Deer Drives. It is a surface water supply which is fed by springs from the ravine in the watershed area.

The 228<sup>th</sup> Street Well fields consist of two shallow wells, located west of 84<sup>th</sup> Avenue on 228<sup>th</sup>.

A primary goal of the District's watershed protection planning is to raise public awareness regarding the potential human activities which increase the vulnerability of the source of supply. Although the source is considered well protected and secure, there are certain activities which could result in contamination of the source.

To assist in protection of the watershed, the District's consultants have identified a specific area where special precautions are warranted and completed an inventory of potentially hazardous activities based on business types and land use designations. The purpose of this letter is to inform you that the nature of your business indicates that activities which you may be engaged in or materials which you may have stored on site could present a threat to the watershed if proper care and disposal techniques are not employed. Any hazardous material which is spilled onto the ground in this area could eventually reach the watershed area. Some specific sources of contamination which you should be aware of are:

- Accidental spilling of fuel, oil or other chemical products.
- Improper use of septic systems (i.e., paints, cleaners, and/or solvents in the septic system).
- Lack of septic tank maintenance (i.e., periodic pumping).
- Draining of motor oil, gasoline, antifreeze or other similar materials on the ground or into the stormwater system.
- Leaking fuel or chemical storage tanks and/or distribution lines.

Please be aware that Olympic View Water and Sewer District maintains a rigorous water quality testing program to insure the high quality of all drinking water delivered to you. We do, however, appreciate your assistance in the long-term protection of our source of supply. Please contact the District at 425.774.7769 if you have questions regarding the watershed protection plan.

Sincerely,

General Manager

**SAMPLE LETTER**  
**Olympic View Letterhead**

Dear Property Owner:

Olympic View Water and Sewer District has recently completed a Watershed Protection Plan in accordance with the requirements of the State of Washington Department of Health. The Plan has been prepared as a means of protecting the community drinking water supply from contamination and insure that the high quality of water from the District's Deer Creek and 228<sup>th</sup> Street Well field water source is maintained. Although these are not the District's only source of water, it does supply many customers of the District and helps offset higher cost wholesale sources of supply.

The Deer Creek source is located west of 108th Avenue West, between North and South Deer Drives. It is a surface water supply which is fed by springs from the ravine in the watershed area.

The 228<sup>th</sup> Street Well fields consist of two shallow wells, located west of 84<sup>th</sup> Avenue on 228<sup>th</sup>.

A primary goal of the district's watershed protection planning is to raise public awareness regarding the potential human activities which increase the vulnerability of the source of supply. Although the source is considered well protected and secure, there are certain activities which could result in contamination of the source.

To assist in protection of the watershed, the District's consultants have identified a specific area where special precautions are warranted. The purpose of this letter is to inform you of the proximity of your property, home or business to the watershed protection area. Although any hazardous material which is spilled onto the ground in this area could eventually reach the watershed area, some specific sources of contamination that you should be aware of are:

- Accidental spilling of fuel or oil.
- Improper use of septic systems (i.e., paints, cleaners, and/or solvents in the septic system).
- Lack of septic tank maintenance (i.e., periodic pumping).
- Draining of motor oil, gasoline, antifreeze or other similar materials on the ground or into the stormwater system.
- Leaking fuel or chemical storage tanks and/or distribution lines.

Please be aware that Olympic View Water and Sewer District maintains a rigorous water quality testing program to insure the high quality of all drinking water delivered to you. We do, however, appreciate your assistance in the long-term protection of our source of supply. Please contact the District at 425.774.7769 if you have questions regarding the watershed protection plan.

Sincerely,

General Manager